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Challenges and Approaches to Expanding Learning Opportunities in Africa

Parallel Session 7D

Mathematics, Science, Technologies and Information and Communications Technologies in Post-Primary Education

Survey of ICT and Education In Africa
Volume 2: 53 Country Reports

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SURVEY OF ICT AND EDUCATION IN AFRICA

Volume 2: 53 Country Reports

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Cape Verde
Central African Republic
Chad
Comoros
Republic of Congo
Democratic Republic of Congo
Côte d'Ivoire
Djibouti
Egypt
Equatorial Guinea
Eritrea
Ethiopia
Gabon
The Gambia
Ghana
Guinea
Guinea-Bissau
Kenya
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Liberia
Libya
Madagascar
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Mali
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Survey of ICT and Education in Africa

Volume 2:
53 Country Reports

***info*Dev**

Washington, DC USA

2007

Contents

Report Limitations **i**
Project Background **iii**
Overview - Survey Process - Project Team - Acknowledgements

Country Reports

Please note that individual country reports are presented alphabetically and numbered individually

A • Algeria • Angola

B • Benin • Botswana • Burkina Faso • Burundi

C • Cameroon • Cape Verde • Central African Republic
• Chad • Comoros • Congo, Republic of (Brazzaville)
• Congo, Democratic Republic of the • Côte d'Ivoire

D • Djibouti

E • Egypt • Equatorial Guinea • Eritrea • Ethiopia

G • Gabon • The Gambia • Ghana • Guinea • Guinea-Bissau

K • Kenya

L • Lesotho • Liberia • Libya

M • Madagascar • Malawi • Mali • Mauritania
• Mauritius • Morocco • Mozambique

N • Namibia • Níger • Nigeria

R • Rwanda

S • São Tomé and Príncipe • Senegal • Seychelles • Sierra Leone
• Somalia • South Africa • Sudan • Swaziland

T • Tanzania • Togo • Tunisia

U • Uganda

Z • Zambia • Zimbabwe

Report Limitations

The following limitations should be noted:

- The data presented in the individual *Country Reports* should be regarded as illustrative rather than exhaustive. This survey was not an exercise in primary data collection. The guidelines given to country researchers regarding report length were deliberate in order to ensure a focus on the more salient information and to enable the completion of the project within the established time frame and the available resources.

- ICT use in education is at a particularly dynamic stage in Africa, which means that there are new developments and announcements happening on a daily basis somewhere on the continent. Therefore, **these reports need to be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented in the *Country Reports* may become dated very quickly**.

- It is anticipated that these reports will serve as the building block for an on-line database (in a wiki format) that will be updated collaboratively over time, based on additional research and feedback received through the *info*Dev web site.. It is expected that individual *Country Reports* from the *Survey of ICT and Education in Africa* will be updated in an iterative process over time based on additional research and feedback received through the *info*Dev web site. For more information, and to suggest modifications to individual *Country Reports*, please see www.infodev.org/ict4edu-Africa.

Project Background

Overview

This report synthesises the findings from a survey that was initiated by the Information for Development Program (*info*Dev), a multi-donor partnership housed at the World Bank which investigates issues related to the effective and appropriate use of information and communication technologies (ICTs) in developing countries. The survey was undertaken in response to needs expressed by international donor and development agencies, private sector organisations, governments, and NGOs for a consolidated database of information focused on the following key questions:

- How are ICTs currently being used in the education sector in Africa, and what are the strategies and policies related to this use?
- What are the common challenges and constraints faced by African countries in this area?
- What is actually happening on the ground, and to what extent are donors involved?

A similar survey was completed in 2003-2004 by UNESCO-Bangkok (*Metasurvey on the Use of Technologies in Education in Asia and the Pacific*). It is hoped that this Survey will continue to the building of a global database on ICT and education issues in developing countries, regularly updated with the co-operation of project stakeholders.

More complete background information on this project is available on the *info*Dev web site at http://www.infodev.org/ict4edu-Africa.

The Survey Process

A request for expressions of interest was issued by infoDev in April 2006. The Commonwealth of Learning (COL) was selected from among the respondents to conduct the survey, and the work began in September 2006.The work process was designed as follows:

- The first phase involved an extensive literature search to identify relevant extant information in order to inform the data-gathering process for the preparation of reports. The resulting English language bibliography was posted on the WikiEducator web site (http://www.wikieducator.org/ICT4EdAfrica) established specifically to solicit public feedback on the survey project..
- Researchers prepared reports on each country over a three-month period beginning January 2007. The reports were structured to include:
    - National policies, strategies, and programmes that exist in the country for the use of ICT in education
    - A brief description of the current level and types of ICT infrastructure being used in the various education sectors including primary, secondary, tertiary and non-formal
    - A list of the major initiatives underway
    - Identification and description of the factors that enable and constrain the use of ICT
- Data collection was largely done via desk research, using published sources on the Internet, and through telephone and e-mail discussions with country-based contacts. This was supplemented by the personal knowledge and expertise of the ICT in education environment in the countries surveyed by regional and country researchers.

- The first drafts of all reports were posted on the WikiEducator web site during a public comment period from March – June 2007.
- Prior to the preparation of the final report, drafts of individual country reports and the related *Summary Report* were submitted to an *info*Dev review panel for comment.

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ICT in Education in Algeria

by Amr Hamdy
June 2007

Source: *World Fact Book* [1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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Overview

Algeria is encouraging and fostering the use of ICT to enhance the development process in general and the development of the educational system in particular, paving the road for an ICT policy framework along with an implementation strategy.

The government has placed weight on the development of ICT-related human resources. In light of the globally emerging knowledge and information society, Algeria has formed a committee in charge of defining the elements of an Algerian national information society strategy. It is anticipated that the committee will work on creating synergies among the different sectors in the area of infrastructure, training, and research as well as information systems and ICTs. The committee will identify a national ICT working group, which will be charged with formulating short-, medium-, and long-term action plans for ICT.

Country Profile

Algeria is a gateway between Africa and Europe. It is sometimes called the 'land of the million martyrs', as over a million Algerians were killed in the fight against France for independence, which it eventually achieved in 1962. Algeria has also faced internal unrest and instability caused by Islamic militants. The government is currently pursuing a variety of development programmes to better participate in the increasingly globalized knowledge economy.

The fruits of Tunisia's educational reform process are reflected in growing numbers of children attending school. As is the case in many developing countries, Algeria is experiencing a continuing population shift from rural to urban.

Table 1 provides some selected socio-economic indicators for the country.[2]

Table 1: Socio-economic Indicators: Algeria

Indicator	
Religions	Sunni Muslim (state religion) 99%; Christian and Jewish 1%
Languages	Arabic (official), French, Berber dialects
Population	32.9 million (July 2006 est.)
Population growth rate	1.22% (2006 est.)
Literacy	Male: 78.8% Female: 61% Total population: 70% (2003 est.)
GDP	$92.22 billion (2006 est.)
GDP per capita	$7,700 (2006 est.)
Unemployment rate	15.7% (2006 est.)

The Education System

The Arabian Campus Web site describes the Algeria education system as follows:[3]

> Primary education is mandatory and lasts for nine years (École fondamentale). Secondary education is compulsory and consists of a three-year cycle of study provided in secondary schools and technicums. There are three branches of secondary education: general, specialized, and technical/vocational. Students in general secondary and specialized secondary education study for three years and sit for the Baccalauréat examination. Successful students are awarded the Baccalauréat de l'Enseignement secondaire in one of the various streams offered. The Baccalauréat gives access to higher education but some institutions require it to be of a certain type (science, arts, etc.). The objective of technical and vocational secondary education is to prepare students for active life and industry (technicians and qualified workers). Studies last between one and four years, according to the type of training undertaken and can also lead to higher education.
>
> Higher education is provided by universities, specialized institutes, national institutes of higher education, and teacher training institutes, which fall under the responsibility of the Ministry of Higher Education and Scientific Research, as well as by institutes run by other ministries. The specific degrees awarded are determined by the field of study, not the institution. The Ministry of Higher Education approves the curriculum, which is standardized for each field of study. Algerian institutions also award graduate degrees (Diplômes de Postgraduation) in most fields in which a Licence or DES is awarded.

Table 2 provides a quantitative picture of participation in the system.[4]

Table 2: Selected Education Data

Indicator	2000	2005
Primary school enrolment (% gross)*	107.7	111.8
Primary completion rate (% of relevant age group)	82.5	95.8
Secondary school enrolment (% of gross)*	107.7	83.1
Tertiary school enrolment (% of gross)*	107.7	20.3
Ratio of girls to boys in primary and secondary (%)**	94.4	102.1

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**Ratio of girls to boys is the percentage of girls to boys enrolled at primary and secondary levels in public and private schools.

ICT Policies

The Algerian government has mandated the Ministry of Post and IT to implement and manage the national ICT policy.[5] At the same time the government has also initiated

collaboration with a number of international agencies to enhance the ICT status in the country. In 2002 the World Bank also co-operated with the ministry to develop and implement projects for the creation of the enabling environment and improving access to ICT while making it affordable for all.

Table 3 provides a snapshot of the state of national ICT infrastructure in Algeria.

Table 3: ICT in Algeria[6]

Indicator	
Telephone – main lines in use	2.572 million (2005)
Telephones – mobile cellular	13.661 million (2005)
Radio broadcast stations	AM 25; FM 1; shortwave 8 (1999)
Television broadcast stations	46 (plus 216 repeaters) (1995)
Internet users	1.92 million (2005)

The level of ICT integration is still ongoing and at an early stage. The programme aiming at providing access to ICT through the Computer for Every Home Initiative was launched in 2003.

Some forms of media, such as radio and television, have achieved high penetration rates. Mobile phones are commonplace and the number of Internet users is increasing rapidly due to the number of Internet cafés, shops, and access centres that are available – particularly in urban areas.

In 2000 a regulatory law was passed where the old public institution in charge of national telecom was split into two commercial organisations and two operators emerged: Algeria Poste and Algeria Telecom. The law also created an independent regulatory authority of posts and telecommunication. Currently there are three operators:

- Algerie Telecom (mobile and fixed lines)
- Orascom (Djzzy and Lacom for fixed lines)
- Alwatanya (Nedjma and Internet access with mobile phones)

To facilitate the entry of Algeria into the information society, the following national ICT initiatives have been designed:[7]

- The project of the Ministry of Education to equip all schools with computers by 2005
- The distance education project
- The virtual university project
- The research network to be put in place by the Ministry of Higher Education and Scientific Research

- The health network developed and maintained by the National Health Development Agency (ANDS)
- The Djaweb Internet platform

ICT environment in education

The government is committed to set forth a policy for the integration of ICT within the educational system. The reform of the educational process and inclusion of ICT with a set structure was formally included in the country's formal ICT policy in June 2002 with an allocation of three billion dinar.

The Ministry of Education is working on building the infrastructure for enabling the ICT environment. All secondary schools were equipped with computer labs (15 computers: 10 for students, five for teachers) connected to the Internet through ADSL, and 30% of this foundation had Internet access via cable modem. Half of the middle schools have adopted ICT as an integral part of the educational programme.

In the case of the primary schools, the ICT policy remains limited to the administrative process and teacher training. The existence of computer labs at primary schools remains subject to local contributions and donations by parents and community members.

All universities have computer labs and Internet access for faculty, students, and administration in addition to the availability of digital libraries. Each university has its own ICT policy to accelerate the educational process and offer better learning opportunities in virtual universities and with distance and open learning.

Within the framework of enhancing the level of ICT penetration and usage in education, the government has signed a number of agreements with international organisations. For example, UNESCO is undertaking a number of initiatives for the proper integration of ICT in the Algerian education system, and the Japanese government has provided funding for teacher-training programmes totaling to USD$750,000.

There are a number of initiatives that have been adopted in an attempt to improve the quality of teaching and learning. The related strategies, under the heading of e-learning, were set forth to:

- Promote the development of e-learning resources
- Facilitate public-private partnerships to mobilise resources in order to support e-learning initiatives
- Promote the development of integrated e-learning curriculum to support ICT in education
- Promote distance education and virtual institutions, particularly in higher education and training
- Promote the establishment of a national ICT centre of excellence
- Provide affordable infrastructure to facilitate dissemination of knowledge and skill through e-learning platforms

- Promote the development of content to address the educational needs of primary, secondary, and tertiary institutions
- Create awareness of the opportunities offered by ICT as an educational tool to the education sector
- Facilitate sharing of e-learning resources between institutions
- Integrate e-learning resources with other existing resources

Curriculum and textbooks
In Algeria all education institutions deliver the same ICT curriculum as designed by the Ministry of Education. However the plan is to integrate ICT within the different subject matters to enhance learning and education. It therefore becomes a process of learning through the use of ICT rather then learning about the technology.

Training professionals on teaching and usage of ICT
In Algeria the programme of ICT training for teachers has been limited to basic information, with most receiving 30-60 hours of training. Although 100% of secondary teachers and 60% of middle school teachers received the basic ICT training, this has to date very little impact on the quality or method of delivery of education in the classroom.

Major training components:
- *Basic ICT training*: basic operations, Windows-based software, e-mail, and Internet
- *Intermediate training*: classroom applications, Internet for teaching, and e-mail as a medium for communication and collaboration
- *Advanced training*: development and creation of educational software, on-line classes, telecommunication, e-mailing, development of interactive Web sites, production of multimedia presentations, producing creative work

Current ICT Initiatives and Projects

Algeria has placed considerable emphasis on the importance of developing a national ICT strategy for education and training. The Ministry of Education has taken steps to support the implementation of the strategy either by direct action or through the various institutions and agencies that partners with the ministry, such as UNESCO, the EU, and different UN agencies.

Approximately USD$130 million was allocated for the creation of a technology park at Sidi Abdallah, 30 kilometres from Algiers. The park (or IT City) is foreseen to facilitate Algeria's entry into the information society, and a number of ICT initiatives have been designed:

- **Technopole of Sidi Abdallah** comprises three major technology parks and an industrial park with the aim of providing the space for technology firms and fostering the growth in ICT sector while encouraging local, international, private, and public investment in the field of ICT.

- **Net Enterprise** is a project to support the new ICT companies and ensure their growth and sustainability.
- **Technobridge Incubator** supports research and development in the field of ICT, supports ICT start ups, provides institutional support and development to existing businesses with clear coherent operational and growth visions, and provides support to Institut National des Telecommunications (INT) and the École Centrale de Postes et Telecommunications for renewing curricula on ICT management and cyber entrepreneurship.

Implementing ICT in Education: What Helps and What Hinders?

Table 4 lists the core factors and provides a summary of the current stage of development in Algeria in terms of enabling or constraining ICT applications in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework	A national ICT policy for educational development was set forth in 2002. The government has adopted ICT in all domains, particularly the education sector, as an integral part of the development process.	The policy for ICT exists, but to be successfully implemented it needs strong infrastructure and resources. Vast areas of Algeria are still lagging behind in basic needs.
Infrastructure and access		Algeria faces problems of poor infrastructure and connectivity issues.
Availability of appropriate learning materials	The development and provision of tools and learning material are at the heart of the policy of ICT for educational development.	There are not enough appropriate learning materials.
Rural/urban divisions	A major concern of the national ICT policy is provision of access and connectivity to all areas of the country.	Few schools and even fewer universities and higher institutions are available in rural communities.
Gender equity	A number of development projects, especially non-formal education programmes, are directed towards females being part of the underserved population.	In general, the level of illiteracy is higher among females and this is reflected in their access to ICT as well as training and skills.
Human resource development		The multilingual base in Algeria poses a major hurdle to unifying or implementing programmes at a large scale. Professional development

		programmes and teacher training is still limited to basic ICT training with no connection or relevance to integration into the educational process. Professional development and ICT programmes lack connection with content and curriculum development in a manner that allows for proper implementation of reform. The disconnection among the different development programmes impedes proper impact and progress.
Sustainability	The political arena has stabilised somewhat in Algeria, thus setting the grounds for proper implementation of the development programmes and allowing for a more sustained reform effort. The political stability leading into economic reform allows for attracting investment and support locally and internationally.	Several projects and initiatives have been underway, but due to the obstacles posed by the political unrest, many of them have been discontinued.

Notes

1 The World Fact Book https://www.cia.gov/cia/publications/factbook/
2 Ibid.
3 Study in Algeria-Education System. Arabian Campus;
http://www.arabiancampus.com/studyinalgeria/edusys.htm
4 World Development Indicators 2006. The World Bank.
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7 Contribution de l'Algérie à la réunion préparatoire africaine du Sommet mondial de la Société de l'information, Bamako, du 28 au 30 mai 2002

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ICT in Education in Angola

by Shafika Isaacs
April 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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Overview

Three decades of civil war have decimated the country's infrastructure and education system with large sections of the population still in dire straits, and high numbers of school-age children are out of school. Amid these challenges, the government has established a National Commission on Information Technology, now called the National IT Agency, which has been given the task of developing a national ICT policy. There are a few programmes and projects specifically on ICTs in education in the country, although these are largely small-scale, short-term initiatives.

Country Profile

Angola was ravaged for three decades up until 2002. During this prolonged period of civil war, over 330,000 Angolans fled to neighbouring countries, and many more were displaced within Angola. The war involved widespread destruction of infrastructure, and land mines now cover much of the land. Tension remains high in the oil-rich Cabinda Province, which has struggled for independence from Angola since the mid-1970s.

According to the IMF, the Angolan economy grew by 14.7% in 2005 (compared to 4.6% for other countries in sub-Saharan Africa) mainly due to increased oil production and diamond exports. Angola is the second-largest producer of oil in sub-Saharan Africa, and the recent rise of oil prices may push GDP growth as high as 26% in 2006. Despite good economic potential, Angola remains plagued by poverty and poor education.

Four years of peace have re-opened Angola to international lending, enabling the government to invest in social services. Three million refugees, primarily women and children, have returned to their homes in Angola since the end of the civil war in 2002. Most have resettled in isolated and heavily damaged provinces, taxing local resources. Unexploded mines left over from the war are a serious threat to safety and prevent agricultural renewal in some parts of the country.

Table 1 provides some selected socio-economic indicators for Angola.[2]

Table 1: Socio-economic Indicators: Angola

Indicator	
Population	15.9 million (2005)
Languages	Official language: Portuguese Local languages: Kikongo, Chokwe, Mbundu, Kwanyama.
Economic activity 2005 (% of GDP)	Agriculture: 7.9% Industry: 65.8% Services: 26.4%
Human Development Index	161 (out of 177 countries) (2004)
Per capita gross national income (US dollars)	$930 (2004); $1350 (2005)

Education System

The civil war has exacted a toll on the education system in Angola. Primary education lasts eight years in a 4-2-2 cycle. School-going age is generally six years, but may also be later. The first four years are compulsory. Secondary education offers a choice of either general or vocational education. General education lasts for three years from the age of 14, while vocational education lasts for four years from the age of 14.[3] There are also two-to three-year specialised pre-university courses running in parallel.

Angola has one state university, the University of Angola. The rector is appointed by the president of the Republic and the directors of faculties and schools are appointed by the Minister of Education on the rector's recommendation. Angola also has a private institution, the Universidade Católica de Angola (Catholic University of Angola) which was established more recently.

Teacher education takes place in various teacher-training institutes. Primary school teachers are trained for two years in primary teacher training centres for first-level primary and in Institutos Medios Normales (IMN) where studies last for four years. Teachers for the first cycle of secondary education are trained in teacher-training schools. There are also physical education schools. Second-cycle secondary school teachers are trained at the Instituto Superior de Ciências de Educação (ISCED) of the University of Angola. Higher education teachers are trained at the university.

ISCED also offers distance education programmes to upgrade unqualified teachers. Teachers can also follow distance education courses to upgrade their professional training.[4]

Table 2 provides a quantitative perspective of some selected system indicators.[5]

Table 2: Selected Education Data

Indicator	
Primary enrolment (% gross)*	64.3 (2000)
Secondary in Education (% gross)*	14.7 (2000)
Tertiary enrolment (% gross)	0.8 (2004)
Gender parity index (GPI)**	0.66 at university

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**GPI = gross enrolment ratio (GER) of females, divided by the GER of males and indicates the level of access by females to education compared to males. A GPI of 0.66 suggest there is limited gender parity at universities.

Primary and secondary enrolment ratios are low. There are very few secondary schools in Angola – only about 70. Millions of children do not attend school for reasons ranging from poor water and sanitation to inability to pay school fees. Schools are plagued by

overcrowded or multi-age classrooms, teacher shortages, and inadequate learning materials and infrastructure. While school enrolment rates increased slightly in 2005, the country faces the huge challenge of raising the number of children in primary school from an estimated 2.1 million in 2003 to 5 million by 2015 to achieve universal primary education – while keeping up with the rapid growth of the school-age population.

HIV/AIDS prevalence rates are low in Angola relative to neighbouring countries in Africa, but so is awareness of how the disease is spread. Even teachers remain largely uninformed. The government has made fighting HIV/AIDS a national priority, setting up agencies to provide counselling and testing and to teach prevention techniques. The nationwide Defend Life, Learn About AIDS campaign trained 9,500 teachers and distributed educational manuals to 600,000 students, informing them about the risks of AIDS and other sexually transmitted infections.

Infrastructure

Angola's infrastructure has been decimated by the civil war. Until 2002 there were a total of 90 000 fixed lines, mainly in Luanda and urban areas. The government is trying to rectify the lack of infrastructure by introducing competition to the state owned mobile provider in 2001 and the introduction of four fixed line operators. Since the licensing of mobile operators in 2000, the country has grown from 20 000 users (on the incumbent's network) to over 150 000.[6]

Table 3 provides a snapshot of the state of national ICT infrastructure in Angola.[7]

Table 3: ICT in Angola

Indicator	
Fixed-line subscribers	94,3000 (2005)
Mobile subscribers	1.094 million (2005)
Internet users (per 1,000 people)	172.0 (2004)
Television broadcast stations	6 (2000)
Radio stations	AM 21; FM 6; shortwave 7 (2000)

The liberalisation of the telecom sector began in 2001 with the licensing of a second GSM operator to compete with the national mobile operator. In July 2002 four new competitive fixed-line operators were licensed to compete with the national monopoly operator, using third-generation (3G) wireless technologies and WiMAX to provide advanced services. This sector will now become one of the most competitive and liberalised in SADC, resulting in a rapid investment in communications services and benefits to society at large. This should encourage costs to fall and service take-up to increase rapidly.[8] Mobile market penetration is also still relatively low at around 14%, despite rapid growth since the introduction of competition in 2001. A third mobile licence was expected in 2006[9].

ICT Policies

Angola does not have a dedicated ICT in education policy. However, the government created the National Commission for Information Technology in 2002. The commission's first task was to elaborate a plan for the development of ICT called the Strategy for the Development of Information Technology 2000–2010. In the strategy, the National Commission argues that it is necessary to "set out the whole problem that implicates the massive introduction of information technology," a situation that will affect the whole economic and social structure of Angola."[10]

The commission has also created an excellence center, CENAPATI, to implement the projects in the plan and to take on responsibility for the academic and scientific backbone. Considering the private sector enterprises as essential partners, the commission held a meeting in July 2002 in Luanda with several business agents and settled on collaboration schemes with them for the next years. The commission, through CENAPATI, is conducting projects in e-government and establishing telecentres.[11]

In 2006, the government announced the establishment of a new information technology agency to replace the National Commission. The new institution will try to create places of quality for the use of information technologies that will be the model of analysis and reproduction.

Current ICT Initiatives and Projects

A number of humanitarian initiatives have been under way over the past few years to reconstruct Angolan economy and society. In 2002 it was estimated that there were just over 300 NGOs, aid agencies, and CBOs active in Angola working to avert a potential humanitarian disaster of famine.[12]

According to the International Development Research Centre (IDRC), an estimated 8,000 NGO workers and volunteers are engaged in social rebuilding and food distribution activities in more than 20 centres around the country, representing an enormous workforce that requires the latest in communications technology. Inmarsat Mini-MSAT phones, ham radio, HF backbone networks, VSAT stations, e-mail, and the humble long-distance telephone line have been utilised to support these efforts. The preferred mode of communicating with field staff is e-mail . E-mail is also being carried over SAT-phones, HF and ham radio equipment, and slow-speed dial-up lines.

Programmes and projects aimed at reconstructing Angola's education system are largely supported by UN development agencies such as UNICEF, UNESCO, and UNDP as well as organisations such as Save the Children. Some of these broad education projects incorporate specific references to ICTs, albeit in a limited fashion. They include the UNICEF-supported Quality Primary Education Project which incorporates the establishment of an EMIS system, as well as the recently announced centre for the study of science supported by Japanese co-operation, announced by the Angolan Deputy Ministry of Education.[13] Similarly UNESCO has committed to support teacher development in Angola which will incorporate distance education programmes.[14]

Some of the major initiatives related to ICTs in Education are listed below.

AngoNet
The AngoNet project was initiated in Luanda in 1989. For a number of years AngoNet provided Angola's only public access to international electronic networks by e-mail through non-profit APC servers in Europe and Southern Africa.

With the emergence of commercial Internet service providers (ISPs) in the late 1990s in Angola, AngoNet dedicated itself to providing a non-profit network service for organisations and individuals working in social and economic development and humanitarian assistance programmes. AngoNet is a project supported by Development Workshop and funded by UNDP. It aims to increase the capacity of non-profit, civic, and development organisations working in Angola through improved communications and information exchange. Its partners include:

- Development Workshop
- Church Action in Angola
- Christian Aid
- Dutch Institute for Southern Africa
- One World Action
- CONGA Comité das Organizações Não-Governamentais Angolanas
- Programa das Nações Unidas para o Desenvolvimento Sustentável-UTCAH
- Unidade Técnica de Coordenação de Ajuda Humanitária
- Usuários da AngoNet, Rede de APC (rede internacional de ONGs)

Its regional networks include Sangonet in South Africa, MANGO in Zimbabwe, Ebonet, which is an Angolan ISP, SARDC Centro de Documentação Regional de Africa Austral, AIA Africa Information Afrique, and Cronica Informativa sobre a Africa Austral.

Specific services offered by AngoNet include Internet connectivity provision, Web-hosting, Web projects based on created templates and support for telecentres in Luanda, Huambo, and Malange who offer Internet access, photocopying, and document typing services to their communities.

For more information: www.angonet.org

Discovery Channel Global Education Fund
Discovery Channel Global Education Partnership is a non-profit, public, charitable organisation headquartered in the US and dedicated to reaching across the global information divide with the tools and training necessary to extend the power of technology and information to under-resourced communities around the world.

In Angola, the DCGEP partnered with the Angolan Ministry of Education and Culture to reach out to teachers, children, and students of all ages by providing technology and resources that help increase engagement with – and commitment to – the learning

process. These resources include video machines, televisions, and education content that can be used in the classroom to support learning and teaching. The partnership increases teacher effectiveness by equipping instructors with interactive and creative teaching methodologies that employ relevant video programming to complement curricular objectives.

With the support of the Cabinda Gulf Oil Company, the partnership established six learning centres in Cabinda province, and with Chevron's support, 13 learning centres in Bengo and Huambo provinces. These particular provinces experienced heavy fighting during the war. The learning centre project is designed to reach out to vulnerable, internally displaced populations.

Chevron is also supporting the project's expansion into Luanda and Zaire provinces. Historically, Zaire has been one of the least developed and least populated of Angola's 18 provinces.

For more information: http://www.discoveryglobaled.org

Quality Primary Education Project

UNICEF launched a Quality Primary Education Project that forms the core part of their 2005-2008 Education Programme and which focuses on the formal primary education system. This project is designed to be a stepping stone to the achievement of Education for All by 2015.

Support is being provided to establish national goals, strategies, and programmes, with a view to expanding access to child-friendly, effective, and healthy schools. This includes improved teacher-training strategies, mechanisms for supervision, targeted community-involved school construction (including water and sanitation facilities), and standards on hygiene and sanitation for different types of schools, as well as strategies to reach children in isolated areas.

The project also aims to support innovation in primary schools through the development of teaching and learning materials to implement education reform at the national level, as well as specific support for implementation in targeted municipalities.

Greater community involvement in the development, planning, managing, monitoring, and evaluation of education within their communities is promoted, with schools being used as a focal point for change at the community level. The training provided will be focused on participative methodologies to be used in the classroom, as well as gender-sensitivity issues and the promotion of girls' participation.

For more information: http://www.unicef.org/angola/education_1302.html

EMIS
A nationwide rapid school mapping and data collection exercise is being undertaken as a first step in the development of a comprehensive education management information system (EMIS). The data refers to teaching staff, student enrolment, and school infrastructure.

Specific qualitative studies focusing on girls' education and its characteristics in Angola will be undertaken to complement the collection of gender-disaggregated education data through school mapping and the development of an EMIS. In combination with a national seminar on girls' education to be held in the second half of the year, support will be provided to the launch of the United Nations Girls' Education Initiative (UNGEI) in Angola.

UNGEI will result in a girls' education priority action plan and support will be provided to implement selected priority actions for girls' education, including the required capacity building of the gender unit and raising gender awareness throughout the education system and society.

Through the Schools for Africa Initiative, and to address one of the most serious constraints to school attendance, new construction is being conducted in approximately 350 locations, and 1,150 schools are due to receive rehabilitation such as the installation of windows, roofing, and sanitation facilities. Refreshment in-service training is planned for 78,000 teachers to increase the quality of instruction. Attention is also paid to life skills education, including gender sensitivity, hygiene education, prevention of HIV, and mine awareness.

Schlumberger Excellence in Education Development (SEED)
SEED is a global non-profit education programme that serves students aged 10 to 18. SEED has grown out of the spirit of goodwill and close ties between Schlumberger people and the communities where they live and work.

SEED began in 1998 as a way for Schlumberger employees, spouses, and retirees to share their time, experience, and passion for learning and science through a variety of volunteer activities with younger generations of learners.

SEED provides access to technological and knowledge resources for underserved students and teachers in communities where Schlumberger people live and work. These include a range of project-based activities provided through an extensive multilingual Web site, hands-on science education workshops, and collaborative international projects. In these ways, SEED is building a learning community that creates connections among youth around the world and expands their understanding of science. In addition, the SEED Action Fund provides financing to young people for local initiatives addressing sustainability issues in their communities.

SEED plans and carries out activities through different programmes, one of which is the School Network that invites qualified underserved schools to apply for funding that

supports infrastructure (providing technical and financial support to connect underserved educational organisations to the Internet), collaboration (facilitating opportunities to participate in projects, events, and partnerships with other educational organisations), and sustainability (helping schools ensure continuity of the programme after the initial grant).

Through this programme, SEED supported 188 schools serving more than 225,000 children in 37 countries worldwide. In Angola, SEED supported two primary schools where it established along with its West and South Africa GeoMarket, computer rooms including power, light, desks, computers, and a new telephone line for the network connection. Twenty PCs were reconfigured with Portuguese operating systems and would receive similar donations by Schlumberger. It appears that this plan did not materialise.

For more information: http://www.seed.slb.com

SchoolNet Angola

The history of SchoolNet Angola dates back to 1998-1999 with a kick-start process initiated by the Angola Educational Assistance Fund (AEAF). Through this process five schools have been provided with two PCs connected to the Internet in partnership with the local ISP, Ebonet.

The IDRC's Acacia Program has supported the SchoolNet Angola initiative since 2000 to some extent. The initial three schools are still on-line with the university and with a broadband radio connection to the service provider, Ebonet. The services were being used by pupils, although not to the full capacity of the dedicated 256kbps radio links. Ebonet is keen to support further development of this concept and is working with several oil companies that are prepared to offer financial support for system set-up and establishment in other schools. A fourth school was equipped with 20 PCs and Internet access thanks to a donation by Schlumberger, an international oil company.

SchoolNet Africa subsequently assisted with the formal re-establishment of SchoolNet Angola in 2004 in partnership with OSISA. A SchoolNet champion was identified to lead the process in Angola and five schools were initially involved. The programme also included teacher training, supported by Microsoft West East and Central Africa's Partners in Learning Program in collaboration with SchoolNet Africa's Global Teenager Project, and Mtandao Afrika Project. SchoolNet Africa also partnered with Multichoice Africa in support of teacher training in the use of ICTs. A computer installation and training project was considered at a centre in Benguela Province with the support of OSISA and SchoolNet Namibia. These attempts have not been successful. The SchoolNet Angola project is now defunct.

Catholic University of Angola

Angola's first private institution of higher learning, the Catholic University of Angola (CUA), was established in the early 1990s with the support of His Eminence Alexandre Cardinal do Nascimento and the Roman Catholic Church of Angola. The Catholic

University has a Centros Informatica (Information Centre) which is a computer centre available to its students and lecturers. The Catholic University also has a computer engineering department (CED) on its main campus which historically hosted a programme in partnership with Angolan Education Assistance Fund (AEAF) which provided computer skills and continuing education programmes to the community at large. Its goal was also to build capacity among students to conduct ICT-related research.[xv]

Angola also has one state university, the Universidade Angustinho Neto (http://www.uan-angola.org/pgcategory_acerca.php), and an education institution, the Universidade Jean Piaget de Angola. (www.netangola.com/piaget). Both have active Web sites.

For more information: www.ucan.edu

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in Angola in terms of enabling or constraining features in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation	Angola has a national ICT policy, but little reference is made specifically to education. The emphasis is on building schools, acquiring desks, developing teachers, and encouraging more learners to participate in the education system.	Angola does not have a dedicated national policy on ICTs in education.
Advocacy leadership	The Angolan government has a dedicated agency tasked to address its national ICT strategy.	Within education, there are no dedicated structures advocating and promoting ICTs in education and some attempts over the past few years have been aborted as a result.
Gender equity	A sizeable number of education projects supported by UN agencies have earmarked dedicated projects for the advancement of girls and women. The UNICEF-supported EMIS project also aims to track girls' participation in schools.	There are no explicit references to ICT access to promote gender equality or women and girls empowerment.
Infrastructure and	The national ICT infrastructure in	The national ICT infrastructure

access	general appears to be improving with the advent of liberalisation of the ICT market in 2002.	remains very poor in Angola. Access to ICTs in education system remains very low and the scale of projects under way are very small, involving few schools.
Collaborating mechanisms		While there are attempts at collaboration between Ministries of Education and other ministries, the private sector, and civil society institutions, there are no explicit collaborating mechanisms in place.
Human resource capacity	Civil society organisations have created some capacity with the support of AngoNet.	There remains a very limited layer of skilled personnel and champions within the Angolan government and even less in the Ministry of Education.
Fiscal resources		There remains significant dependence on external donor funding for ICT projects including from UN agencies and the private sector.
Learning content	Some projects have developed localised versions of their programmes in Portuguese. These include the SEED and Discovery Channel projects.	Local contextually relevant learning content is currently lacking, although there are attempts by the ministry to try to address this.
Procurement regulations		There are no stated procurement regulations to support greater ICT access.
Attitudes	Some of the leaders in government recognise the importance of ICTs for development and have projected a positive attitude.	Positive attitudes among some champions in government and civil society have not translated into larger-scale, successful ICT programmes in the education sector.

Notes

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2 Ibid.
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ICT in Education in Benin

by Osei Tutu Agyeman
June 2007

Source: *World Fact Book*[1]

Disclaimer Statement

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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It is expected that individual *Country Reports* from the *Survey of ICT and Education in Africa* will be updated in an iterative process over time based on additional research and feedback received through the *info*Dev web site. For more information, and to suggest modifications to individual *Country Reports*, please see www.infodev.org/ict4edu-Africa.

Overview

Benin was the first country in West Africa to connect to the Internet, which it did in 1995. However the weak legal and investment framework stalled progress and development of its ICT sector.

Currently, deployment and integration of ICTs in education are at their lowest from the primary to the tertiary levels. While donor support helped realise some amount of meaningful connectivity to the Internet, the necessary contribution from ministerial and government agency sources that should have contributed to advance the cause failed because they were inept at delivering on their assigned roles.

Connectivity to the SAT-3 submarine cable has made permanent connection to the Internet via ADSL a possibility and has reduced service charges considerably. This may provide a way forward from a seemingly intractable situation.

Country Profile

The Republic of Benin is located between Nigeria and Togo in West Africa. It borders Niger and Burkina Faso in the north and the Bight of Benin in the south. The country has 12 political and administrative regions.

The main exports of Benin are cotton, palm oil, and cocoa. Cotton accounts for 80% of official export receipts. Benin's GDP is 80% agriculture, 12% services, and 8% manufacturing. Thirty-three percent of Benin's population live below the poverty line.[2]

Table 1 provides some selected soci-economic indicators for the country.[3]

Table 1: Socio-economic Indicators: Benin

Indicator	
Population	8.44 million (2005 est.)
Growth rate	2.72% (2006 est.)
GDP (US dollars)	$2.7 billion (2004 est.)
GDP per capita (US dollars)	$300
Human Development Index	165 (out of 177 countries)

The Education System[4]

The school system consists of six years of primary education, which is compulsory, followed by seven years of secondary education made up of two cycles of four and three years. Technical education at the secondary level takes six years, with two cycles of three years each. Tertiary education takes two to four years. Statistics indicate a 48% adult male literate population against 23% female.

The four government ministries responsible for education are:

- The Ministry for Primary and Secondary Education (MEPS)
- The Ministry for Higher Education and Scientific Research (MESRS)
- The Ministry of Technical Teaching and Vocational Training (MEFTP), which is a new ministry responsible for technical and vocational training in all sectors
- The Ministry for Culture, Crafts and Tourism (MCAT)

There are 12 regional education departments[5] and 77 district education offices under the education ministry. These structures give a false impression of a heavily decentralised administration, but the reality is very different.

Table 2 provides a quantitative perspective of some selected system indicators.[6]

Table 2: Selected Education Data

Educational Level	% Enrolment
Primary school enrolment ratio 2000-2005, net, male	93
Primary school enrolment ratio 2000-2005, net, female	72
Percent of primary school entrants reaching Grade 5 (2000-2004)	69
Secondary school enrolment ratio 2000-2005, net, male	23
Secondary school enrolment ratio 2000-2005, net, female	11

Infrastructure

Telephone

The telephone network is more than 80% digital in all the urban areas nationwide. There are plans for the telecom operator, Benin Telecom SA, to extend the network and services to the most remote parts of the country.

The SAT-3 submarine cable landing point in Cotonou, the capital of Benin, is connected to installed transmission equipment and the fibre optic link providing unlimited telephone service, digital television, broadband Internet service and technology convergence among the systems.

The facility has improved voice (fixed and mobile), data, and Internet communication within the country and internationally. Presently the company offers permanent ADSL[7] connectivity between 64 kbps and 2 Mbps to clients. Remote area service is by VSAT installations for voice and data.

Prior to the SAT-3 connectivity, there were 51,000 fixed telephone lines, 55,500 mobile phones in use, and more than 25,000 Internet users in Benin.

Electrification
The country's annual electricity consumption is 275 GWh and its installed capacity is 15 MW. Benin imports 270 GWh to meet national demand with consumption projected to increase by 20% each year for the next 10 years.

Benin has two large dams in operation at Nangbeto and Yeripao. Both of these were built for the dual-purpose of hydro power generation and irrigation.

The two companies that generate and supply electric power in Benin are Société Béninoise d'Energie Electrique (SBEE) and Communaute Electrique du Benin (CEB). CEB is a Togo-Benin joint venture that purchases electrical energy from the Volta River Authority (VRA) hydro facilities in Ghana and transmits it through its link in Lome, Togo, to Benin.

Other joint projects with Togo are the construction of the100 MW Adjaralla dam, and the hydro facilities on the Mono River, in addition to three other planned small-scale hydro-electric projects envisaged to yield a total of 150 MW.

Currently, there are enormous challenges in rural electrification. To date, rural electricity consumption represents only 3% of the national total. Benin, Togo, and Nigeria signed an agreement for the supply of electricity from Nigeria to both countries. The Economic Community of West African States (ECOWAS), through its West Africa Power Pool Project (WAPP)[8] is also in the process of constructing an interconnecting electric power grid for the region that will transport power from excess supply countries to low-energy ones. ECOWAS, along with private sector participation, has nearly completed a gas pipeline connecting Nigeria to Ghana through Benin and Togo, the West Africa Gas Pipeline (WAGP)[9]. WAGP is part of the region's energy system and is to supply natural gas to the three countries.

ICT Policies

Implementation
The Economic Commission for Africa (ECA) and the International Development Research Centre of Canada (IDRC) assisted Benin with funding to develop its National Information and Communication Infrastructure (NICI) Plan which was published in 2005.[10] The plan envisages launching Benin as an active participant in the information society and focuses on the following priority areas

- Business and trade
- Culture and tourism
- Education and training
- Health
- Environment

- Good governance

A new ministry, the Ministry of Communications and Promotion of New Technologies, was handed the co-ordination, control, and management of the new communications environment in accordance with established goals for the ICT sector.

The country projects active and vibrant involvement in an open and interdependent information society by 2025 and has outlined the goals-oriented strategy below:

- Establishment of a favourable environment for the development of ICTs
- Development of the ICT infrastructure
- Creation of a favourable educational environment for the development of ICT human resources
- Development of sectoral ICT applications
- Creation of a framework for collaboration on ICT issues

The plan was preceded by the availability of Internet connection to subscribers in 1996. The Office des Postes et Télécommunications (OPT)**,** now the Benin Telecom SA, was split into two entities:[11] la Poste du Benin S.A. and Benin Telecom S.A. Benin Telecom S.A. is the national carrier, the top-level domain administrator for ".bj" and the entity managing the national Internet Gateway.

The initial connection capacity was increased from 64 kbps to 128 kbps through the USAID's Leland Initiative which heralded the establishment of five Internet service providers (ISPs) and their connection to the OPT facility. OPT similarly operated as an ISP, offering Internet service connection directly to individuals and companies and initially providing dial-up access and leased line and digital leased line connections.

Further, two other ISPs were established: one for national administration by the ministry and the other for the academic community by the project SYFED-REFER of the francophone educational entity AUPELF-UREF. The latter has more than 950 clients, 64% of whom are students; the rest are researchers, lecturers, and civil servants.

Again, two other structures were set up: the Department for the Promotion of ICT[12] in the Ministry of Communications, and the National ICT Agency, which is an economic interest group that is supposed to champion the national ICT cause.

As well, an ICT advisory and promotional structure, the Benin Internet Society (BIS), was established. The aim of BIS is to create favourable conditions for the development and efficient use of Internet, promote Internet services, and serve as advisor to government and other groups operating in the ICT sector in Benin.

ADSL Internet connection is currently available because of Benin Telecom S.A's connection to the SAT-3 submarine cable.

Despite the establishment of these structures, the various government agencies and departments were inept at delivering on their assigned roles. Meanwhile, the private sector that benefited from the business arrangements and opportunities provided by the Internet concentrated on their returns against the promotion of societal progress through technology.

Educational Policy[13]

The educational policy of 1991 articulates the following eight objectives:

- Guaranteeing equal opportunity to all Beninese children between the ages of six and 15
- Improving the quality of education
- Strengthening the institutional framework
- Developing technical and vocational training
- Developing and rationalising non-formal education
- Developing literacy
- Rationalising the different public and private educational structures and scientific research
- Mobilising and managing resources rationally

It is obvious from this list of priorities that the education ministries do not have the policy direction and political will to develop and integrate ICT into education. In fact, ROCARE's (Réseau Ouest et Centre Africain de Recherche en Éducation) report[14] on the application of ICTs in schools indicates that 75% of the educational institutions have not received government aid to introduce ICTs and that without proper management techniques, secondary school students did not benefit from the use of ICTs. The current curricula do not include ICT courses or activities making it imperative for teachers, students, and officials to be trained in the use of ICTs.

Current ICT Initiatives and Projects

Primary level

ICT acquisition and usage costs are generally out of reach of most public primary schools. Some private primary schools have installed equipment, but these schools are not affordable to the majority of the population. Private schools with such facilities are normally confronted with the challenge of settling the monthly connectivity bills, although the advent of ADSL may resolve this problem. Nonetheless, it is rare to find a school providing Internet access to its pupils.

It is in this environment that the GLOBE (Global Learning and Observations to Benefit the Environment) initiative was launched in selected primary and secondary schools in Benin. The initiative is sponsored by the government, USAID/Benin, and the UNHCR.

In February 1999, the GLOBE Train-the-Trainer programme and the USAID mission partnered with four ISPs to deliver training to 115 people in an effort to increase ICT knowledge, awareness, and usage. Currently there are 178 GLOBE-trained teachers in 75 schools including 42 primary schools.

Secondary level

The same challenges facing the primary schools confront the secondary schools. Those public schools that have computers have obtained them through external sources via NGOs and donor programmes and projects.

Project PIIES,[15] (Projet l'Introduction de l'Informatique dans les Etablissements Secondaires), which intended to equip secondary schools, succeeded in installing computers in two secondary schools and some primary teacher-training colleges without connecting them to the Internet.

It is worthy to note that a PC clone sells for 30 times the minimum wage and is equivalent to a teacher's total salary for eight months – a situation that underlies the difficulties in an ailing economy that cannot support generally the provision of computer equipment and Internet connectivity to schools.

The GLOBE initiative has helped 33 secondary schools. Twenty of the primary and secondary schools involved in the programme have computers with teachers and students trained in their usage and maintenance.

Tertiary level[16]

At the tertiary level, before the introduction of ADSL last year, only two institutions provided permanent Internet access to students:

- Campus Numérique Francophone (Francophone Learning Centre) de l'Université d'Abomey-Calavi
- L'Institut National d'Economie (National Economic Institute).

The World Bank furnished the funds for these facilities to which other institutions are connected via telephone lines, and the Beninese authorities provided other infrastructure (buildings and furniture).

Universities[17]

There are three universities in Benin:

- l'Université d'Abomey-Calavi (AUC)
- l'Université de Parakou
- l'Institut Universitaire Technologique de Lokossa

Only l'Université d'Abomey-Calavi is connected to the Internet, but it is not on the fibre optic network linking Cotonou to Parakou. At the l'Université d'Abomey-Calavi, there are four computer laboratories:

- The cyber café of the private ISP, Unitech-Benin, was established in 2003. The Internet connectivity costs were financed by the UNDP in the first year. Plans were made to meet connectivity costs from a services management arrangement in succeeding years. A video-conference facility is to link l'Université de Parakou to this cyber café.
- The Resafad ICT laboratory was set up by l'Ecole Polytechnique d'Abomey-Calavi (EPAC) in 1996. The Internet connectivity for the lab has been defective most of the time since January 2004.
- The Setondji Hall, the nucleus of a planned national research network for distance learning established with assistance from the UNDP, URNET (Réseau universitaire de recherche et d'enseignement à distance) was inaugurated in 2003 with installed capacity for 70 computers, but it currently has only 30 computers and bandwidth connection of 2 Mbps.
- The Francophonie Learning Centre (CNF) of the AUF (Le Campus Numérique Francophone de l'Agence Universitaire de la Francophonie) provides connectivity to several faculties in the AUC and boasts of a training room, a cyber café, and ICT development facilities.

The cyber cafés and ICT labs, particularly CNF, organise ICT courses for students and lecturers. The lecturers receive instruction on the development of Web-learning content and Internet access courses. They then prepare the necessary content before delivering the courses using the facilities at the CNF after which students are allowed to access the resources on their own. The courses covered include mathematics, chemistry, biology, physics, Linux, Web site design, introduction to computers, office systems software usage, files management, Internet access, and access to scientific and technical documents.

CNF's portfolio of e-learning certificated courses includes:

- Designer-manager of Internet services
- Law
- Research in education science
- International rights and the environment
- Internet labels
- ICT and development
- ICTs in education

Lecturers and students alike may subscribe to scientific databases to help with their research, obtain scientific documents and articles, and access Web or local resources. CNF offers resources produced by the Ministère français de l'Education Nationale et de la Recherche Scientifique, among others. The various disciplines are allocated 20 hours of ICT-assisted course instruction per group by the CNF.

Distance learning programmes

ICT has yet to have an impact on open and distance learning (ODL). To date, lecturers produce monographs that are distributed to students nationwide with face-to-face sessions organised periodically. The disciplines covered are an electronic technician's course, civil engineering, mechanical engineering, agriculture, hydro engineering, and environment management. The numbers of students in the various ODL disciplines is tabulated below by year, as shown in Table 3.

Table 3: Enrolment in distance learning programmes

Year	Total	Agricultural Science	Civil Engineering	Hydro Engineering	Electrical Engineering	Mechanical Engineering
2002-03	199	61	86	27	21	4
2003-04	229	66	110	29	15	9

Progressive integration of ICT into the ODL programme is not currently being pursued. The technical training that was offered to the teacher-developers of the course materials by RESAFAD focused on the use of computers to prepare the monographs and course documentation contrary to previous manual methods.

ICT in teacher-training and vocational colleges

Some teacher-training and vocational colleges, as well as the regional education offices, have computer laboratories without Internet connection. Staff and students are taught ICT courses including introduction to computers and office suite applications (e.g., MSWord and MSExcel).

ICT at community level with donor and NGO support

- UNESCO, in collaboration with the Swiss Agency for Cooperation and Development (SDC), has established a community multimedia centre (CMC) in Cotonou for the entire community. The CMC management hopes to help revitalise the marginalised neighbourhood by promoting educational activities and involving the community in small enterprise schemes, micro-credit groups, e-commerce, and distance learning.
- CyberSonghai, a Beninese NGO, has established cyber cafés in Porto Novo, Savalou, and Parakou. Parakou is the most important northern city in Benin. Users pay subscription and user fees.
- ORIDEV, trains and provides Internet access at reduced prices to youth. It organises periodical virtual meetings and Internet workshops for selected students from schools and colleges. These activities are, however, concentrated in the urban areas, particularly in Cotonou. The programmes attract pupils, students, and jobless graduates. Other courses offered by ORIDEV include MS Office applications, computer maintenance, computer networking, and Web site development.

Non-formal education

Adult education focuses on literacy, arithmetic calculations, and the environment. Previous programmes emphasised only literacy without post-training activities. The

revised programme strengthens the communication, information, and family life aspects and is combined with vocational training.

UNICEF and UNFPA are providing assistance to the revised programmes, while UNESCO's contribution centres on rural schools in the Education for All (EFA) programme. Benin partnered with Cooperation Suisse to create the Literacy Support Unit which liaises between civil society and the government's Literacy Service Agency. The unit provides technical assistance to diverse training programmes covering health, hygiene, management, and organisation for rural populations.

Initiatives in the non-formal education sector include:

- Vocational training
- Training of rural youth in rural projects management, training of unschooled girls, etc.
- Literacy and adult education
- Health education
- Education using the media (radio and television)

These programmes were financed through the public, community, and donor assistance schemes set up by the government and supported by USAID, the World Bank, Cooperation Francaise, UNICEF, Japan and the FAO. The government's contribution focused on the construction and rehabilitation of educational infrastructure.

Girls' education

From 1994 to 2003, UNICEF projects (e.g., the Education and Community project and the Social Development Support project) have significantly promoted the education of girls and women generally. The objectives of the projects were to:

- Increase the rate of girls' enrolment from 25% to 40% and reduce the disparity between girls' and boys' enrolment to 10% in all schools in the project zone
- Include a minimum of 30% of girls in the 11- to 15-year age group in all community education projects
- Ensure the training of 50 women per village each year in revenue-generating group projects
- Develop the teaching of children's rights in 150 experimental schools and all schools in the project zone

The government's campaign to reduce the current enrolment disparity of 21% between boys and girls was given a boost when motor-taxi drivers donned T-shirts displaying "All Girls in School" as part of the fee-free education and EFA policies of government. (Women make up 52% of Benin's population.)

Television and radio coverage

Benin has two national and several private television stations: the public radio and television station ORTB, and the private television station LC2 and other private satellite television channels.

There are several FM radio stations. Nine of these are commercial, 17 are either religious or non-commercial, and three are public. In addition Benin has issued 125 community radio licences. Each radio station pays a spectrum fee of 1,000 euros per year.

Because of the inadequate infrastructure, the vast majority of the population in the rural areas obtain national and international news via radio. The low levels of literacy do not make printed media a common information option.

Radio and television are used extensively in community development and social education programmes. The more prevalent themes are health, schooling, environmental protection, agricultural production, husbandry, women's issues, road security, culture, literacy, civic education, and trafficking.

Implementing ICT in Education: What Helps and What Hinders?

Table 4 lists the core factors and provides a summary of the current state of development in Benin in terms of enabling or constraining ICT applications in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features	Risk Factors
ICT deployment	• High-speed Internet connection because of recent connection to SAT3. • Private sector involvement in deployment of Internet services and facilities aiding access to ICT technologies in the general population especially in urban areas.	• Universities financially constrained before the arrival of ADSL. • Private sector ISPs emphasise commercial service against community service. • Low levels of ICT literacy in the general and teaching population.	• Possibility of failure of government or universities to renew or maintain installed facilities. • Inability of government to extend ICT infrastructure due to financial and budgetary constraints.
Non-formal education	• Government and donor support is helping to reach the uneducated. • The weak bridging	• Government budget insufficiency does not permit meaningful	• Future absence of donor support may stall progress because of low government

	of literacy and vocational skills encourage some participation.	assistance to initiatives.	funding.
Gender equity	• Government and society are involved in the campaign for girls' education to converge the girls-to-boy enrolment ratios.	• Traditional daily household demands still take priority over girls' education.	• The bridging of girls' and boys' enrolment ratios is a daunting task in the light of current enrolment statistics.
ICT policy and implementation	• The university and some institutions establish computer laboratories with support from external sources.	• The absence of policy at the ministerial level impedes implementation of ICT.	• The weak legal and investment framework in the telecom sector contributes to the slow progress and development.

Notes

1 The World Factbook 2007. https://www.cia.gov/library/publications/the-world-factbook/geos/bn.html
2 Benin Economy-2007. http://www.theodora.com/wfbcurrent/benin/benin_economy.html
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16 Lohento, K. Société civile et la politique nationale des ntic au Bénin. 2003. Iafric. http://www.iafric.net/benin/articles.htm#societe

17 Usages et bonnes pratiques des technologies et des documents de communication dans l'enseignement à distance et l'apprentissage libre au Bénin, plus particulièrement pour la formation continue des enseignants, ADEA. http://www.adeanet.org/distance/Contrib/C_terret.htm

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ICT in Education in Botswana

by Shafika Isaacs
April 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

The findings, interpretations and conclusions expressed herein are entirely those of the author(s) and do not necessarily reflect the view of *info*Dev, the Donors of *info*Dev, the World Bank and its affiliated organizations, the Board of Executive Directors of the World Bank or the governments they represent. The World Bank cannot guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply on the part of the World Bank any judgment of the legal status of any territory or the endorsement or acceptance of such boundaries.

It is expected that individual *Country Reports* from the *Survey of ICT and Education in Africa* will be updated in an iterative process over time based on additional research and feedback received through the *info*Dev web site. For more information, and to suggest modifications to individual *Country Reports*, please see www.infodev.org/ict4edu-Africa.

Overview

Botswana is a small, dynamic country with visionary leadership particularly in the sector of ICTs in education. Not only does it boast a liberal telecoms policy, its education and national ICT policies are linked to a broader economic vision for the country. Moreover, in practice, Botswana arguably boasts among the highest PC penetration in education institutions in Africa. As well, all junior and senior secondary schools and government tertiary institutions have PC labs. The government has committed financial resources to improve connectivity and to promote the educational use of ICTs.

Country Profile

Botswana is a sparsely populated country with just over 1.6 million people living in an area of 582,000 square kilometres. Since gaining independence in 1966, Botswana has performed exceptionally well economically, scoring one of the world's highest growth rates. It is now a middle-income country with a per capita GDP of $11,200 (2006).

Diamond mining has fuelled much of the expansion and currently accounts for more than one-third of the GDP and for 70% to 80% of export earnings. Tourism, financial services, subsistence farming, and cattle raising are other key sectors. On the downside, the government must deal with high rates of unemployment and poverty. Unemployment was officially 23.8% in 2004, but unofficial estimates place it closer to 40%. Botswana has an English-speaking population with an illiteracy rate of about 22.76%. It also has one of the world's highest known rates of HIV/AIDS infection, but also one of Africa's most progressive and comprehensive programmes for dealing with the disease. Early in 2002, Botswana became the first African country to offer free antiretroviral (ARV) therapy to everyone through the public health system.

Table 1 provides some selected socio-economic indicators for Botswana.[2]

Table 1: Socio-economic Indicators: Botswana

Indicator	
Population	1.6 million (2006)
Languages	Official language; English. Other languages: Setswana, Kalanga, Sekgalagadi.
Human Development Index	131 (out of 177 countries) (2006)

The 2002 Index of Economic Freedom, released by the United States-based Heritage Foundation, rates Botswana's economy as the freest in Africa. In both 2001 and 2002 the international credit rating agencies Moody's and Standard & Poor's awarded Botswana the highest investment grade sovereign credit rating in Africa. The country was also rated the least corrupt in Africa (by Transparency International's 2002 corruption perception index) and the top country in Africa in terms of good governance (by the World Economic Forum in 2003).[3]

Botswana is also home to the headquarters of the Southern Africa Development Community (SADC) which is an alliance of 14 countries that exists to meet the region's social, economic,

and political needs, and enables it to speak with a united voice. The effective use of ICTs within SADC is currently under consideration.

The Education System

Botswana's education system comprises seven years of primary education, three years of junior secondary education, and two years of senior secondary education. Each year at the primary level is a Standard, and each secondary level is a Form.

Education in Botswana is free, but not compulsory. The Ministry of Education has authority over all of Botswana's educational structure except the University of Botswana. The structure mirrors that of the United Kingdom: there is universal access to primary and junior secondary school, but a process of academic selectivity reduces entrance to the senior secondary schools and university. However, educational curricula incorporate pre-vocational preparation in the junior and senior secondary schools.

Primary education is the most important stage in the educational system, and the government strives to make it accessible to everyone. It is the joint responsibility of the Ministry of Education and the local government. One central objective of primary education is for children to be literate first in Setswana and then in English. Other goals are for children to become knowledgeable in mathematics and to have a command of science and social studies. From 1991 to 1997 the number of students completing the primary level and entering junior secondary increased from 65.0% to 98.5%.[4]

The minimum entry age is six years in public schools and five years in private schools, and the maximum entry age in public schools is 10 years. However, flexibility is often exercised to enable pupils in remote areas to have access to primary education.

Botswana, like all other countries in the world, invests heavily in the provision of secondary education. Currently there are 206 junior community secondary schools and 27 senior schools.

Botswana also has six colleges of education, four of which offer the Diploma in Primary Education while two offer the Diploma in Secondary Education. Botswana also has one university.

Table 2 provides a quantitative perspective of some selected system indicators.

Table 2: Selected Education Data

Indicator	
Enrolment in primary education (% gross)*	101 (2004)
Enrolment in secondary education (% gross)*	58 (2004)
Transition to secondary	88 (2003)
Enrolment to tertiary education (% gross)	6 (2004)

Gender Parity Index (GPI)**	1.01 in primary; 1.14 in secondary; 1.15 at university (2004)

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**GPI = gross enrolment ratio (GER) of females, divided by the GER of males and indicates the level of access by females to education compared with males.

Infrastructure

Botswana's ICT infrastructure is very good, but is not fully utilised. Internet usage, for example, stands as low as 5% of the population. There is also considerable disparity in terms of urban and rural access to ICT services. Challenges include the relatively high cost of PCs, the lack of electricity in many rural locations, and high charges for Internet usage. In addition, the Internet needs to be made more relevant to the Batswana, through the development of local on-line content tailored to the needs of the population.

High international bandwidth costs between USD$3,250 (satellite) to more than USD$6,000 (terrestrial) per 1 MB per month. For 128 kbps, BTC leased lines are between five and 20 times more expensive than in Namibia and South Africa.[5]

ICT is still not widely exploited by business in Botswana, although it is used extensively in the retail and mining sectors within foreign-owned companies. Botswana's ICT sector itself is small and generally focused on local market opportunities.

Table 3 provides a snapshot of the state of the national ICT infrastructure.[6]

Table 3: ICT Infrastructure in Botswana

Indicator	
Fixed-line subscribers	69.7 per 1,000 persons (2004)
Mobile subscribers	708 per 1,000 persons
Dial-up subscribers	6,000 (2005)
Broadband subscribers	0 (2004)
Internet users	7.167 (2004)
Television broadcast stations	1
Radio stations	41

Botswana ranks 56th out of 115 countries on the World Economic Forum's network readiness index, ahead of Namibia, Uganda, Mali, Mozambique, and Zimbabwe.

The government is still in the process of liberalising and enhancing regulation of the communications industry in a bid to attract investment as well as encourage innovation and competition. Efforts are being made to reduce communications costs in Botswana, mainly through further liberalisation of the telecommunications industry. This should create more competition and ultimately result in lower tariffs for the consumer.

Botswana has a very small ICT workforce. A CSO labour survey from 1996 put the total size of the workforce in the country at about one-half of one percent of the working population. Of that, only 25% was female.[7]

ICT Policies

Vision 2016

Vision 2016 is a national manifesto of the Botswana government that articulates the long-term economic goals for the country including strategies to meet them. ICT is a key component of the first goal, which is to be an educated and informed nation.

The long-term vision is that Botswana will enter the information age on an equal footing with other nations. The country will seek and acquire the best available information technology and become a regional leader in the production and dissemination of information.

ICT is also a major focus of the country's economic agenda, the National Development Plan 9 (NDP9), and significant investment has recently been made in upgrading Botswana's communications networks to facilitate new technologies. In 2002 Botswana established a government ministry dedicated to ICT, the Ministry of Communications, Science and Technology.

Revised National Policy on Education

A government policy entitled the Revised National Policy on Education, released in 1994, highlighted the need for all learners to be taught computer skills at all levels of school. It also recommended the introduction of computer science as a subject option in senior secondary schools and computer awareness for the three years of junior secondary school. As a result, a new curriculum for computer awareness has been developed and piloted in 11 junior secondary schools. The curriculum aims to equip learners with computer skills that can be applied in all subjects. A strong focus is also placed on tertiary education, with proposals to increase university enrolment.

Maitlamo: National ICT Policy

The Government of Botswana has recently introduced its national ICT policy, called Maitlamo, which provides a roadmap to drive social, economic, cultural, and political transformation through the effective use of ICTs. Maitlamo aims to provide a communications network that meets high international standards and ensure the country has the skills to be an ICT leader. Its key goals are for Botswana to become a sub-Saharan ICT hub, to create an enabling environment for the growth of an ICT industry in the country, and to provide universal service and access to information and communication facilities in the country.

A steering committee for Maitlamo has been set up. In addition, NELSCOM, a National e-learning steering committee has been established to provide a comprehensive report on the strengths and weaknesses of the Botswana's e-learning strategy.

To this effect the following activities are highlighted for implementation:

- Connecting communities programme
- Government on-line
- ThutoNet (see below)
- e-Health Botswana

- ICT and economic diversification
- Connecting Botswana
- Connectivity laws and policies

ThutoNet, the policy on the promotion of e-learning, is a critical component of Maitlamo. Its targets are to:

- Provide all schools with modern PCs and Internet access
- Increase the ratio of PCs to learners to 1:7
- Design and implement an ICT content and curriculum development programme for the primary secondary, vocational, and tertiary sectors
- Design and implement professional development among teachers
- Develop ICT skills programmes for adult and non-formal learners
- Introduce a strong ICT proficiency measurement and skills monitoring programme
- Support e-education research and development
- Secure funding to sustain ICT use in education

December 2010 is the target date for having all schools and libraries with computers and Internet connectivity, for all teachers to have received ICT training, for ICT content to be available at all levels, and for achieving the 1:7 PC-to-learner ratio.

The schools connectivity project is acknowledged as an expensive endeavour. It proposes a 128 kbps Internet connectivity and proposes a central educational network as an extension of the Government Data Network to support Botswana's Education Management Information System. The proposed Computers for Schools programme will:

- Increase the ratio of computers to students in schools, extend its reach to the primary level, and introduce PCs in the classroom to facilitate ICT throughout the curriculum
- Encourage government and private sector organisations to donate surplus computers for use in schools and communities.
- Use recycled PCs to provide an opportunity for on-the-job experience for ICT graduates working in refurbishment centres
- Establish school-based computer repair workshops

A professional development programme will involve training a group of teachers who will serve as ICT managers or coaches in their respective schools. This will be followed by an intensive training programme focused on basic computer use and maintenance, use of the Internet and school network, and basic ICT education. Later phases will broaden the number of teachers who have basic skills to integrate ICTs into all aspects of the curriculum.

There will also be a range of initiatives aimed at training and job creation for those outside the formal education system. JobNet is a project that will co-ordinate existing programmes to create a network of online services and tools aimed at helping employers and job seekers use the Internet for recruitment, career, labour information, and learning.

For more information: www.maitlamo.gov.bw

Current ICT Initiatives and Projects

To date, a host of connectivity and ICT infrastructure projects have been underway. These are outlined in Appendix A, while education-related initiatives are discussed below.

Schools Sector
In the formal schools sector, all junior and senior secondary schools have fully equipped computer laboratories.

Botswana has made a commendable effort to provide resources for its junior secondary schools; however, many schools struggle with their effective use. Computers, while available in most schools, often are not connected to the Internet, precluding their use in cross-curricular instruction. While libraries exist in most schools, they do not have current collections and do not yet operate as vibrant centres of learning.[8]

World Links has played an important role since 2000 in implementing ICTs in Botswana's community junior secondary schools (CJSS's) in partnership with the Ministry of Education. These schools are part of the community in terms of their operations and management. They have a board of governors that lays out policies within which the school operates.

The government has been committed to rolling out 20-PC laboratories including a server and networking to all 205 CJSS's. These labs include air conditioning, network trunking, and a dedicated circuit isolated from the direct mains. By 2002, 51 of the 205 laboratories were equipped with computers (15 by World Links and the rest by the government). All the government-equipped schools have 20 computers with a server and a local area network; the World Links schools do not have the same complement of equipment. Students involved in the World Links programme were also linked to the collaborative projects of the International Education Resources Network (iEARN).

Internet Learning Trust
The Internet Learning Trust, an NGO in the UK, built on the government project by providing initial training and support for teachers in 11 CJSS's identified by the Ministry of Education as suitable pilot models. The project has piloted the use of the Internet for communication and enrichment of curriculum in the schools. Twenty-five more CJSS's were equipped in early 2000, and a project memorandum to equip the remaining 169 CJSS's has been completed.

In the case of senior secondary schools, computer labs have been built and most of them are complete and have the equipment installed. However, even before proper laboratories were built some schools offered on optional course in computer studies as an examinable subject.

Computers are also available at education centres and the Department of Non-formal Education (DFNE) offices. These are used for administrative and educational purposes. Most of the private schools in Botswana are connected.

Talk Back TV on HIV/AIDS[9]
The Talk Back project was a finalist in the Stockholm Challenge Award in 2002. It is a live interactive television programme that forms part of the Teacher Capacity Building for HIV/AIDS Prevention in Botswana. It aims to contribute to breaking down the silence associated with HIV/AIDS in classroom settings, creating opportunity for relevant behavioural

change. It further aims to improve teachers' knowledge and skills on interactive methods and HIV/AIDS through the use of distance education and ICT.

The programme is a 60-minute interactive live broadcast that is repeated twice a week on Botswana Television. Talk Back allows interactivity between viewers and panellists. This has been greatly enhanced through SMS call-ins during the live broadcast. The use of free communication programmes such as Skype and MSN Messenger are being used to improve discussion and participation. The project has installed television sets, VCRs, decoders, and satellite dishes in schools to allow teachers to participate. Further interaction between the programme and the teachers is provided through the country's education centres in the form of in-service workshops and seminars.

The major partners include the Government of Botswana through the Ministry of Finance and Development Planning, the Office of the President (National AIDS Coordinating Agency), the Ministry of Local Government, and the Ministry of Education, which is the implementing institution.

Talk Back TV is produced by Botswana Television. Funding and technical assistance is provided by the United Nations Development Programme (UNDP and UNFIP), the African Comprehensive HIV/AIDS Partnership (ACHAP) of the Bill and Melinda Gates Foundation, and Merck and Co./The Merck Foundation.

Having television in 61% of government-owned educational institutions has provided the infrastructure base for educational television, which has the potential of being used to address development challenges in the areas of environment, drug control, life skills education, and other social problems. The project is expected to be rolled out to involve private educational institutions and the wider community with involvement of community-based and non-governmental organisations.

It is expected that by the end of 2007 values, attitudes, and behaviour of youth and adults will have changes; Botswana's educational institutions will have received equipment that can be used in future educational programmes; educators and media professionals in the educational use of television and other ICT media will have had their developed skills; teachers, education managers, and community leaders of Botswana will have been trained to engage students on socio-cultural and gender issues associated with HIV/AIDS; and educators will be more aware of the effects of the epidemic on their own capacity to function and of the opportunity to take responsibility for the well-being of themselves and others.

Media Centre - Mochudi

The Mochudi Media Centre is a national multimedia centre established to provide ongoing in-service training and support, as well as general media support services to teachers and other educational practitioners. Managed by the Ministry of Education, it is the in-service centre for training in video, television, ICT, multimedia programme development, new technologies, and research and development. The functions of the Media Centre include:

- Formulating training strategies required to develop local capacity necessary for a dynamic and innovative educational media programme
- Networking all media and ICT services between education and other sectors to ensure comprehensive development of ICT in the country

- Providing professional development programmes and support to users and producers of educational media and training through strengthening, focusing, and extending training in ways that combine education and media skills

The programme includes:

- A television studio that is available for the production of education television programmes and professional development of teachers to enhance capacity-building as well as the production of videos to be used for teaching and learning
- An audio-visual van fitted with cameras and editing facilities and used as a field production vehicle
- Computer facilities for training teachers and other educators in computer literacy with emphasis on collaborative learning approaches

The audio-visual training room caters for the training of education practitioners in the effective use of audio-visuals and educational media in teaching and learning. This includes various aspects of multimedia production strategies to enhance instructional delivery.

Higher Education Sector

All government tertiary learning institutions in Botswana are well equipped with Internet-enabled computers. The University of Botswana is the most advanced institution in the country with six faculties: business, education, engineering and technology, humanities, science, and social science. It offers a two-year diploma in computing studies and a four-year degree in computer science.

Botswana is planning to establish a second university that will also be centred on the development of ICT related skills and expertise. World leading programmes in science, technology, engineering, and business will be at the core of the university's subject offerings.

Botswana is also home to the National Institute of Information Technology which offers diplomas and certificates in computing studies.

Informal Sector

Botswana College of Distance and Open Learning

The adoption of the Revised National Policy of Education led to the creation of Botswana College of Distance and Open Learning (BOCODOL) in 1998, a semi-autonomous and statutory organisation set up through an act of Parliament. BOCODOL and the Centre for Continuing Education of the University of Botswana are now the lead agencies in distance education and open learning. BOCODOL, with its headquarters at Gaborone, has five regional centres through which it offers school equivalency and vocational and management courses. It also has 50 study centres with an enrolment of around 21,000 in 2005. It is currently running an e-mail pilot project to improve learner support services through the use of the Internet and related services. It also plans to provide basic computer training and Internet-based e-mail basics and other software programmes to open and distance learners. BOCODOL is also considering piloting the International Computer Driver's Licence course in its strategies to become a fully-fledged open and distance institute.

Part of the roll-out strategy involves the purchase of the Promethean Interactive White Board hardware and software to teach practical subjects. The approach addresses queries involving teaching science subject practicals through simulations. BOCODOL plans to convert print-based

instructional materials to interactive CD-Roms, explore the development of Web-based instructional materials, procure video instructional materials to supplement print, and venture into in-house production of educational videos once the construction of studio facilities is complete.

To boost BOCODOL's efforts, the Ministry of Education, in conjunction with the Department of Information Technology and the Ministry of Communications, Science and Technology (MCST), is working on the development and plans to establish an Education Data Network (EDN) that will provide educational institutions with access to Internet, e-mail, and Web-based teaching and learning throughout the country. This is already being piloted in four institutions through the provision of broadband access to the Internet through Botswana Television transponders. The ideal is based on gaining discounted rates for bona fide educational purposes and creating a separate super-fast EDN highway for educational use.

MCST is also planning to link Botswana to the western continental undersea telecommunications cable that will provide high bandwidth to users. BOCODOL stands to gain from this infrastructure through its five regional offices strategically located in Gaborone, Kang, Francistown, Palapye, and Maun.

The physical infrastructure for the support of ODL and e-learning includes 50 community study centres located within existing secondary schools in the five BOCODOL regions. The 12 education centres include the Mochudi Media, Tlokweng National Resource, and Learning Resources Centres in the Colleges of Education, secondary schools, computer labs, and the campuses and sites of the University of Botswana.[10]

Southern Africa Open School Consortium

A number of countries in southern Africa have established new institutions or divisions within existing institutions to provide secondary education through distance learning. These institutions focus on preparing learners to secure sustainable livelihoods by improving their academic qualifications and by providing training to create and maintain income-generating opportunities. To share the emerging base of experience in open schooling, the Commonwealth of Learning (COL) supported the establishment of an open schools consortium to focus on developing academic and vocational education programmes and materials. In July 2006, representatives from institutions and ministries offering education through distance learning in seven African countries met in Gaborone, Botswana, to form the Southern African Development Community (SADC) Open Schooling Consortium. Hosted by the SADC Centre for Distance Education (SADC-CDE), the meeting was organised and supported by COL and Mindset Network, a non-profit South African organisation. The participants agreed to form the consortium, which will be housed by SADC-CDE. Mindset will co-ordinate fundraising and project implementation activities in collaboration with the other members.

The vision of the SADC Open Schooling Consortium is to provide a vehicle to initiate, design, and implement collaborative projects to develop high-quality distance education programmes (and accompanying materials drawing on different media as appropriate) at the secondary level. The programmes will be designed to secure sustainable livelihoods. The consortium will facilitate peer-to-peer networking among practitioners working to deliver school-level education through open and distance learning. It will also develop proposals, source funding, and organise and manage joint programme and materials development at two key levels:

- Junior secondary: The focus will be on increasing access to quality programmes offered via distance education in order to provide educational opportunities to those large numbers of learners in the region leaving primary education and unable to secure places in the mainstream secondary schooling system.
- Senior secondary (learners aged 16 to 25): The focus will be on designing high-quality programmes that have a strong vocational orientation in order to prepare learners to secure sustainable livelihoods for themselves and their families

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in Botswana in terms of enabling or constraining features in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation	Botswana's general education policy commits government to the introduction of computer science as a subject and to the use of ICTs for learning and teaching. Botswana also has a national ICT policy that incorporates a dedicated section on education with clear, ambitious targets to be reached by the end of 2010.	
Advocacy leadership	Within government there has been dedicated personnel based at its Ministry of Education that attends to all matters relating to ICTs in education.	
Gender equity		There are no explicit references to gender equality or women's empowerment in the national ICT policy.
Infrastructure and access	Botswana has a well-developed ICT infrastructure because of its historical and economic ties with South Africa.	The cost of connectivity remains prohibitive. The government has decided to invest in second-hand PCs which may raise sustainability problems in the future.
Collaborating mechanisms	The national ICT policy is co-ordinated by an established steering committee from government representatives across different ministries including a dedicated e-learning steering committee to oversee e-learning activities.	

Fiscal resources	The Ministry of Education has dedicated financial resources to the rollout of ICTs in school and has sought partnerships with other groups and organisations in support.	
Learning content	The national policy shows commitment to the development of local contextually relevant digital learning content.	While there is a stated commitment to develop local content, not much digital content is available that is aligned specifically to Botswana's national curriculum or that is available in local languages.
Attitudes	The leadership within Botswana's government has demonstrated a very positive attitude to the promotion of ICTs in education. Many of the ICT in education programmes are based at and led from the Ministry of Education.	

Appendix A: Additional Initiatives

National Telecommunications Network Upgrade
The government has committed USS$60 million to rehabilitate and fortify the national telecommunications network. An additional USD$60 million is being mobilised to provide high-capacity international connectivity through undersea cables off the east and west coasts of Africa.

Rural Telecommunications Initiative
At the end of its first phase in 2004, the Rural Telecommunications Initiative brought modern telecommunications, including Internet access, for the first time to 147 villages. When fully implemented, the project will ensure that more than 50% of Batswana living in the remote areas of the country will be provided with basic telecommunications services. This is a major step forward which should stimulate economic activity and improve people's lives.

Community Information at the Touch of a Button
Botswana Technology Centre is piloting a community user-information system to bridge the digital divide between rural and urban dwellers. The system comprises an on-line computer network linking three rural communities to Gaborone. The centres provide rural communities with access to Internet-based information and communication services, as well as local information on health, education, and business. It will be expanded to include basic services such as downloadable application forms for everything from drivers' licences to bank loans. The centres will also provide small business services and offer basic computer awareness lessons. Following the pilot project, the programme will be rolled out to the rest of the country.

VSAT Technology

Botswana Telecommunications Corporation (BTC) launched VSAT technology that, it is hoped, will play a role in bringing services to remote areas through the use of satellite and overcome limitations placed on traditional services by vast distances and difficult terrain. The technology will bring significant benefits to the tourism industry, isolated farming communities, and government and parastatal organisations.

BTC Fibre Optics Projects

In 2005 the Gaborone and Francistown metropolitan areas introduced extensive fibre networks servicing to all business and industrial sectors. In addition, BTC provided dedicated fibre rings, interconnecting all major buildings in the Gaborone government enclave.

An optical fibre link has been introduced between the southern and eastern corridors of the country between Gaborone and Francistown. Other links are planned, which will bring high-quality fixed-line links to the entire country.

Connectivity to South Africa has recently been complemented by the Tlokweng fibre, allowing BTC to transport traffic from neighbouring countries into South Africa. Global connectivity is being addressed by shifting primary communication from satellite to fibre-optic systems. A partnership has been established with British Telecom to hub Internet and packet connectivity into London.

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ICT in Education in Burkino Faso

by Babacar Fall
June 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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Overview

Developing the education system in Burkina Faso will involve equipping more people with a basic quality education and guaranteeing development in the post-primary education sector. Through these two main initiatives, Burkina Faso will strengthen its workforce and add to the number of skilled workers, professionals, and other contributors to its culture, economy, and status.

Disparities in access based on location, gender, and age, in addition to the lack of rural communication structures, are Burkina's major constraints to universalising ICT use. However, with a plan to develop ICT infrastructure in Burkina Faso, and an increasing demand for modern technologies and information, the education sector is welcoming progress toward the integration of ICT into its school systems, with the help of various partnerships from public and private organisations.

Country Profile

Burkina Faso, also called Burkina, formerly Haute-Volta, is a West African country bordering six other countries: Mali on the north, Niger on the east, Benin on the southwest, Togo and Ghana on the south, and Côte d'Ivoire on the southwest. The capital city is Ouagadougou, located in the centre of the country.

Burkina Faso suffers from severe economic depression due to its arid climate and the fact that 80% of its population derives its livelihood from agriculture, which accounts for 32% of the country's GDP.[2]

With a very weak GDP per capita, no direct sea access, and a scarcity of natural resources, Burkina Faso is one of the least developed countries in the world. Over 46% of the population of 13.3 million live below the poverty line.

Table 1 provides some selected socio-economic indicators for the country.[3]

Table 1: Economic Indicators: Burkino Faso

Indicator	
Area	274,000 km^2
GDP (US dollars)	$5 billion
GDP per capita (US dollars)	$428 (2005)
Growth rate	7.5% (2005)
Average annual inflation	6.4% (2005 estimate)
Balance of trade	-10.6% of GDP (2004)

The Education System

The rate of schooling is 36% in primary school and 8% in secondary. In total, only 23% of adults are literate. The country has 16 scientists working in research and development for

every one million people (compared to 2,718 in France and 5,695 in Iceland) and expenditures in this domain represent 0.2% of the GDP (compared with 2.2% in France). Development in education appears to be a major challenge.[4]

The plan for the development of the education system by the year 2010 is based on two principles:

- To increase the coverage of basic education in order to universalise education while improving its quality
- To guarantee the development of the education system, including the post-primary level, in order to meet the demand for a qualified workforce and ensure those who have been to school respond to the needs of the economy, both in quality and in quantity.

The priority for the next 10 years is, therefore, the development of the post-primary levels in education. This means achieving a better balance of the system on one hand, and meeting the development needs of the modern employment sector, and of the urban and rural informal sector, on the other.

In so doing, Burkina Faso wants to promote an education system that is accessible to a great number of people. It should also conform with the collective and individual needs, promote progress, and protect the national cultural heritage. To accomplish these goals, the education system must:[5]

- Permit greater access to basic education by expanding and improving efficiency of its own structures and the development of a large partnership
- Give young learners knowledge, skills, and values that will allow them to flourish as individuals and be prepared to be active participants in life and progress of the community
- Provide the country with the necessary human resources for its economic, social, and cultural development
- Pass down the national values and affirm the cultural identity, while opening children's minds to the outside world and universal values
- Take action in the fight against poverty and inequality in all its forms, in the consolidation of democracy, and the defence of human rights, through the knowledge and values it imparts, and its relationships with the environment

Burkina Faso has two university centres, one in Ouagadougou and the other in Bobo-Dioulasso (the two main cities, about 400 kilometres apart), in addition to the College of Koudougou (approximately equidistant from Ouagadougou and Bobo-Dioulasso). The National Scientific and Technological Research Centre (CNRST) centralises the country's research activities. In 2003, Burkina Faso had nearly 18,000 students enrolled in higher education, with the majority (15,000) in Ouagadougou.

ICT Policies

The setting up of the 2000-2004 national information and communication infrastructure in Burkina Faso was approved in October 2000[6].There are several sector strategies for its implementation. Some inter-ministerial committees have been created to ensure its follow-through.[7]

The telecommunications sector is regulated by Law 051/98/AN, enacted in December 1998. This law liberalises part of the sector and creates a regulatory body, ARTEL. The National Telecommunication Office (ONATEL) exercises a monopoly on international and fixed telephone services. However, a process for privatisation is underway.

In the domain of computers, the major strategies are defined by the High Council in Computers, presided by the head of government. They are implemented by the Computer General Delegation (DELGI), created in 1990. This delegation plays the role of regulator in the computer sector.

Infrastructure

Burkina Faso has one fixed and three mobile telephone operators. Table 3 provides a snapshot of the state of national ICT infrastructure in the country.[8]

Table 2: ICT in Burkino Faso

Indicator	
Telephone lines	36,000
Cellular phones	200,000
Radios	370,000)
Television sets	2,000,000
Internet users	20,000
Internet service providers	10

ICT in Education

In a plan to develop national infrastructure and the most important sectors for integrating ICT,[9] the specific objectives in education, research, and innovation aim to improve access to scientific and technical information. Furthermore, the plan seeks to involve researchers in the development of innovative technology that the country needs for its development across a network for education and research. This network will open access to scientific and technological information, education, knowledge, and know-how, and will ill increase the value of locally developed products.

It is a fact, however, that there is a great need for schools to be equipped with computer technology, be it for management or teaching purposes. Currently, the University of Ouagadougou has a specialised 256 kbps connection which serves the National Network of Education and Research (RENER). This network connects a number of organisations including the university's Centre of Computer Calculation; the administration for NTIC-DPNTIC); RESAFAD TICE, an organisation focusing on the development of ICT for education and training; the Inter-State School of Rural Equipping Engineers (EIER; the Institute for Research and Development (IRD); the Digital Francophone Campus (CNF); and the Central University Library (BUC).

The Digital Francophone Campus (CNF) of Ouagadougou has its own specialised 128 kbps connection, hired from ONATEL. It has several rooms for training, database consultation and Internet navigation.

The Virtual African University (UVA) officially supports the University of Ouagadougou. This project, initiated through the partnership with the World Bank, is currently funded by the Canadian Cooperation with the University of Laval. It consists of creating an on-line university, entirely dedicated to Africa. It unites about 20 partner universities throughout sub-Saharan Africa.

Current ICT Initiatives and Projects

ICTE-Burkina[10]
This project seeks to improve the quality of education in Burkina's secondary schools through the integration of ICT in education (ICTE). The focus is on the academic community of the high schools and junior high schools in Burkina, the chief administrators in secondary schools, and educators, librarians, students, and supervisors. Its objective is to guide them all through the process of incorporating ICT, adapted to the structure of their school.

The specific objectives of the project are to:

- Improve access to ICT in high schools and junior high schools
- Build the capacities of key actors in secondary education, in the area of ICT
- Promote the integration of ICTE into teaching practices
- Support the development of local teaching content
- Promote digital culture in secondary schools
- Support initiatives to integrate ICTE in Burkina

Its creation was made possible by the International Institute for Communication and Development (IICD).

World Links Burkina Faso[11]
The World Links programme intervenes mainly in primary and secondary schools for computer equipment, ICT implementation, and teacher in-service training. In addition, it also participates in computer projects at the level of Koudougou TeacherTraining School (ENS).

Ten schools (eight secondary and two primary) and two pedagogical institutions have benefited from World Links support. Each school has an Internet-ready computer laboratory with 10 computers connected to the network. Meanwhile, Word Links has trained more than 300 teachers and over 750 students and 60 pedagogical trainers on modules about initiation to computing, pedagogical applications of the Internet, managing collaborative projects, maintenance, network setting, ICT applied to others subjects and Web site design.

For more information: www.worldlinks.bf

E-School Demonstration Project
This project, the first phase of the NEPAD e-Schools Initiative, hopes to have all secondary schools on the continent computer equipped with Internet connectivity and trained teachers by the end of the next decade. Burkina Faso is one of the countries included in the Demo which is being implemented by private sector consortia. The two consortia working in Burkina Faso are led by Advanced MicroDevices (AMD) and Hewlett Packard (HP).

At the level of higher education, ICT has been recognised as one of the major axes of capacity reinforcement in the universities in the South. The programme "Information and Communications Technology and Knowledge Appropriation" is led by the Francophonie University Agency (AUF).

Ben-Scolarite
Ben Scolarite is school management software that was tested in 15 public secondary schools in Ouagadougou during the 2005-06 school year. This software gives reliable and regular data on financial, pedagogic, and administrative matters in high schools and junior high schools. Microsoft, the Netherlands Embassy, and the World Bank have provided the project with their technical assistance.

The e-learning reply to the teacher shortage
Several efforts have been made to fight the teacher shortage by international organisations such as the Francophone Support Network for the Adaptation and Development of Information and Communications Technology into Education (RESAFAD-TICE) and the AUF. Training at the national level is ensured by many structures. Computer training at the university level integrates the Computer College (ESI) which offers engineer training in computers on one hand, and many other parts of BTS and DUT on the other. Such training is in addition to that provided by university partners such as RESAFAD-TICE, AUF, or the CISCO region centre for network administration in the universities.

National Internet Week (SNI)
During the National Internet Week in June, there is a Web night when the best production of Web content in Burkina is rewarded.

Academic partners: distance training[12]
Many universities are involved in diversified macro projects to develop academic partnerships. For example:

- The Italian Consorzio Nettuno mobilises about 30 universities and the polytechnic institutes of Turin and Milan. This consortium broadcasts courses through digital television and the Internet.
- France currently structures its contribution in this domain and foresees several parallel projects. The management activities will be combined in a project called Canège (around Paris-Dauphine)

These projects provide training in computing, administration, management, and finance. The course are organised with the help of tutors, and students receive hard copies of the courses and liaise with their tutors through e-mail or on-line systems.

Implementing ICT in Education: What Helps and What Hinders?

Table 3 provides a summary of the current stage of ICT development in Burkino Faso in terms of enabling or constraining features in the education system.

Table 3: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation	A national ICT infrastructure was approved in October 2000.	
Advocacy leadership	A plan to develop national infrastructure and the most important sectors for integrating ICT exists.	
Gender equity		A study published by Sylvestre Ouédraogo[13] in September 2000 revealed that the Internet users polled were mainly men (68.7%).
Infrastructure and access		Access is isolated and costly. In rural zones, the electrical network remains chaotic and it is compulsory to use an electrical regulator to avoid power surges.

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ICT in Education in Burundi

by Harry Hare
May 2007

Source: *World Factbook*[1]

Please note:

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Overview

The crisis of 1993 and the long drawn-out conflict that followed in Burundi had a devastating effect on education and greatly exacerbated the underlying problems that existed before. However, a new momentum has been achieved and Burundi is now fully in recovery.

Critical to recovery is the education development plan that is expected to be finalised this year and that will spell out the government strategy for the education sector. The national ICT for development policy that was adopted recently is expected to focus the adoption and use of ICT by the country to achieve its strategic objectives.

It is, however, important that an ICT for education policy that identifies the priority areas in which ICT can catalyse development and improve both access and quality of education in the county be developed. This sector-specific policy should take into account the overall education strategic goals drawn up from the development plan.

Country Profile

Since 2000, Burundi has made considerable progress towards peace and political reconciliation and has taken the first steps towards economic and social recovery. The country has undergone a major transformation since its first democratically elected president was assassinated in October 1993 after only 100 days in office, triggering widespread ethnic violence between Hutu and Tutsi factions. Over 200,000 Burundians perished during the conflict that spanned almost a dozen years. Hundreds of thousands of Burundians were internally displaced or became refugees in neighbouring countries.

An internationally brokered power-sharing agreement between the Tutsi-dominated government and the Hutu rebels in 2003 paved the way for a transition process that led to an integrated defence force, established a new constitution in 2005, and elected a majority Hutu government in 2005. The new government signed a South African-brokered cease-fire with the country's last rebel group in September 2006, but it still faces many challenges.

Covering an area of 27,834 square kilometres, Burundi is one of the most densely populated countries in the world, with an average of nearly 250 people per square kilometre. Burundi is landlocked, neighbouring Tanzania to the east, Rwanda to the north, and Democratic Republic of the Congo to the west. The country has an annual population growth rate of 3.7% while 46% of the population is under 14 years. The economy is predominantly agricultural with more than 90% of the population dependent on subsistence crops. Economic growth depends on coffee and tea exports, which account for 90% of foreign exchange earnings.[1]

Table 1 provides some selected socio-economic indicators for the country.[1,2]

Table 1: Socio-economic Indicators: Burundi

Indicator	
Population	8 million (2006)
Languages	Official languages: Kirundi and French. Other: Swahili.
GDP per capita	$700 (2006)
Human Development Index (2004)	169 (out of 177 countries)
Human Poverty Index (2004)	78 (out of 102 countries)
Expenditure on education (as a percentage of GDP)	5.2% (2004)

The Education System

The Burundi education system comprises formal and informal teaching. The formal education is made up of four levels: pre-primary (kindergarten), primary, lower secondary, and technical secondary and upper secondary. Kindergarten schools enrol children aged three to six years. The schools providing this type of education in Burundi are mostly privately owned. Primary education lasts for six years leading to the Certificat d'Etudes Primaires (elementary education).

Secondary education is divided into lower (four years) and upper (three years) education. Lower secondary education lasts four years and is available to those who pass the National Entrance Examination. Upper secondary level takes another three years after lower education and leads to the Diplôme d'Etat, which gives access to higher education. Technical secondary education lasts seven years.

Higher education is mainly provided by the University of Burundi. It is largely financed by the State and enjoys administrative and management autonomy. It is administered by a rector appointed by the president of the Republic for four years. Policy-making is the responsibility of a governing board appointed by the president of the Republic and representing the major spheres of activity concerning higher education development. Four private universities have been created recently.[3, 4]

Primary school teachers are trained in high schools (lycées pédagogiques), which offer studies divided into two cycles of two years each. In-service training of primary teachers is a regular activity of the Office for Rural Education (BER), a curriculum development agency.

Table 2 provides rates of enrolment at various levels of education.

Table 2: Selected Education Statistics[5]

Indicator	
Primary enrolment (% of gross)*	93.1 (2004)
Secondary enrolment(% of gross)*	29.3 (2004)

Tertiary enrolment(% of gross)*	5.6 (2004)
Gender parity index (GPI) **	0.8 (2004)

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**GPI = the level of access by females to education compared with males.

Education Policies

Burundi is currently developing its education sector development plan which is expected to be ready by the end of 2007. Several development partners have been assisting in this process and support for some of the component of the plan is already being sought out.[6]

In absence of the plan, the education sector is broadly directed by the country's poverty reduction strategy (PSRP),[7] which has identified improvement in access to and quality of education as one of its priorities. The strategy efforts are primarily focused on rehabilitating facilities damaged during the crisis, building new facilities, redeploying personnel to areas where there are shortages, ensuring the availability of minimum supplies and teaching materials, organising teacher-training courses, and examining in-depth reforms to the system.

Primary School Level
The specific objective at the primary school level is universal enrolment. To achieve this, primary schooling has gradually been made compulsory for all, and last year the government made it free. The government is now struggling with the significant financial effort in sustaining the free basic education.

Secondary School Level
The government has encouraged the establishment of community and private secondary schools and colleges. Substantial support from government and donors is still required, however, to provide the schools with adequate teaching materials, qualified teaching staff, and the minimal facilities needed to ensure an acceptable quality of education.

Higher Education Level
At the higher education level, focus has been on training teachers and developing retention strategies for teachers. The strategy also calls for a balance between training needs and market needs at the university and other colleges of higher leaning.

Education for All
In line with objectives for Education for All (EFA) the government created a team at the Ministry of Education and Culture (MINEDUC) to produce a comprehensive Strategy Note.[8] A draft of the Strategy Note has already been produced and validated, and it was formally presented to all financial and technical partners in October 2006. The main principles of the Strategy Note are to:

- Expand access and retention at the primary level to reach universal completion by 2015
- Improve quality and pertinence at all levels
- Improve equity and efficiency in the allocation of education resources
- Improve human resources and administrative and information management

- Manage the transition between education cycles to ensure a sustainable path to 2015

Tertiary Level
The Burundi Youth Training Centre was established to provide practical training for youths in order to prepare them for the job market. It has been at the forefront of ICT training in the country, teaching youths productivity software applications and operating systems such as Windows and Linux.

Infrastructure

Burundi adopted a national ICT development policy late in February 2007 as an update to the national ICT strategy adopted in 2004, but it has not been implemented due to the government's focus on the post-war cease-fire issues and lack of funding. The national ICT development policy has six strategic objectives:

- Capacity-building
- Enhancement of a legal and regulatory environment
- Promotion of a base infrastructure
- Promotion of good governance
- Promotion and encouragement of private investment
- Promotion of the development of content and applications

Table 3 provides some current statistics for ICT infrastructure in Burundi. [9]

Table 3: ICT Infrastructure in Burundi

Indicator	
Telephone lines	35,000
Mobile phone subscribers	200,000
Internet users	2,000 (2006)
Television stations	2
Internet hosts	1,088 (2006)
Radio stations	12

Despite having a policy in place, ICT uptake in Burundi is still very low with most of the ICT facilities concentrated in the capital city Bujumbura. The country lacks a specific policy for ICT use within the education sector despite recognising ICT as an enabler in increasing access and quality of education.

ICT in Schools
There is no documentation indicating that there is any use of ICT in the national public school system currently. However, there are a number of privately owned secondary schools that teach basic computer lessons for productivity applications such as word processing and spreadsheets. Computers are also used for administrative purposes, but not for learning and teaching.

ICT in Universities

There is much more use of ICT at the university level, although the facilities are still insufficient. The University of Burundi has a campus network for approximately 500 users, which was funded mainly by the United Nations Development Programme (UNDP). This network is connected to the Internet through one of the local ISPs. Connectivity between its campuses in Bujumbura is achieved through an omni-directional wireless link that is placed at the same campus that has the connection to the ISP.

The university has approximately 120 computers that are mainly used by lecturers and other university employees. A limited number of students have access to the computers and hence few have the privilege to surf the Internet on the campus network. But the university is expecting 500 donated computers for the university laboratories that will provide greater access to the students.

The university's main library, which is located at the main campus in Mutanga, is developing an e-library to share resources and publications with other universities abroad (National University of Rwanda, University of Bukavu, and University of Goma in the east of the Democratic Republic of the Congo).[10]

The Université Lumière de Bujumbura has approximately 55 computers with a wireless Internet connection from CBINET (ISP) on one campus and approximately 45 computers and a direct link to Intelsat with a VSAT dish on the second campus. Other universities have minimal ICT infrastructure, and it is mainly used for administrative purposes. These include University of Ngozi, Université du Lac Tanganyika, Université des Grands lacs, Université de Mwaro, and Université Martin Luther King.

Current ICT Initiatives and Projects

Reflect and ICT Project

This DFID-funded project explores potential applications of ICTs for poor and marginalised people and links to existing Reflect groups in Uganda, Burundi, and India. Reflect is an approach to adult learning and social change through which groups of people meet regularly to discuss and analyse local issues and devise action plans using participatory techniques. The basic unit is a circle, or group, usually at the village level, supported by a facilitator who is drawn from the local community and trained by the Reflect implementing organisation. In Burundi, ActionAid is the implementing organisation. There are six Reflect circles in Rutana and a national network of 10 independent Reflect associations.

For more information: http://www.reflect-action.org/Initiatives/ict/home.htm and http://www.reflect-action.org/Initiatives/ict/project/country/Burundi/burundi.htm#reflect

IT IS-LTAR e-Collaborative Learning Management System

This is an innovative e-collaborative project between professors in ITIS, an Italian technical school, and Lycée Technique Alessandro Rossi (LTAR), a technical school in Burundi, to

utilise broadband Internet to experiment with new ways of distance teaching and learning through screen sharing, video-conferencing and voice over IP. The project has also set up a learning management system using Moodle where teachers from the Italian school can collaborate with their Burundian colleagues to exchange experience and design learning

For more information: http://ltarngozi.org/moodle/mod/resource/view.php?inpopup=true&id=119 and http://www.ltarngozi.org/moodle/

LTAR School Connectivity Project
The World Istituto Tecnico Alessandro Rossi, a small Italian NGO, has raised and invested almost €500,000 for the support of a twin technical high school – the Lycée Technique Alessandro Rossi – in Ngozi, Burundi. The school has now been equipped for students studying electronics, computer maintenance, and electromechanics. The school received a donation of a VSAT system for broadband Internet connectivity from Eutelsat, one of the largest VSAT service providers in the world. The school has a network of 25 PCs, laptops, and a Wi-Fi antenna covering the entire school area.

For more information: http://www.elearning-africa.com/newsportal/english/news54.php

Computer Trailer: Burundi Youth Training Centre
In 2006 volunteers from the Burundi Youth Training Centre began a campaign to introduce ICTs in secondary schools by creating awareness among the school teachers, administrators, and pupils. The centre believes that ICT can play an important role in improving the quality of education in countries in development. The Computer Trailer project pilot phase equipped two secondary schools with 20 computers and a laser printer each. The second phase of the projects was to initiate computer clubs in these schools where volunteers will train the pupils in the schools. Those who receive training are then used to train others in order to spread the skills and awareness on ICT. This project is supported by African Computing and Webvolcans, both French NGOs.

For more information: http://www.bytc.bi/

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in Zambia in terms of enabling or constraining features in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework	The country recently adopted a national ICT for development policy that identifies ICT as an enabler in improving access and	The lack of an ICT for education policy and strategy means that implementation of ICT initiatives are not mainstreamed into the government

	quality of education.	development plans and therefore lack focus, resources, and a nationwide outlook.
Availability		Ninety percent of the population is rural, but most of the infrastructure is based in and around the capital city Bunjumbura, making the ICT infrastructure available only to the urban dwellers.
Access		ICT is still elitist in Burundi, making it too costly for most people. The lack of competition in most of the services also adds to suppliers maintaining high prices.
Effects of war	Given the size of the country, it can bounce back quickly and reconstruct the infrastructure from scratch using the latest technology that is cost effective and easier to deploy.	Due to the civil strife in the country most of the infrastructure was destroyed and therefore the country needs to reconstruct its ICT infrastructure.
Gender parity		Due to the war, a lot of children and especially girls have been affected by the displacement of families and therefore they are not attending school.
Electricity		Like in many other African countries, Burundi is struggling to provide reliable electricity to its citizens. Currently, however, only the major urban areas have grid electricity thereby inhibiting the use of ICTs in rural areas.
Level of priority		A lot of resources in the education sector are aligned with the sector development programme which is a bigger project dealing with basic fundamental challenges such as construction of classrooms and availability of textbooks. ICT is not a priority area.
Human resources		Lack of trained teachers with ICT knowledge contributes to the lack of interest or seeming lethargy in adopting ICT in the classroom. This aside, Burundi is also struggling with

		its human resource needs also as an effect of the war.
Interested partners	Two of the main distributors of refurbished computers in schools, Computer Aid and World Links have started working with the Ministry of Education. The pilot by World Links is now due for a wider rollout.	
Awareness levels		Lack of awareness is one of the major inhibiting factors in the use and adoption of ICT in the education sector.

Notes

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ICT in Education in Cameroon

by Tetang Tchinda Josué
June 2007

Source: CIA World Fact Book[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

The findings, interpretations and conclusions expressed herein are entirely those of the author(s) and do not necessarily reflect the view of *info*Dev, the Donors of *info*Dev, the World Bank and its affiliated organizations, the Board of Executive Directors of the World Bank or the governments they represent. The World Bank cannot guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply on the part of the World Bank any judgment of the legal status of any territory or the endorsement or acceptance of such boundaries.

It is expected that individual *Country Reports* from the *Survey of ICT and Education in Africa* will be updated in an iterative process over time based on additional research and feedback received through the *info*Dev web site. For more information, and to suggest modifications to individual *Country Reports*, please see www.infodev.org/ict4edu-Africa.

Overview

Cameroon is among the sub-Saharan African countries that are making enormous progress in the use of the Information and Communications Technologies (ICTs) in the various development sectors, including education. Private schools introduced ICTs into their curricula in the 1990s, but there is no specific policy guiding the teaching or use of ICTs in education, which has lead to each private school applying its own teaching method or programme.

ICTs were officially introduced into education in 2001 by the president. The Cyber Education project launched since then by the government targets two sectors: secondary and tertiary education. Primary schools are not yet concerned. The project started a slowly, but is now gaining speed. The French government plays a great role in the implementation and is a major partner both financially and technically.

Major achievements include establishing multimedia resources centres (MRCs) in universities, professional and technological schools, and some government secondary schools; training monitors to manage MRCs; creating learning platforms; interconnecting the six state universities, and establishing training units in professional schools and universities, some of which are now operational.

However, such projects rely mainly on external funding, thus putting their sustainability into question. Moreover, government secondary schools have poor purchasing power, and no budget has been allotted to them to support ICT-related activities in schools. Most computers used in schools are donations. Private schools have not been involved in the project, thus creating a gap between the two educational systems. Most of the online learning resources accessible through the government secondary school learning platform CAM-EDUC are in French, thus constituting a handicap for the English-speaking community. Moreover, all those online resources are based in Europe, indicating the need for empowering the national stakeholders to enable them to produce online learning materials corresponding to the local environment.

Country Profile

The Republic of Cameroon (République du Cameroun) is situated in Central Africa. Table 1 provides some selected socio-economic indicators for the country.

Table 1: Socio-economic Indicators: Cameroon

Indicator	
Area	475,442 square kilometres
GDP (2005)	$43.196 billion.
Official languages	French and English
English speaking	29%
French speaking	71%
Total population (thousands) (2005)	16,322

Population rate between 0-14 years	42%
Youths (under 25, of which 47% are between 5 and 24)	63%
Life expectancy (2005)	46
Urbanised population (2005)	53%
Average annual growth rate of urban population (1990-2005)	4.1%
Per capita gross national income (US dollars) GNI	$1,010 (2005)
Population below $1 a day, 1994-2004	17%

Sources: UNDP, Human Development Report 1998; First draft Cameroon NICI policy plan, 2001; UNICEF-at a glance-Cameroon Statistics, 2006, www.unicef.org/infobycountry/cameroon_statistics.html

The Education System

Cameroon has a public system of schools and universities, but there are also some schools and universities that are run by private investors. Others are run by religious organisations, mainly Christian churches. There are, however, a few Koranic schools. Both French and English are used in schools.

Table 2 provides a quantitative perspective of some selected system indicators.

Table 2: General Data on Education

Indicator	
Combined primary, secondary and tertiary enrolment ratio (% gross)*	62.3
Literacy rate	65%[2]
Adult literacy rate (ages 15 and older) (2000-2004)	68%
Male adult literacy rate (2000-2004)	77%
Female adult literacy rate (2000-2004)	60%
Youth literacy rate (2000)[3]	94.0
Net primary school enrolment/attendance (2000-2005)	79%
Male enrolment ratio, secondary school (% gross) (2000-2005)	51
Female school enrolment ratio, secondary school (%	36

gross) (2000-2005)	
Central government expenditure allocated to education (1994-2004)	12%
Enrolment ratios: females as a percent of males, primary school (% gross) (2000-2005)	85%
Enrolment ratios: females as a percent of males, secondary school (% gross) (2000-2005)	71%

Sources: UNDP, Human Development Report 2206, Cameroon Fact Sheet; First draft Cameroon NICI policy plan, 2001; UNICEF-at a glance-Cameroon Statistics, 2006, www.unicef.org/infobycountry/cameroon_statistics.html

ICT Policies

Although the government officially introduced ICTs in schools in 2001, there is not yet any specific policy guiding their use in education in Cameroon.

Legal and regulatory framework

The project for introducing ICTs in schools was given an impetus by two presidential statements[4] in 2001, which brought ICTs into the realm of education at all levels of schooling. These statements made it clear that imported computers and their accessories were to be duty free for schools. Moreover, the World Bank in its ICT task force policy has raised the concept of cyber education in the global school system[5] to promote the development of computer technology, to improve the accessibility of learners to information technology, and to encourage digital inclusion in developing countries.

Consolidating the presidential statement and the World Bank initiative, MINEDUC authorised the Inspectorate General of Pedagogy in charge of teaching computer sciences at all levels to design and develop a project on cyber education in Cameroon. The project was implemented in April 2001.

In 2004, key strategies on using ICTs in education were highlighted in the first official draft[6] of the Cameroon National Information and Communication Infrastructure (NICI) policy and plan prepared by the government with support from the United Nations Development Program (UNDP) and the United Nations Economic Commission for Africa (UNECA). In this document, the Cameroonian government recognises ICTs as a national priority along with education, health, forestry, and governance.

As indicated in the NICI plan document, the government has resolved to achieve the following:

- Modernising the educational system through the introduction of ICTs in schools
- Introducing ICT application training modules into national universities
- Preparing a sectoral ICT policy for the educational sector
- Training teachers in the use of ICTs
- Equipping all schools with ICT facilities
- Multiplying pedagogic resource centres for teachers and students
- Establishing distance training facilities
- Providing support for the production of ICT teaching materials (didacticals)

The plans are currently being implemented in the framework of two projects: one on cyber education, being prepared by the Ministry of National Education,[7] and another that concerns higher education (universities and professional training schools).

In June 2005 the Prime Minister of Cameroon signed a decree[8] creating and organising the national sub-committee for the integration of ICTs in education.

Policy implementation

The projects are implemented in collaboration with external partners and with support from the president of the country. The implementation phase started in 2001 and, since then, the government has signed a number of decrees to pave the way for the introduction of ICTs in education.

In 2002 a ministerial decision defining the condition for the creation of MRCs in government secondary schools was published. Then in 2003 a decree introducing ICTs in education was published by the Ministry of National Education (presently MINESEC, the Ministry of Secondary Education). The decree made it clear that ICTs would become an obligatory discipline beginning in September 2003.

The Ministry of Secondary Education was reorganised to include a new unit called CAAP, the National Pedagogy Support Unit (Cellule d'Appui à l'Action Pédagogique). CAAP is equipped with a distance training unit called Unité de Formation à Distance (UFAD) and is expected to ensure the training and capacity-building for teachers, which includes distance learning.

Factors influencing the implementation process include budget availability, weak linkages between stakeholders and project management, and co-ordination. There is no specific board or organ in charge of the co-ordination of the global cyber education project. Stakeholders seem to be evolving independently, thus resulting in some ignoring what others are doing.

Policy development

It was decided that an al ICT policy would be prepared for the educational sector, but to date, this has not occurred. It is obvious that stakeholders are in need of adequate co-ordination and technical support to design and adopt a specific policy.

Infrastructure

Private schools introduced ICTs in their curricula in 1990, 1998, and 1999, even before the government decided to introduce them in 2001. Some of them are using high technology to connect to the Internet either through VSAT or special lines.[9] However, the teaching is informal, and there is no record of the level of ICT penetration in those private schools. Actual figures area available only for government secondary schools.

According to the learning platform CAM-Educ[10] established by CFA Stephenson,[11] the project on the use of ICTs for teaching and training targets two sectors: secondary schools and tertiary education.

In 2000, there were 920 government secondary schools, and as of February 2007, only 17 of them, or 2%, have been equipped with MRCs. Currently, about 60,000 students are connected to about 1,000 computers.

ICTs predominantly used

Private schools are generally equipped with computer rooms. But in the framework of the Cyber Education Project, MRCs are being established in government secondary schools and are equipped with a local area network (LAN), servers, word processing software, and peripherals such as printers, scanners, and CD-Rom. They also generally have video projectors, videotapes, televisions, and Internet connectivity, some of which is through VSAT.

Students and teachers are mainly trained to use computers for word and photo processing, accessing the Internet, consulting e-mails, and participating in e-forums. Some also use CD-Roms for playing games and watching or reading various multimedia documents. Through the learning platform, students and teachers have access to didacticals and other learning resources. Students participate in chats through Yahoo Messenger and discussion groups, the latter often being used for conferences, especially by pupils involved in SchoolNet forums.

Some private schools offer distance training in connection with foreign universities in Canada, the US, and France through the use of CD-Roms, the Internet, instant messaging software, e-mail, and video-conferencing.

Universities, technological and professional training schools are also connected to the Internet, and most of them have MRCs. They are also equipped with distance training facilities, of which two or three are already operational.

Service providers

ICTs in education are provided by the following:

- Government
- NGOs
- Private sector, including individuals and enterprises
- Development and international organisations, such as UNDP and UNESCO
- Parastatal companies and agencies such as the Cameroon Telecommunications Company (CAMTEL), the Agence Nationale des Technologies de l'Information et de la Communication (ANTIC), and the National Agency

Until very recently, CAMTEL was the only Internet service provider for government secondary schools and universities in Cameroon, but private investors such as the Mobile Telephone Network are now coming on board. NGOs like SchoolNet Cameroon have and are still contributing to the establishment of MRCs by training teachers and students in the use of ICTs and by organising e-forums.

Current ICT Initiatives and Projects

Cyber Education Project in Secondary Schools and Universities (Tertiary Education)

The Cyber Education Project aims to use ICTs to support training in secondary and technical schools and in higher education (universities).

For more information: www.cam-educ.com/

Cyber Education Project in Secondary Schools

MINEDUC[12] (now called MINESEC, the Ministry of Secondary Education), prepared this project, for which the following actions were planned for first phase (2001-2007):

- Establishing MRCs in secondary schools: at least 10 in each province and 100 for the whole country by 2007
- Developing human resources by training monitors, teachers, and administrative staff: at least 1,600 monitors trained by 2007
- Training of teachers and administrators on the pedagogy for ICT use and implementation
- Connecting all MRCs to the Internet
- Establishing learning platforms and resources for students and teachers
- Establishing a distance training unit for teachers based at Cellule d'Appui à l'Action Pédagogique (CAAP), the pedagogy support unit
- Planning for distant follow-up at the end of the project.

Major achievements of this project include:

- 17 MRCs established in government secondary schools by February 2007
- 54 monitors of MRCs trained in 2006; 90 more are currently being trained (February 2007)
- 60,000 students have access to computers compared to 10,000 in 2001
- Teachers, directors, and the administrative staff of government secondary schools are regularly trained by MRC monitors
- A teachers' distance training unit hosted by CAAP is currently being established
- ICT sensitisation campaigns and seminars have been organised
- The learning platform for secondary education, CAM-EDUC has been established

As well, according to MINESEC, 80% of government secondary schools have computer rooms (which should be differentiated from the MRCs presently installed in schools in the framework of the Cyber Education Project) and two-thirds have computer labs.

The COMETES Project

The COMETES Project is funded by the French and implemented by a project co-ordinator in collaboration with the Ministry of Higher Education (MINESUP), the Association des Universités Francophones (AUF), the Université Paris I Panthéon-Sorbonne (France), and CFA Stephenson (France). Its main objective is to develop professionalism through distance learning and training. It involves five state universities, three technology institutes, and two engineering schools.

The project aims to:

- Set up a common distance training platform in the various technological schools
- Train "tutors" (monitors) in handling distance training courses and serving as mediators between remote training centres and local students
- Create a common distance training platform

- Set up a university network in connection with UNESCO
- Develop a curriculum to teach ICTs in universities
- Train the trainers in hotel management and tourism
- Train professionals: BA (project managers), BTS (technicians)
- Create the UNESCO chair or professorship "Culture, tourism and sustainable development in Cameroon for research, training and strategy for sustainable development"

Major achievements of this project include:

- The first workshop to train distance training monitors was organised in July 2006; the second training session was held on 20 February 2007.
- A learning platform for universities has been established: Cameroon students and lecturers now have access to distance training resources via ACOLAD,[13] which is run by the University of Strasbourg in France.
- MRCs have been established in all universities and technological schools.
- Distance training units are currently being established in universities and technological schools, some of which are already operational (e.g,, IUT of Douala and the Faculty of Agriculture at the University of Dschang).
- Several seminars, conferences, and meetings have been organised to sensitise university officials on the usefulness of ICTs for tertiary education.
- All universities are interconnected through a university network called UNINET, and the establishment of a university platform is underway.

For more information: www.projetcometes.org;www.cometes.uninet.cm

The AUF Programme

The Association des Universités Francophone (AUF) has a distance training programme called Campus Numérique Francophone which covers French-speaking countries of Africa, including Cameroon. Students and teachers who register benefit from distance learning programmes, and partners are also trained to handle distance training courses.

For more information: http://foad.refer.org

The Commonwealth of Learning ICT and Literacy Programme

The Commonwealth of Learning (COL), in the framework of its ICT and delivery programme, supports its member countries to facilitate the use of ICTs in their educational programmes. For example, in 1998, a study sponsored by COL helped to evaluate the possibility of setting up a remote teaching programme in Cameroon.

For more information: www.col.org

The Computer and Internet Literacy in Schools and Community Centers (CILS.CC) Cameroon) project

In November 2003, MINEDUC signed an agreement with the International Children's Foundation (ICF), a local NGO, for a three-year project aimed at equipping secondary schools and community telecentres with computers. In the framework of the project, ICF was supposed to support the government initiative regarding the supply of computers to needy schools; install and network computers in partner schools and community centres; contribute to the training of students in their school's Web site design; maintain ICT equipment; mediate for the arrival of Internet ambassadors in each school and centre; mediate for the twinning of the local school or centre with an entity in the US; and train schoolteachers and community centre managers for the ICT focal point.

For more information: www.worldcomputerexchange.org/partner_plans/Cameroon-Min-Letter3.jpg

SchoolNet-Cameroon

SchoolNet-Cameroon (ISC) is a non-profit organisation that enables young people to use the Internet and other new technologies to engage in collaborative educational projects that both enhance learning and make a difference in the world. ISC is part of the International Education and Research Network and SchoolNet Africa (iEARN). ISC facilitates collaborative projects where communities of learners collectively develop on-line content related to school curriculum. It provides training to teachers in the integration of ICTs across the curriculum. Currently, it is seeking to sign an agreement with MINESEC and plans to distribute 200,000 computers to Cameroon schools.

SchoolNet also works in collaboration with ROCARE, the African Teachers Network (ATN), and the UNDP in the framework of the Tokyo International Conference for African Development-Information Technology Project.

Major achievements in this project include:

- May 2001: 388 refurbished computers donated by the World Computer Exchange Network (WCE), an American organisation, distributed to 34 schools with a combined student population of 17,000
- September 2002: 400 Pentium computers and 50 printers were shipped to SchoolNet for distribution
- 2003-2004: online ICT training session for 53 teachers in Cameroon
- 2004: two training sessions organised for 150 teachers and directors of private secondary schools in the use of ICTs (financially supported by SchoolNet Africa in the framework of the Global Teenager Project)
- Active participation of students to online collaborative and educational projects such ThinkQuest Africa,[14] the African Teachers Network (ATN), and iEARN projects.
- Participation in the establishment of private multimedia resources centre in six of the 10 provinces of Cameroon (about 10 000 computers)[15]

- Participation in the study for the preparation of the Cameroon NICI Plan.
- 2007: 400 teachers expected to be training

For more information: www.iearn.org and www.schoolnetafrica.net

The ROCARE Project

ROCARE (Réseau Ouest et Centre-Africain de Recherche en Education) is a professional scientific, non-political, and non-profit association. Its members are made up of teachers and lecturers of West and Central Africa. ROCARE has national offices in Benin, Burkina Faso, Cameroun, Côte d'Ivoire, Gambia, Ghana, Guinea, Mali, Nigeria, Sénégal, Sierra Leone, and Togo. Its missions are to promote the African expertise in order to positively influence educational policies and practices. The ROCARE co-ordination unit is hosted by ISFRA (Institut Supérieur de Formation et de Recherche Appliquée) at Bamako, in Mali.

The ROCARE research programme includes the following subjects:

- Teaching quality and teacher management
- Impact of HIV/AIDS on education, and role and response of educational systems
- Education in countries in crisis or at war
- Utilisation of national languages in education
- Reform and decentralisation process; implication of the private sector in education
- Professional and scientific training and educational systems
- Contribution of ICTs to education in the African context

ROCARE works in partnership with the Ministries of Education of West and Central Africa, universities, teacher-training schools, research centre; the Association for Development and Education in Africa (ADEA); Educational Research Network for East and Southern Africa (ERNESA); Southern Africa Development Council (SADC); UNESCO; the International Development and Research Centre (IDRC), the Academy for Educational Development (AED)/SARA/USAID; Winrock International; AUF; the Centre Interuniversitaire Paul-Gerin-LaJoie de Développement International en Education (CIPGL), and the University of Québec, Montréal.

Major achievements in this project include:

- A regional study on the integration of ICTs in education in West and Central Africa was carried out. Various studies pertaining to the integration of ICTs in education were carried out in all member states. The results of those studies were validated during a workshop in December 2005.
- ROCARE, Cameroon branch, published a book on the integration of ICTs in education in Cameroon.[16]

All this work has been carried out with support from IDRC. Further ROCARE actions regarding the use of ICTs in education will continue to be implemented with financial support from IDRC.

For more information: www.rocare.org

The UNDP/TICAD Initiative

The TICAD project works to close the digital divide in Cameroon. Managed by the United Nations Development Programme (UNDP) , the TICAD-based initiatives have boosted the spread of ICTs in the country.

Since 2003, UNDP has provided support to the Cameroonian government for the formulation of a national ICT policy, strengthening of human and institutional ICT capacity, and enabling the private sector to maximise business opportunities offered by ICT for increased South-South co-operation. In this regard, the UNDP, along with UNECA, provided support to the Cameroonian government for the preparation of its NICI policy plan.

For more information: http://www.cm.undp.org/Gouvernance_Ticad.htm

The World Computer Network

The World Computer Network distributes computers to organisations in developing countries. A great number of computers have been distributed to Cameroonian schools through local NGOs.[17] The cyber education project is implemented with financial support from the French and covers secondary schools, universities, and technological and professional training schools.

For more information: www.worldcomputerexchange.org/

The NEPAD e-School Demonstration Project

The Demonstration project is the first phase of the NEPAD e-Schools Initiative that aims to ensure that all schools on the continent are equipped with ICT facilities with teachers trained to use them. The Demonstration project is led by the e-Africa Commission in partnership with the Cameroon ministry of Education and is being implemented in Cameroon by two private sector consortia led by Microsoft and AMD. Implementation will begin in the last half of 2007.

For more information: m-jean-patrice@caramail.com

Internet-based Learning of African Languages

This project was developed by Professor Emmanuel Tonye, lecturer at ENSPT (École Nationale Supérieure Polytechnique), Professor Emmanuel Soundjock Soundjock, lecturer at the Faculty of letters at the University of Yaoundé, and Jacques Mbede from ENSPT in Yaoundé, Cameroon, in collaboration with the Ministry of Higher Education of Cameroon and the Centre Régional de Recherche et de Documentation sur les Traditions Orales et pour le Développement des Langues (Cerdotola).

The project aims to teach African languages, especially Cameroonian, through the Internet. The project was announced in 2004, but nothing has moved forward since then.

For more information: http://www.lets.africa-web.org/Publi/TONYE_6.pdf

PROTÉGÉ QV E-learning Initiatives

PROTEGE QV (which means promotion of technologies that guarantee environment and a better quality of life), is a Cameroonian NGO created in 1995. It aims to promote individual and collective initiatives to induce rural development, to protect the environment, and to improve the well-being of the community. Some of their projects have been financed by Global Knowledge Partnership, the World Bank, the French Cooperation in Cameroon, the United States Embassy, the Japan Embassy, and the Commonwealth.

Major achievements include the following:

- Open Nkam e-learning: business training for women by women using traditional ICTs and radio-based training for women entrepreneurs to support them in setting up small businesses
- The Upper Nkam Women Opened to the Challenges of Innovations in ICTS: a project that introduced 150 women to data processing on computers
- Small Business Training for Women in Cameroon 2005: An ongoing project using a standardised multimedia CD geared to reinforce the capacities of women involved in small businesses
- A radio programme entitled “Woman and The Pride of Her Being” at Radio Fotouni to sensitise and share knowledge with the targeted women through radio messages

For more information: www.protegeqv.org

Implementing ICT in Education: What Helps and What Hinders

There are a number of constraints still facing the implementation of ICTs in education in Cameroon.

Policy development

There is not yet any policy regulating the teaching and/or use of ICTs in school. Although some aspects are highlighted in the Cameroon NICI plan, the integration of ICTs in schools seems to be done in an informal basis. Partners have not yet succeeded in designing a national policy despite the various meetings organised for that purpose.

Institutional challenges

Despite the legislation establishing ANTIC, the ICT sector in Cameroon still seems chaotic. There are no fewer than eight governmental players claiming authorship or supervision of the national ICT policy. The results are power struggles and subsequent appeasements which has a negative impact on ICT-related educational projects and programmes. This also explains why stakeholders haven’t

been able to reach a consensus on the preparation of a sectoral policy on ICTs in education and on distance learning.

Training and capacity-building

The great majority of teachers are computer illiterate, thus requiring a long training programme to ensure that they can use ICTs effectively. Currently, teachers don't have enough time to train themselves. Staff training started after the installation of MRCs, before even the first monitors were trained. It is clear that training needs to be accelerated.

Students' performance at school

According to ROCARE, the use of the Internet reduces students' performance in orthography and grammar, due to the vulgarisation of the argotic language used in chat rooms.

Linkages

Some actors seem to be left out. For example, private schools are not yet involved in the project on cyber education. Moreover, the African Institute of Computer Sciences-Cameroon Brach (IAI-Cameroun), which was ranked third among the top computer training centres in the world, has not been involved. The local expertise has been neglected. Additionally, there seems to be weak linkage between stakeholders, which makes collaboration difficult. Some are not even informed about what others are doing.

Learning platform

The content of the learning platform CAM-EDUC is French. Moreover, most on-line resources are in French also, especially those on literature and language. This constitutes a handicap for the English-speaking students. Either additional resources in English or a translation of the CAM-EDUC content is needed.

Management and co-ordination

There are many bureaucracy and leadership issues that slow the process of implementing ICTs in education. There is no co-ordinating unit and no secretariat to compile the reports and data on activities. A unit in charge of the teaching of ICTs in schools is needed. Such a unit should have an autonomous budget.

Sustainability

Nearly all the computers used in schools were donated, often second-hand, and they are now getting old, which means many of them are in need of repair.

Moreover, schools were not allotted any budget to purchase new computers or cover the cost of maintenance. Nearly all schools connected to the Internet are not paying their Internet bills to CAMTEL, and the connectivity hasn't been suspended only for fear of creating a disturbance that could jeopardise the government's efforts to introduce ICTs in education.

Presently, the project relies solely on external funding and is therefore not sustainable. The government needs to allott budgets to schools to support this initiative.

In private schools, students are asked to pay a fee to sustain the computer literacy programme and teachers pay for their training sessions.

Infrastructure

In some schools, MRCs are installed in inappropriate buildings, some of which have poor roofing systems. Appropriate halls need to be provided for computer literacy programmes in schools.

There is also a gap between rural and urban areas. Nearly all service providers are concentrated in urban areas. Many secondary schools are established in zones not yet reached by the electric power. To counter the situation, some have started teaching ICTs theoretically.

Building educational or learning platforms requires establishing adequate equipment to host and maintain educational Web sites and training staff to manage electronic data. This is a serious bottleneck for the various educational initiatives, since the educational institutions in general have weak ICT infrastructure. Some do not have Web sites, and the existing ones need to be well maintained to ensure that they are permanently functional.

Profit seeking

In some private schools, investors are looking for profit, and ICT courses are sometimes more theoretical than practical. Tuition in those private schools that are equipped with good ICT facilities and have a good ICT teaching programme is too high and not affordable to the average person.

Teaching materials

ICT teaching materials now used in government secondary schools do not correspond to the official programme designed by MINESEC. The ministry has still to write its own ICT teaching books and has temporarily adopted those developed by private schools.

Distance and e-learning

Despite the efforts made so far, the distance learning programme is still to be thoroughly popularised. The majority of people seem to be more comfortable with the traditional teaching methods. In Cameroon, only Yaoundé and Douala are very well connected. Prerequisites are not easy to meet at a personal level. The access to e-distance learning remains a challenge for Cameroonians.

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ICT in Education in Cape Verde

by Osei Tutu Agyeman
June 2007

Source: *World Fact Book* [1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

The findings, interpretations and conclusions expressed herein are entirely those of the author(s) and do not necessarily reflect the view of *info*Dev, the Donors of *info*Dev, the World Bank and its affiliated organizations, the Board of Executive Directors of the World Bank or the governments they represent. The World Bank cannot guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply on the part of the World Bank any judgment of the legal status of any territory or the endorsement or acceptance of such boundaries.

It is expected that individual *Country Reports* from the *Survey of ICT and Education in Africa* will be updated in an iterative process over time based on additional research and feedback received through the *info*Dev web site. For more information, and to suggest modifications to individual *Country Reports*, please see www.infodev.org/ict4edu-Africa.

Overview

Cape Verde has made significant strides in the implementation of ICTs in education. The drawback of doing so has been the exorbitant cost of Internet connection and services owing to the monopoly maintained by Cabo Verde Telecom. Further, the availability of the technology in terms of usability by the general population is limited to two islands where cyber cafés have been established by private companies nearly to the exclusion of the others. The 30% of the population living below the poverty line may never be able to access such facilities, and another 12,000 families may never enjoy such communication because of the terrain that makes it impossible for electric power to be extended to them using traditional means.

Country Profile

The Republic of Cape Verde comprises a group of 10 islands and five islets located 620 kilometres off the west coast of Africa, west of Senegal in the North Atlantic Ocean.[2] The capital of Cape Verde, Praia, is on Sao Tiago island. Nine out of the 10 islands are inhabited.

Cape Verde is one of the most stable countries in West Africa. The country became independent in 1975 after colonisation by the Portuguese. It was a one-party state until multi-party elections in 1990 ushered in a democratic government.

The country experienced repeated droughts in the second half of the 20th century that caused most of its population to leave. Consequently, the country's expatriate population is greater than its domestic one. Cape Verdians have both African and Portuguese ancestry and speak two languages: Portuguese, which is the official language, and Crioulo, the local creole.

Agriculture accounts for 11% of GDP,[3] industry 17%, and services 71% (2002).

About 30% of the population lives below the poverty line. A substantial part of the country's budgetary resources are from repatriated funds of its large, dispersed expatriate populations and donor sources.

Table 1 provides some selected soci-economic indicators for the country.

Table 1: Socio-economic Indicators: Cape Verde

Indicator	
Population[4]	420,979 (2006)
Growth rate	0.64% (2005)
GDP (US dollars)	$1,128 billion (2005)

GDP per capita (US dollars)[5]	$2,091 (2004)
Human Development Index	106 (out of 177 countries)

Education System

The educational system operates on a structure of six years of primary school and six years of secondary school. The secondary system consists of three cycles of two years each. Three-year vocational training follows 10 years of schooling, while university education may take three to four years.[6]

The Ministry of Education, Culture and Sports is responsible for primary and secondary education, and the Ministry for Higher Education is responsible for tertiary education, science, and technology. The education sector is allocated 20% of the country's budgetary resources.[7]

Table 2 reveals the enrolment figures for the different educational levels.

Table 2: School Enrolment

Level	2000-2004/5 (%)
Primary completion rate, total (% of relevant age group)	91
School enrolment, primary (% gross)*	99
School enrolment, secondary (% gross)*	67
School enrolment, tertiary[8] (% gross)*	6
Literacy rate, adult total (% of people ages 15 and above)	76.6

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.

The trained teacher population[9] is 72.7% with 66.7% being women. The pupil-to-teacher ratio in primary education is 26:9. In terms of gender equity, according to the World Bank, the enrolment rate for girls is higher than the rate for boys in secondary and tertiary education.

Each of the inhabited islands has at least one secondary school. The island of Sao Tiago has fifteen.

The major tertiary institutions include:

- The primary teacher-training institute, Instituto Pedagógico (IP)
- The secondary teacher-training institute, Instituto Superior da Educação (ISE)
- The Higher Institute for Engineering and Science, Instituto Superior de Engenharia e Ciências do Mar (ISECMAR)
- A private university, Universidade de Jean Piaget de Cabo Verde, which runs undergraduate, post-graduate, and doctoral programmes

Bilateral assistance from France[10] and Luxembourg has enabled Cape Verde to develop appreciable human resource capacity in the technical and vocational education sectors. Several training institutes on some of the islands are focal points for such projects. The first professional training centre for mechanics, metalworkers, plumbers, and electricians was opened in February 2007.

The country hopes to open its first public university with two campuses in 2008.

Infrastructure

Telephone infrastructure

Cabo Verde Telecom is the sole operator in the country providing fixed telephone, mobile phone and Internet communication services. The company has undergone three privatisation exercises since 1992 when government deregulated the sector. Nevertheless, it alone provides telephone services in the country.

The telephone service was liberalised in January 2007. Siemens Portugal is to provide a nationwide high-tech service for television transmission to all homes within two years via DSL broadband. The offer is to be expanded to include telephone and Internet services.

Though Cape Verde's telephone system is among the most efficient in the sub-region, its usage costs are prohibitive because of Cabo Verde Telecom's monopoly. This notwithstanding, ADSL Internet services[11] are available in the major towns on the islands and hotels offer connectivity for laptops.

Table 3 provides a snapshot of the state of Cape Verde's telecommunications infrastructure and usage statistics.[12]

Table 3: ICT in Cape Verde

Indicator	
Telephones - main lines in use	71,400 (2005)
Telephones - mobile cellular	81,700 (2005)
Radio broadcast stations	22 FM (plus 12 repeaters) (2002)
Television broadcast stations	1 (plus 7 repeaters) (2002)
Internet service providers	234 (2006)
Internet users	25,000 (2005)

Electrification

The country produces 44 million kilowatts per hour of electricity from fossil fuels. On the islands of Sal, Boa Vista, and Sao Vicente, Electra, the water and power company, generates and distributes electricity. On the small islands, the municipal authorities handle power generation and distribution. In anticipation of an upward turn in investment

and tourism, the government took control of Electra in January 2007 but promised uninterrupted services.

In 1999 electrification was estimated at 60%.[13] However, the large distances between inhabited areas on the islands makes it impossible to provide access by traditional means to about 32,000 families of which 12,000 may never have access.

ICT Policies

The country's ICT policy was co-ordinated by the Ministry of Infrastructure and Transport. The National Information and Communication Infrastructure (NICI) plan,[14] which was finalised in 2001, prioritised the following sectors for strategic implementation:

- Education
- Health
- E-government
- Regulation
- Environment protection
- Infrastructure development

UNECA and the International Development Research Centre (IDRC) of Canada assisted the country to develop the NICI plan.

ISECMAR is the top-level administrator for the .cv domain and reports to the Commisao Instaladora do Ensino Superior in the ministry, which has responsibility for the communications sector and employs two ministerial organs[15] for sector administration and control: the Telecommunications Council (TC) and the ministerial Department of Communications (DGC). TC is an intersectoral consultative organ that co-ordinates operations of telecommunications systems and promotes ICT. DGC is responsible for the design, implementation, and execution of telecom policies. The latter drafts laws and regulations on operations and technologies in the telecom sector.

Educational policy
The following objectives are articulated in the country's Education for All (EFA) policy:[16]

- Universal access to education for all children at age seven and a compulsory school age of six
- Improvement in the teaching methods
- Encouragement of private participation in the provision of education
- Elimination of illiteracy by 2000
- Promotion of vocational and technical education focusing on the development of the rural and semi-urban areas
- Use of information channels to introduce new educational technologies

- Enlargement of the receptive capacity of the school system and promotion of quality teaching
- Adaptation of the curricula to national development realities

The specific objective of using information channels to introduce new educational technologies was reinforced by the Strategic Education Plan for 2003-2013, which recommended the establishment, strengthening, and replication of information and communication networks in the education system.

Current ICT Initiatives and Projects

Telecom laws and regulations
Since 1995 Cape Verde has employed ICT as a development tool. The Department of Social Communication in the Presidency is responsible for:

- Creating the legal and institutional framework for ICT
- Reducing the cost of usage of the different communication technologies
- Providing public access to ICT

In 1995, Law No. 500 was enacted; it defines competencies, competition laws, development of new services, and technologies without specifically mentioning ICT. The law seeks to regulate the planning and development of free markets, tariffs, and technical rules for the telecommunications sector. However Law No. 72 of 1995 gave Cabo Verde Telecom exclusive concession for 25 years with the possibility for renewal for a minimum of 15 years.

The drive towards modernisation was enunciated in the 1997 development plan and also debated in the National Forum for Consensus Building for the Transformation of Cape Verde. Resolution No. 15 of 7 July 2003 also created an information society in the country.

Telecom infrastructure expansion
Cabo Verde Telecom has linked all the islands by fibre optic cable and has provided telephone access to communities of a minimum of 200 inhabitants including the provision of phone booths in rural areas. In addition, the country is served by an international submarine cable that facilitates international communication and Internet access. These developments have facilitated the expansion of Internet services.

About 3,100 individuals and companies subscribe to the company's Internet service and have either Web sites or e-mail addresses. Several state companies and institutions have invested in ICT.

Nascent e-government structures
In 1997, the Ministry of Finance initiated a project that became the motivation within government to use ICT. This project, the National Administrative and Financial Reform (RAFE), was the first to introduce the idea of intranet into government service.

When the government's decentralisation policy found expression in its political and administrative structures, the process was facilitated by the administrative intranet that was installed to service the ministries, the municipal councils, and state organs. At present, the intranet links 56 buildings and 2,500 state employees.

Government support for ICT

Government has encouraged the private sector to establish computer maintenance companies, ICT training schools, and secretarial and communication services. Nonetheless, only an insignificant fraction of the population can use these services because the majority of families are poor. As well, the rural areas are not served at all. Currently the 20 cyber cafés on the islands are restricted to Praia and Mindelo with little else on the other islands.

ICT in secondary education

The 1990 basic law on the education system, which was revised in 1999, stipulates that secondary education must promote global, integrated, and life-long training for students. It emphasises technical and scientific training as the vehicle to enable students to participate in socio-economic development in order to promote the quality of work.

This adopted stance caused the introduction of new educational technologies into secondary schools. At present all secondary schools have computers and are equipped with computer laboratories. Some of those computers are connected to the Internet.

The lowest computer-to-teacher ratio is 1:28, and the lowest Internet-connected-computers to school-population ratio is 1:88. It is estimated that 25% of secondary schools do not have adequate computer equipment.

About 88% of secondary school teachers use computers daily, but 12% have never used them. Teachers tend to use computers to develop course material, prepare tests, do research, and prepare audio-visual presentations.[17]

ICT in tertiary education

All higher education institutions have computers and computer laboratories.[18] Universidade Jean Piaget boasts 162 computers, 20 projectors, and five panel projectors. As well, the university runs ICT degree programmes and professional courses including CISCO certification programmes.

ICT in teacher education

The challenge of limited physical infrastructure and resources led to experimentation with ICT in distance teacher education. The attempt, which was financed by the African Development Bank (ADB), enlisted 56 teachers using blended learning methodologies.

Further, the country has obtained assistance from La Fondation Calouste Gulbenkian to train 18 lecturers in ISE, IP, and ISECMAR. The master's course was organised in collaboration with Université d'Aveiro to equip the lecturers in the three institutions with

skills that will enable them to develop ICT-driven distance learning content and programmes.

The move is to help provide continual training to teachers and to train teacher-trainees without resorting to assembling all participants in a central location in limited physical space. The goal is to increase the number of teachers.

Non-formal education

Adult education is organised in three stages, only those between the ages of 15 to 35 are admitted. The programme focuses on reading, writing, and arithmetic skills and aims at training participants for the job market with the final objective of integrating them into the workforce through the creation of micro-projects. Between 1992 and 1996, 5,227 adults and youth were trained and 401 multi-sectoral micro-projects were launched.

Post-literacy training covers vocational skills and community and reading activities. Mobile libraries are established on four of the islands (Sao Tiago, Sao Nicolau, Santo Antao, and Fogo) and help instructors to run post-literacy training programmes. The mobile vans tour most remote areas on the islands. Community literacy activities are for information, communication, and public education.

Year 2000 was targeted for eliminating illiteracy in the priority age group of 15 to 35 years with concomitant illiteracy reduction in the general population to 12%. The rate of illiteracy in the prime target population was 6% in 1990. The programme was successful due to the functional literacy and vocational training accompaniment.

NGOs also participate in adult literacy activities. Substantial support was received from the United Nations and the European Union for these programmes, which involved citizenship and peace issues, democracy and human rights, hygiene and health, and population and family life.

The contribution of the press has been a critical success factor in the adult literacy programmes. A special publication, *ALPHA,* was used to promote reading culture in the literate adult population.

Radio and television in education

The Department of Educational Technologies in the Ministry of Education established Educational Radio in 1990 which was used to promote:

- Training elementary school head teachers
- Airing educational programmes
- Transmitting non-educational programmes

Another educational radio[19] was launched in October 2003. The station has a different three-pronged purpose: development, training, and education.

Other radio stations contribute to social communication. Different stations emphasise different social and community programmes and projects with the sole aim of sensitising communities on social responsibilities.

There is also ongoing collaboration with other Portuguese-speaking countries to launch television channels via satellite and the Internet[20] to all its islands. The facility will be used to feature and promote educational programmes. Meanwhile a health education programme designed by the Cape Verde Institute for Action in Social Education (ICASE) is already being transmitted by radio and television.

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in Cape Verde in terms of enabling or constraining features in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling features	Constraining features	Risk factors
ICT deployment	High-speed Internet connection to be made commonly available on all the islands by Siemens Portugal.	Private businesses concentrating cyber cafés only on the more populated islands to the exclusion of the others because of commercial interests.	The impossibility of the very poor 30% of the population to access available installed Internet capacity.
Non-formal education	Rather innovative way of combining vocational training and job market insertion strategies with adult literacy programmes increases interest and participation in the target populations.	Mobile vans for post-literacy follow-up activities limited to four of the islands, so other remote populations are not catered for.	Paucity of government funds may in future stall the process.
Gender equity	Cape Verde has achieved greater enrolment ratios for girls than for boys.	.	
Vocational and professional education	Government still building vocational centres to cater for more placements.	Government unable to build more schools due to budgetary constraints.	Absence or suspension of bilateral aid may adversely affect those vocational institutes that benefit from donor supported programmes.
ICT policy and implementation	The drive to computerise all second-cycle and	Not introducing ICT at the basic school level	The exorbitant cost of Internet and

	tertiary institutions and the involvement of the private sector will ensure sustenance of the ICT industry and information society.	is a drawback in the country's drive towards the information society.	communication services may kill a potentially vibrant nascent ICT industry because of monopoly.

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ICT in Education in the Central African Republic

by Babacar Fall
June 2007

Source: *World Fact Book*[1]

Please note:

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Overview

The Central African Republic (CAR) faces many challenges to make a greater effort in training, budgeting, and awareness creation concerning the use of ICTs. Introducing ICTs into basic education (especially in secondary education) is increasingly seen by many as a necessity, and the development of teacher skills is necessary to enhance the use of educational technology.

The country has only one university and enrolment rates are low for most levels of education. To reverse this situation, the government has made some worthy efforts to promote basic education, such as the building of new schools in the capital and the provinces with assistance from the European Union and the World Bank.

Country Profile

Occupying a surface area of 623,000 square kilometres, CAR is a landlocked country bordered by Chad on the north, the Democratic Republic of Congo and the Congo on the south, Cameroon on the west, and Sudan on the east. Its highest point is Mount Ngaoui, at 1,420 metres. The official and economic capital is Bangui, which has a population of 600,000.

The country's climate is mostly tropical, with a wet season from May to October and a dry season from November to April. The climate varies from region to region, with an equatorial climate in the south, inter-tropical from Carnot to Berbérati in the west, and desert towards Birao in the north. The dry season lasts eight to nine months, and there is a cool and stormy season on the highlands.

The country is divided into 16 prefectures and 67 sub-prefectures. A predominantly agricultural country, CAR exports timber, coffee, and diamonds. Its mineral resources include uranium, iron, and oil, but these are not exploited yet.

Table 1 provides some selected socio-economic indicators for the country.[2]

Table 1: Socio-economic Indicators: Central Republic of Africa

Indicator	
Area	623,000 km²
Population	3.5 million
Demographic growth rate	1.7 %
Population density	5.7 people/km²
GNP (US dollars)	$0.97 billion
GNP per capita (US dollars)	$270
GNP real growth rate	+3.3 %

The Education System

Law 97.014, enacted December 10, 1997, concerning education is the essential element of stopping the drift in the education system. It emphasises that education is a national priority and that every citizen is entitled to education and knowledge.

The National Education Development Plan (PNDE) sets the general strategy for reaching the objectives of quality, efficiency, accessibility, and equity in education for the next 10 years. Some strategies in the education section of the National Plan for the Fight Against Poverty (PNLCP) are akin to those of PNDE.[3]

In 2003:

- The total illiteracy rate was 57.3% (46.2% men, 68.0% women, and 70.9% in rural zones)
- The total schooling rate in the Fundamental 1was 68.7% (58.7% were women and 46% in rural zones)
- The net schooling rate in Fundamental 1 was 40.7% (44.3% men, 36.9% women, and 26.7% in rural zones)

The change in the net schooling rate in the Fundamental 1 indicates a decline in the rate from year to year:

- 1988: 47.8%
- 2000: 42.9%
- 2003: 40.7%

The total schooling rate in the Fundamental II (junior high school) was 10.8% (12.6% men and 9.0 % women).

There is only one university, and the enrolment is low. The relative proportion of students in the total population is just as low. To reverse this situation, the government has promoted basic education, especially for primary and secondary institutions. In the past few years, the state has built new establishments in the capital as well as in the provinces, thanks to funding from the European Union and the World Bank.

ICT Policies

The elaboration of a national strategy began in January 2002. The government decreed a process to set up the National Plan for Information and Communication Infrastructure (NICI). Some consultation workshops were organised for members of the government, university staffs, the private sector, managers, and authorities in telecommunication regulation. Subsequently, an initial study was carried out in June and July 2002. The current government proposed organising a national workshop to validate and activate the NICI plan and to reach a consensus.[4]

The national policy aims to:

- Promote public participation through dialogue
- Support initiatives of basic communities through information, knowledge, and technical skill exchanges
- Broadcast information and introduce new innovations through availability of social communication instruments
- Promote systems of popularisation, supervision, training, and horizontal communication

The Director of the Development of Technology, a branch of the Ministry of Telecommunications and Technology, created in 1999, is responsible for this policy.

Infrastructure

Table 2 provides a snapshot of the state of national ICT infrastructure in the country.[5]

Table 2: ICT in Central African Republic

Indicator	
Literacy rate	49.6
Televisions per 1,000 people	6
Radios per 1,000 people	80
Fixed telephone lines per 1,000 people	2
Cell phones per 1,000 people	3
Personal computers per 1,000 people	1.9
Internet users (thousands)	2
Total number of main lines	12,000 (10,000 in Bangui, 2,000 in the provinces)
Number of mobile phone subscribers	60,000
Telephone density	0.34 (phone lines/100 people)
Main lines growth rate	8%

Given the underdevelopment of the basic network, access to ICT is for now only possible in the capital, where there are around 1,800 Internet subscribers out of a population of 600,000. Twenty private cyber cafés and two education centres offer Internet access on work days. The insufficiency of the basic network is not due to a lack of political will but to the restricted financial resources.

Notably, the advent of ICTs in the country was delayed due to the low telephone density of the network.

ICT in Education

In Africa, the education sector is the first to benefit from the valuable uses of the Internet. Multimedia-supported instruction, distance education, and distance access to scientific information all constitute significant assets for those seeking to further their knowledge.

Still, there is a great need for resources to support and equip schools with computer technology, be it for management or teaching purposes. Several initiatives are in place to address this need, detailed below.

Current ICT Initiatives and Projects

Some pilot projects have been set up to equip urban zones with digital community centres. Three of these projects are in progress and three other centres are expected to be built next year thanks to outside funding.

- As part of its mission in Central African Republic, the United Nations Program for Development (PNUD) has developed an ICT plan that concentrates on the social and economic objectives of the Millennium Declaration and has a primary objective of enabling universal access to the information society. Its more specific focus is on policies related to education, health, employment, government efficiency, development of local content, and the social integration and the promotion of science, technology, and innovation. It is adapted to the country's national characteristics, needs, and values and emphasises the state's central role in the formulation and implementation of a policy tied to ICT, in partnership with international organisations, the private sector, and civil society. Its goals are to:

    - Use new and existing technologies to create universal connectivity by distributing information and communication materials so that everyone can benefit from easy access, including the elderly and handicapped
    - Develop connectivity, including Internet access, in institutions receiving many people such as digital community centres, schools, universities, libraries, post offices, community and cultural centres, archives, and museums
    - Find appropriate solutions for promoting ICTs adapted to the environment in remote, impoverished, and particularly rural zones, but also in poorly serviced or marginalised urban zones (e.g., by establishing multipurpose community access centres to guarantee integrated access to information and social services)
    - Find solutions to make access to ICT affordable in regions with low revenues
    - Supply information and applications in the language and cultural context that is most familiar to the user, which will encourage further ICT use
    - Include unwritten languages by using audio-digital tools

- The close collaboration between PNUD, the Central African Government, and CISCO Systems has resulted in the creation of the local CISCO Academy of Bangui at the University of Bangui. This institution offers advanced training in conceiving, installing, and maintaining computer networks. This centre has already trained national technicians.
- The ADEN project, led by the French Cooperation for Democratising ICT Access, has created a number of centres where students can access computers and the Internet and receive tutorials from teachers. Teachers use the centres to search for information and to develop teaching materials. This has been so successful that the government has approved and authorised total exemption from import tariffs on equipment for ADEN centres all over the country.
- The Virtual Francophone Campus offers Trainings in ICT
- The Department of Higher Education, with aid from the French Cooperation, initiated a programme that aims to set up a network of all university institutions. This programme has enabled the creation of a multimedia resource centre (CRM) and the CISCO Academy with the support of PNUD/UIT. The CRM has already offered a training programme to attain a post-bachelor's professional degree. Twelve students

are trained every year in ICT vocations. In the future, the CRM aims to deal with tele-education and produce multimedia in CD-Rom format. A virtual campus will soon be installed by the Francophone Agency. Students are asked, at the end of their training, to carry out Web site creation projects (University, Pasteur Institute of Bangui).[6]

- The project supporting the fight against digital gap (ADEN) has been set up in 11 French, English, and Portuguese sub-Saharan African-speaking countries from by the International Cooperation of the French Ministry of Foreign Affairs. Its goals are to democratise Internet access, train people in the use of new technology, and encourage the African production of content. It responds to the question of how to reduce the digital gap in Africa by setting up a thorough plan for creating public Internet access centres in digitally isolated zones.[7] The main ADEN centres are Bambari "Ouaka," Bangassou, Berberati, Bouar, and Mbaiki "Wambangana."
- The International Telecommunications Union launched a project aiming to create a network of at least 100 multipurpose community call boxes (TCPs) in 20 African countries, including the Central African Republic. These TCPs will give communities access to ICT to enable them to participate in the information society. The TCPs will be managed by women, who can thus actively participate in the processes of development and decision-making on the African continent. This project is part of the commitment made by 175 countries that adopted an action plan during the first phase of the Information Society World Summit, aiming to make the advantages of ICT within humanity's reach.[8]

Implementing ICT in Education: What Helps and What Hinders?

Table 3 provides a summary of the current stage of ICT development in CAR in terms of enabling or constraining features in the education system.

Table 3: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation	The government decreed a process to set up the National Plan for Information and Communication Infrastructure (NICI).	A military-political crisis that took place March 15, 2003, severely affected the already-inadequate telecommunication infrastructures, and therefore the development of ICT.
Gender equity		There is a digital divide between the genders.
Infrastructure and access	Access to the Web through local telecommunication providers offers the population many opportunities to remove themselves from isolation.	Equipment is costly due to a difficult fiscal system
Collaborating mechanisms	The current government has proposed organising a national workshop to validate and activate the NICI plan and to reach a consensus.	

Factors	Enabling Features	Constraining Features
Fiscal resources		There are scarce financial resources.

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ICT in Education in Chad

by Babacar Fall
May 2007

Source: *World Fact Book* [1]

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Overview

Chad and its partners in development have adopted a 10-year strategy called Education and Training in Liaison with Employment (EFE), and the process for setting up a national ICT policy is underway.

Most of Chad's initiatives involve training and continued education through ICT. Although distance training is difficult, it is not impossible. New goals and initiatives are currently being explored by the national Ministry of Education to set up programmes to benefit both teachers and students. The main obstacle to overcome is the financial need.

Country Profile

Chad is a Sahelo-Saharan country of 1.28 million square kilometres. Located in the heart of Africa, Chad is bordered by Libya on the north, Sudan on the east, the Central African Republic on the south, and Niger, Nigeria, and Cameroon on the west. It is an isolated and landlocked country with a harsh climate. Its mineral-rich soil is a potential source of exploitation.[2]

There are many ethnic groups speaking various languages The population live mainly in the south of the country with a density of 54 persons per square kilometres in the Logone River basin. In the north, a desert region that is larger than France, the density drops to 0.1 persons per square kilometre. The capital city N'Djaména is situated at the confluence of the Chari and Logone Rivers; it is cosmopolitan, with a current population nearing one million people.[3]

The majority of the population works in agriculture and livestock raising. Chad's main export products are cotton, livestock, and Arabic gum. Chad started exporting oil in 2004.[4]

Table 1 provides some selected economic indicators for the country. [5]

Table 1: Economic Indicators: Chad

Indicator	2000	2004	2005
Population			$9.7 million
Gross National Income (US dollars)	$1.5 billion	$3.1 billion	$3.9 billion
Gross National Income per capita (US dollars)	$180.0	$330.0	$400.0
GDP (US dollars)	$1.4 billion	$4.3 billion	$5.5 billion
GDP growth (annual %)	-0.4	29.5	5.6
Inflation, GDP deflator (annual %)	4.8	13.3	20.0

The Education System

Chad and its partners in development have adopted a 10-year strategy called Education and Training in Liaison with Employment (EFE). This strategy is based on an orientation plan adopted in May 1990. It defines options for Chad's economic and social policy for 2000, as well as the world declaration issued in Jomtien in March 1990.[6]

The education system is organised under the following categories.

Childhood Protection Programme
The Childhood Protection Programme combines three sub-programmes:

- Children and youth in dire straits
- Orphans and abandoned children
- Supervision of younger children: kindergarten for children aged three to five years

Elementary education
Elementary education is open to children between six and 11 years old and consists of six years of study (CP1, CP2, CE1, CE2, CM1, CM2). The cycle is completed upon the CEPE examination and an entrance exam that leads to junior high school.

Literacy
The offer of literacy is limited. In 2000, there were 113,856 learners.

General secondary education
General secondary education is taught in junior high schools and high schools. These schools are open to students who have passed their primary school exams.

Technical education, professional training, and employment
The availability of training is limited. The three main employment fields are auto repair, construction, and service work (over 80% of the total of technical and professional training).

Higher education
The training provision is limited and discriminatory. Higher education and scientific research has six institutions, two of which are new. In total, there are 6,765 students, with a low proportion of women (14.2%).

Table 2 provides a quantitative perspective of some selected system indicators.[7]

Table 2: Selected Education Data

Indicator	2000	2004
Primary school enrolment (% gross)*	66.7	71.0
Secondary school enrolment (% gross)*	11.0	15.1
Tertiary school enrolment (% gross)*	0.8	...
Ratio of girls to boys in primary and	55.4	58.0

secondary education (%)**		
Total adult literacy rate (% of people over 15)	...	25.7

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**Ratio of girls to boys is the percentage of girls to boys enrolled at primary and secondary levels in public and private schools.

ICT Policies

There is no formal ICT policy in Chad. However, there is a high level of awareness of the importance of this technology thanks to the Centre National d'Appui à la Recherche (CNAR), a branch of the Ministère de l'Enseignement Supérieur et de la Recherche Scientifique, a UNDP partner. CNAR co-ordinates national research and operates an e-mail service via a direct connection to UNDP in New York.[8]

A Telecommunication Act was promulgated on August 17, 1998. As a result, a new company was established to run basic telephony, namely the Société des Télécommunications du Tchad (SOTEL Tchad), which has been granted a five-year period of exclusivity. The Office Tchadien de Régulation des Telecommunications (OTRT) is responsible for regulating the telecommunication sector. SOTEL Tchad is expected to be privatised in 2001. CLTEL Tchad and Tchad Mobile are about to be launched. Internet access had not yet been liberalised as of 2006.

Infrastructure

- Chad has been connected to the World Wide Web since November 1997 through the Bagnolet Paris node. Additional nodes are expected in Moundou, Sarh, and Abeche. ChadNet, an affiliate of SOTEL Chad, exercised a monopoly over Internet service until 2006. The use of VoIP to maximise its satellite bandwidth has reduced connection fees by 25%. In 2003, Chad had around 60,000 Internet users, 3,000 of which were subscribers.

- N'Djamena has three cyber cafés, but they suffer from slow speed and frequent power cuts. The most constraining factor is the price for connection, FCFA100 (about USD$0.20) per minute. Since it takes about 20 to 30 minutes to send an e-mail, the Internet is primarily reserved for the elite.[9]

- The fixed telephone network is monopolised by the public society SOTEL Chad. It has a network of 13,000 lines transmitted exclusively via satellite.

Table 3 provides a snapshot of the state of national ICT infrastructure in Chad.[10]

Table 3: ICT in Chad

Indicator	
Televisions per 1,000 people	1
Radios per 1,000 people	236

Fixed phone lines per 1,000 people	1
Cellular phones per 1,000 people	3
Personal computers per 1,000 people	1.6
Internet users per 1,000 people	4

ICT in Education

Inaugurated February 6, 2001, in the presence of Mme. Michele Gendreaux-Massaloux, Superintendent of the AUF, N'djamena's Centre of Access to Information has progressively been transformed into a francophone digital campus (CNF) which officially began running October 13, 2003. It is located in the University of N'Djamena Board of Education.

The CNF is equipped with three servers (DNS/Web, Backup, Parefeu) and 31 work stations distributed among the training and rooms, the Infotheque, the resource centre, and the administration offices. The following activities are carried out at the CNF:

- Training trainers to master techniques and concepts for the design of ICT projects
- ICT intensive and in-service training sessions for university staff
- Using the available platform to acquire on-line educational resources

Current ICT Initiatives and Projects

Distance education is important in the country for the following reasons:

- To upgrade and enhance the initial training that teachers receive
- To avoid having teachers miss classroom teaching time for training activities
- To respond to the needs for pedagogical training of the bulk of teachers, in particular assistant schoolmasters and community teachers
- To improve the teaching capacity of teachers in the primary and the first cycle of the general secondary
- To motivate educators and give them opportunities to work at their own pace

Ways and means are currently being explored by the National Ministry of Education to set up distance training to benefit both teachers and students. The main challenge is funding; it is hoped that the Programme to support the Renovation of Chad's Education Sector (PARSET) will be of assistance. This programme will provide certified in- service training to community teachers in some selected teacher training centres. Distance training will be the method used to ensure practical training of those teachers, supported by the Inspections of Basic Education (IEB), Centre of In-service Training (CFC), and Sectors for Teaching Support (SAP). It is hoped that the exploitation of Chad's petroleum resources will drive this vision to reality.

ENTP/ENTC
The National School of Public Works in N'Djamena (ENTP), along with the National School of Telecommunications (ENTC) in Sarh and the University of N'Djamena, are the principal institutions involved in ICT training.

The ENTP provides the following programmes:

- Basic training on the use of computers and computer tools: Windows
- Using word processing software: WINWORD
- Using spreadsheets: Excel level 1
- Using spreadsheets: Excel level 2
- Computer Assisted Drawing: Autocad level 1
- Computer Assisted Drawing: Autocad level 2

Africa Computing Association
In order to support local initiatives and to facilitate the acquisition and mastery of information technologies, the Africa Computing Association offers technical and personal capacity-building to African partners.

The Global Education and Learning Community[11]
The Global Education and Learning Community (GELC), was created in March 2004 in collaboration with Sun Microsystems Inc. Its goal is to improve education in the entire world by offering teachers, students, and parents Web content with a free code source (study and evaluation programmes), combined with the best practices for improving academic achievement for students. GELC's mission is to facilitate a first-rate education and encourage support and development of the community simply by clicking on a keyboard a mouse.

More specifically, this project focuses on developing ICT skills and local content and enhancing a national awareness of the role of ICT. This will be achieved using delivery strategies that demonstrate how ICT can support socio-economic development. The project is attaining its objectives and could easily last until 2015.

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in Chad in terms of enabling or constraining features in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation		There is no formal ICT policy in Chad.
Advocacy leadership	The Investments Code of 1987 is in the process of being	

Factors	Enabling Features	Constraining Features
	adjusted to fit the context of the Investments Charter of the CEMAC.	
Gender equity		Access between genders is unequal. The Internet is primarily reserved for the elite.
Infrastructure and access		There is insufficient development of computer technology resources. High costs continue to limit accessibility.
Learning resources		Available learning resources are still in need of development.

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ICT in Education in the Comoros

by Shafika Isaacs and Florence Ngombo
April 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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Overview

Comoros -- one of the poorest and smallest countries in the world, with a coup-prone, turbulent history over the past few decades -- Comoros boasts a national ICT policy as an expression of its government's commitment to promote improved ICT infrastructure, as well as access and usage across the education system. There are, however, very few initiatives underway that promote the use of ICTs in Comoran schools and education institutions.

Country Profile

Comoros is the third-smallest African nation by area, and one of the smallest in the world. With a population estimated at 798,000, it is also the sixth-smallest African nation by population, but has one of the highest population densities of the continent. The Comoros Islands are considered a microstate (a sovereign state that has a very small area and population).[2]

Since independence from France in 1975, the country has had a troubled history marked by a series of coups and separatist struggles. By 2002, three of the major islands were considered as part of the Union of the Comoros, although each has considerable autonomy and the fourth island remains under the jurisdiction of France.

Agriculture is the principal economic activity with crops grown both for domestic consumption and for export. The major food crops are cassava, coconut, bananas, rice, sweet potatoes, pulses, and corn. Vanilla, ylang-ylang, cloves, and copra have been the major export crops. Historically the country was the world's leading producer of ylang-ylang oil and the world's second-largest producer of vanilla. But with the decline in the price of these products, the value of these exports to the economy also dropped. There is a small tourist industry on the islands which had been recently promoted by South African interests.[3]

Comoros is one of the poorest countries in the world. Economic growth has declined since 2004, precipitated by declining investments and cash crop prices, low consumption, and rising inflation. The Comoran labour market comprises predominantly low-skilled labourers engaged in subsistence agriculture and high levels of unemployment.[4]

Table 1 provides a brief overview of the basic socio-economic indicators for the country.[5]

Table 1: Basic Economic Indicators: Comoros

Indicator	
Population (2005)	690,000
Languages	Official languages: Arabic and French. National language: Shikomoro.
2005 economic activity (% of GDP)	Agriculture: 35.1% Industry: 10.1%

	Services: 54.8%
Human Development Index (2004)	132 (out of 177 countries)
Per capita gross national income (US dollars)	$400 (2000); $560 (2004); $640 (2005)

The Education System

The Ministry of National Education, Culture, Youth, and Sports oversees the educational system of Comoros. From the age of five, all Comoran children attend Quranic schools for two to three years. Because Quranic schools are free, parents are encouraged to send their children to attend. The Comoran primary and secondary school system is modelled on the French system. All children complete eight years of schooling between the ages of seven and 15. The system provides six years of primary education, followed by seven years of secondary schooling, followed by post-secondary education which includes teacher training, agricultural education training, health sciences, and business. Because the country does not have any universities, higher education is pursued abroad.

The education system has been affected by unrest and political instability in the form of teacher strikes and student protests which have had a negative effect on the quality of education and learner performance.[6]

Table 2 provides a snapshot of education indicators in Comoros.[7]

Table 2: Education Indicators

Enrolment in primary education (% gross)*	85 (2004)
Enrolment in secondary education (% gross)*	35 (2004)
Transition to secondary	67 (2003)
Enrolment in tertiary Education (% gross)*	2 (2004)
Gender Parity Index (GPI)**	0.88 in primary; 0.76 in secondary; 0.77 at university (2004)

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**GPI = gross enrolment ratio (GER) of females, divided by the GER of males and indicates the level of access by females to education compared to males. In Comoros, the GPI suggests that there is limited gender parity at all three levels of the education system.

It is evident from the figures in Table 2 that the drop-out rate is high and that few children attend secondary school. However, there has generally been an increase in primary enrolment since the late seventies, which is partly attributable to the adoption of

the Education For All programme which led to the suspension of school fees in the Moheli Island.[8]

Adult literacy levels are low, however, with 56.5% of adults being functionally literate in 2003 (males 63.6%; females 49.3%).[9]

Infrastructure

Table 3 provides an overview of the Comoros ICT infrastrucure.[10]

Table 3: ICT Infrastructure Indicators

Indicator	
Fixed-line subscribers (2004)	15 per 1,000 persons
Mobile subscribers (2004)	9 per 1,000 persons
Dial-up subscribers (2004)	1 per 1,000 persons
Internet users (2004)	8 per 1,000 persons
Radio stations (2001)	AM 1; FM 4.

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A law authorising the liberalisation of the telecom sector and the privatisation of the Société nationale des postes et télécommunications (SNPT) or its daughter companies was approved by Parliament in 1997. Economic reform in general and reform in the telecom sector has been slow due to the political crises of the last decade.[11]

The SNPT, however, remains the sole provider of telecommunication and Internet services. SNPT has about 10 000 lines, mostly on the main island and in the capital Moroni, but also on two other islands, which are linked by analogue microwave along with Mayotte (the French protectorate). SNPT also operates the SITA network POP on behalf of the company.[12]

ICT Policies

Since 2003 the Comoran government has been involved in the development of an ICT policy[13] and strategic plan with the support of the UN Economic Commission for Africa. The National ICT Policy adopted in 2004 commits the government to developing a multi-disciplinary policy that takes into account strategic axes and nine principles. The principles are:

- Using ICT as a tool for human development and to reduce poverty
- Promoting good governance through ICT
- Facilitating the process of reconciliation and reconstitution of national unity in encouraging social and cultural interaction in society
- Taking into account regional differences
- Taking into account the gender aspect
- Adopting the regional vision on ICT
- Intensifying economic activities

- Building capacities for firms
- Promoting a new policy for co-operation and partnership

The strategic axes include building human resources capacities, which highlights the goal of connecting schools and universities with ICTs and recognises that ICTs have the potential to promote and support collaboration among students and teachers and to reduce communication and administrative costs. Activities proposed to reach these goals include:

- Teacher training in ICTs and the use of computers in teaching
- Awareness and training of education sector personnel on pedagogical applications of ICTs
- Introducing ICTs in the education system
- Designing curricula and developing software

The policy also commits the government to promoting partnerships between the public and private sectors and schools in defining the pedagogical content and mechanisms of funding.

Current ICT Initiatives and Projects

There are a few initiatives under way in Comoros. These include the following:

- The **University of the Comoros** has been included in the recently established Virtual University for Small States of the Commonwealth (VUSSC) programme promoted by the Commonwealth of Learning. The VUSSC is a network committed to the collaborative development of free content resources for education.[14] The university had 2,600 students in 2005-06.
- The **Centre National de Documentation et de Recherche Scientifique** (CNDRS) is divided into seven divisions: Archives nationales, Bibliothèque nationale, Documentation nationale, Musée national, Recherche scientifique, Production et valorisation, and Administration. CNDRS has a micro-computers and informatics training programme.
- The **Division Documentation Nationale** is responsible for the management of documentation on the Comoros and for co-ordinating the development of a national information system, external relations to CNDRS, and the process of computerising the Centre's information.
- The collections of CNDRS and the **Centre de Documentation de la Direction Générale du Plan** are both computerised.
- The **Bibliothèque Nationale** produces a bibliographic database on Comoros called BABCOM, which is based on CDS-ISIS.[15]

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in Comoros in terms of enabling or constraining features in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation	Comoros has a national ICT policy which includes consideration for the provision of access to and use of ICTs in education.	
Advocacy leadership	The national ICT policy is being promoted by the president.	
Gender equity		There is no explicit mention of commitment to women's empowerment and gender equality with reference to ICT access and use, nor are there dedicated projects and programmes in this area.
Infrastructure and access		Comoros has a very poor and under-developed ICT infrastructure and very low levels of ICT access in education institutions.
Collaborating mechanisms	The national ICT policy refers to the need for collaboration and multi-stakeholder partnerships.	
Human resource capacity		Comoros has extremely limited human resource capacity exacerbated by very high levels of illiteracy.
Fiscal resources		Comoros is strongly dependent on external donor funding.
Learning content		Not much digital education content based on the local curriculum frameworks is available in Comoros education institutions.

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ICT in Education in the Democratic Republic of Congo (DRC)

by Babacar Fall
June 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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Overview

ICT remains largely undeveloped in the Democratic Republic of Congo (DRC). This is largely because the country is still unlinked to the SAT3 underwater optical fibre cable and is thus forced to rely entirely on expensive and unstable satellite connectivity. The lack of a national policy for ICT development, and the apparent lack of concern for the subject among government officials, is not helpful. However, largely through the work of non-governmental actors (most notably COMESA, NEPAD), and Law 012/2002, ICT applications are slowly emerging. Examples of this are programmes focused on teacher training and supervision, the connection of college and university computer centres, and the multi-sector collaboration for advocacy and support of technological advancement.

Greater support from government is needed to ensure that these initiatives are expanded to improve the country's currently low levels of school participation and to reduce the major digital gaps which currently separate the north and south, urban and rural areas, and male and female populations in the DRC.

County Profile

The Democratic Republic of Congo (DRC) is situated in Central Africa, in the Great Lakes region. It extends over 2.35 million square kilometres and is the second-largest country in sub-Saharan Africa in terms of surface area, and third in terms of population. It shares 9,000 kilometres of border with nine countries: the Republic of Congo on the west; the Central African Republic on the north; Sudan on the northeast; Burundi, Uganda, and Rwanda on the east; Tanzania on the southeast; and Zambia and Angola on the south.

The DRC is situated along the equator and has an important hydrographical network dominated by the Congo River, which runs along 4,320 kilometres across the entire country.

The country has many natural resources, including the world's second-largest tropical forest, fertile soil, abundant rainfall, and various mineral resources. The exploitation of copper, cobalt, diamonds, gold, zinc, other metals, and other common minerals has constituted over the years about 75% of its exports and about 25% of its GDP.

Table 1 provides some selected socio-economic indicators for the country.[2]

Table 1: Socio-economic Indicators: DRC

Indicator	2000	2004	2005
Population	50.1 million	55.9 million	57.5 million
Population growth (annual %)	2.2	2.9	3.0
Life expectancy at birth, total (years)	42.4	43.7	--

The Education System[3]

The education system is essentially funded by parents. The rate of schooling is 52% and the general illiteracy rate in 2004 was very high at 33.2%, and even greater among women at 43.3%. Primary schooling has diminished due to the isolation of the regions, the limited revenue of parents to pay school fees, the lack of infrastructure and school materials, and the poor quality of instruction.

The duration of compulsory education is six years for children between six and 12 years of age. Although children are expected to spend three years in pre-primary school, this rarely happens except in some urban zones. Primary school is divided into three cycles of two years per cycle. The certificate given at the end of primary studies is based on evaluation of class performance and the grade awarded on a national test (TENAFEP), with proportions of 60% and 40% respectively.

Secondary education consists of one long cycle and one short cycle. The long cycle has a general, a standard, and a technical field. Students who pass the national examination, called the State Exam, receive the State Diploma that certifies the completion of their secondary studies.

The short cycle concerns professional education and consists of four years of training, beginning immediately after primary education, or three years of training after the common studies in secondary school. There are also engineering schools that offer training in craftwork for three to four years. Students who satisfy requirements for the end of this cycle receive a certificate.

Higher education is composed of a first cycle of three years and a second of two to three years, depending on the field of study. Three types of higher education are organised in the Democratic Republic of Congo: university education, advanced teacher training, and advanced technical training. The third cycle offers the degree of advanced studies (DES) and the doctorate.

ICT Policies

A defined national policy for ICT is still non-existent, but a number of initiatives are underway. Developments on the technical side include the following:

- Establishment of the ARPCT (Autorité de régulation de la poste et des télécommunications du Congo) as the regulation authority of the DRC. This is an independent entity entirely funded by regulation taxes received from service providers.
- The development of a partnership between the OCPT (Office Congolais des Postes et Télécommunications) and Korea Telecom, which will see the development of an optical fibre system to increase the capacities of telecommunications for fixed telephone service providers.

However, the more comprehensive initiative is a collaboration between government, civil society, media, and private sectors for an innovative approach and a multi-stakeholder alliance on ICT for development policy. This is known as the Multi Sector ICT Dynamic (DMTIC) with the objective of democratising access to ICTs in the DRC and transforming them into a real tool of empowerment and social development. The Web site that describes the initiative states:

The DMTIC is a non-profit-making organisation that was formed as a result of a multi-stakeholder roundtable organised in January 2005 in Kinshasa. The roundtable brought together representatives from government, business and the non-profit sector for the first time in the DRC, to identify key issues that could be included in the development of a national ICT policy. This roundtable was initiated by 'Alternatives', a Canadian non-governmental organisation, in collaboration with the Association for Progressive Communications (APC), the International Development Research Centre (CRDI-Canada), and the 'Catalysing Access to ICT in Africa, (CATIA) programme. The outcome of the meeting was the setting up of a strategic plan for the DMTIC.[4]

Infrastructure

Table 2 provides a snapshot of the state of national ICT infrastructure in the country. [5]

Table 2: ICT in Democratic Republic of the Congo

Indicator	
Population (in millions)	53.8
Literacy rate	64.1
Gross national product per capita	90
Televisions per 1,000 people	2
Radios per 1,000 people	386
Fixed telephone lines per 1,000 people	0
Cell phones per 1,000 people	3
Personal computers per 1,000 people	-
Internet users	6,000

In the service sector in the DRC, telecommunications is a priority and has had an impact on the gross domestic product with the expansion of the mobile telephone network. From a few thousand subscriptions before 2000, there are currently more than 3.5 million subscribers out of a population of about 60 million, for a telephone density of 5.8%. Before 2000, the telephone density was 0.06%.

The arrival of many competing service providers in the market has extended the network to remote rural zones. Due to political instability, the mobile telephone networks are decentralised (e.g., TATEM TELECOM (Congo Telecom) initially operated only in the port city of Matadi).

ICTs in Education

A national policy on ICT use in education was launched in 2004 within which two main priorities were identified: the Internet network and electronic governance. These priorities are reflected in action at three levels: university, basic education, and community.

University level
At the university level, the following initiatives have been taken:

- The Virtual Francophone Campus works to unite higher education institutions through the organisation of distance training sessions and the facilitation of research in the fields of science and technology.
- Education For Change (EFC) consultants have been engaged by Vlaamse Interuniversitaire Road University Development Cooperation (VLIR-UOS) and Conseil Interuniversitaire de la Communauté française de Belgique – Commission Universitaire pour le développement (CIUF-CUD) in Belgium to identify needs and opportunities to strengthen ICT capacity in the DRC through a transversal programme involving seven universities. This will draw on lessons from the experience and results of existing and ongoing work at the Universities of Kinshasa (UNIKIN) and Lubumbashi (UNILU). The work also seeks to facilitate networking among a variety of teaching and research programmes.[6]
- The University of Kinshasa and a group of dedicated teachers enacted a programme to interconnect all Congolese universities. Using an optical fibre backbone, their project now serves 10 Unikin establishments. It aims to prevent the continued departure of university specialists, as well as to meet the growing demand for distance training programmes. The project was made possible by a grant from Belgium.
- The Polytechnic faculty serves as the regional platform for the Cisco Academy and provides hosting for students from Congo Brazzaville, the DRC, and other surrounding countries.

Basic education

With only 56% literacy among the DRC's female population, USAID has placed women and girls at the forefront of all education improvement and disbursement efforts, and has used technology as the primary tool. With the Internet and radio, for example, USAID has helped to create, not only teachers (by way of technologically based teacher-training programmes), but also learners (through their many broadcasts that stress the importance of girls' education). This vision is further facilitated through the provision of scholarships to the community's most vulnerable female students. (In the 2003-04 school year over 11,000 girls received such support.)[7]

Communities

- *The Community Resource and Learning Center: a bridge between community and schools*
  On July 12, 2003, the Community Resource and Learning Center (CRLC) of Vanga (a rural community of approximately 3,000 people on the banks of the Kwilu River in Bandundu Province) was opened. After months of investment by community members, the dot-EDU team (the Education Development Center), the Academy for Educational Development (AED), and The Mitchell Group (TMG), the CRLC now houses a training room as well as a computer room equipped with 15 computers, three printers, two digital cameras, two digital video cameras, two digital audio recorders, a television, an LCD projector and other multimedia equipment. Using VSAT technology, all computers were networked and Internet-ready.

  The Center provides the necessary infrastructure to train health and education workers, community members, and primary school children in the use of ICT. In addition, six community members have been trained for management and maintenance. As girls and women are often marginalised with respect to ICT use, special outreach efforts are targeting female students, teachers, and community members. Some modules (French, mathematics, biology) have been developed for teacher training and to supplement existing lessons plans. Based on the YouthLearn methodology for youth development

programming, these modules affirm the centrality of project-based activities, collaboration, and exploration. In addition, these highly interactive and possibly Web-based materials are designed around existing community needs and capacities and fashioned in a way that allows for their use both in and outside the classroom.[8]

- *Using ICT to address chronic information shortages*
  Like other areas in the DRC, the Vanga Mission has suffered from a steady decline in the education system, lack of paid teachers and new materials, few up-to-date pedagogical methods, and a shortage of copies of the national curriculum. USAID/DRC provided pilot funds to use ICTs to address these issues and identify innovative means of improving the quality of basic education. USAID/DRC, through dot-EDU, its partners, and the Center in Vanga, are also using the Internet to provide local hospitals with access to otherwise unavailable information.[9]

Current ICT Initiatives and Projects

In terms of major initiatives to welcome more people into the Information Age, ICT training seems to be particularly dynamic. For example, some primary schools are making an effort to orient their students towards computer technology at an early age. As well, there are several private training centres in the capital that offer short courses on network management and developing Web servers and on-line databases. In this model, there is a real market in technology training to meet a high demand.

Other initiatives include the following:

Linking universities
The linking of Universities of Kinshasa and Lubumbashi to reliable VSAT connections through a VLIR-funded (Free University of Brussels/Belgium) project has opened the doors to new research opportunities for both universities. However these links are costly. Contacts have been made recently with the African Virtual University (AVU) to find ways of decreasing costs. Kinshasa and Lubumbashi are separated by a distance of approximately 1,600 kilometres, and there is currently no plan to cover this distance by fibre.

Kinshasa has one of the largest universities of the country and there are several other private and public organisations that provide good quality education nearby. These include:

- Protestant University of Congo
- Catholic Theological Schools of Kinshasa
- Advanced School of Applied Science (Institut Supérieur des Techniques Appliquées) Optical Fibre for Education and Research Networks in Eastern and Southern Africa
- Advanced School of Commerce (Institut Supérieur du commerce)
- Advanced School of Building and Civil Engineering (Institut de bâtiments et des travaux publics (IBTP))
- Pedagogical Institute of Gombe (Institut Pédagogique de la Gombe (ISP Gombe))
- LIFASIC

These institutions are located in close proximity making interconnection by fibre realistic in the near future. Accordingly, the first steps are being taken to connect UNIKIN (University of Kinshasa) to the Kinshasa Internet Exchange and agreements have been made to use UNIKIN as a hub for the other institutions.[10]

Virtual universities
The Virtual African University (UVA) and the Francophone Academic Agency (AUF) have set up the Virtual Francophone University (UVF). This allows its users to share academic resources formulated in French using a network established by the partnership.

CAFEC
As of early 2005, the African Centre of Cultural Exchange (CAFEC) worked in close collaboration with some Congolese organisations (ASSIC, JUSDATA, etc.) to set up a Congolese action for the popularisation of ICT. This has won the support of Alternatives, a Canadian NGO settled in the DRC for almost three years. CAFEC also managed to create the National Network of Congolese NGOs for the Promotion of ICT (REPRONTIC), which currently involves 23 Congolese NGOs and is a source of much interest from PNUD/DRC. The Alternatives organisation in the DRC also carries out activities in ICT in collaboration with the Multi-sector Dynamism for ICT (DMTIC), which gathers representatives from the public, private sector, and civil society.

Congo Skill
Congo Skill is a non-profit organisation that aims to increase computer literacy in the DRC and other African countries. Congo Skill is the state official representative in the ECDL Foundation (European Computer Driving Licence) based in Ireland. This organisation manages the PICI (International Passport of Competences in Data Processing) at a higher level. ECDL intervenes in Europe and ICDL outside Europe. The IPCD (International Passport of Competences in Data Processing) ensures essential basic competences for sustainable autonomy and productivity. It provides a remarkably high level of adapted computer-related skills and knowledge through a series of modules leading to a certification in fields considered as fundamental.

The Aden Project
As a key instrument in the French co-operation policy for digital gap reduction, ADEN has implemented digital inclusion programmes in 11 sub-Saharan French-, English-, and Portuguese-speaking countries for the period 2003-2008. Provided with a budget of six million euros, it has three goals: democratising access to ICT; training local populations; and supporting the Internet uses, contents, and applications for development.

Four centres have already been founded: one in Delvo of Butembo, another in UCG Butembo, a third in Kimpese, and the last in Kisangani. These centres are resources for the masses eager to access the Internet, but constant problems are experienced such as poor electrical power provision, low attendance due to the population base being away from the centres, and faulty computer materials and accessories.

iEARN
iEarn in DRC intervenes by:

- Teaching students how to use computers
- Enabling students to break out of isolation and become exposed to the global network to express themselves
- Deconstructing the myths surrounding computers and the Internet
- Allowing students to fully access and enjoy knowledge through ICT

APEFE
The Association for the Promotion of Education and Foreign Training (APEFE) has created a technical training unit inside the Institute of Technical Teaching in Kinshasa (ISPT Kin).

RESOP
The Open Network for Teaching Resources (RESOP) project provides "a network of teaching resources for teachers training with a view to reshuffling and readapting the national system" in the DRC. UNESCO manages this project while the French society provides the distance training means.

Easy Tec
Easy Tec is a Kinshasa-based organisation that promotes ICT training, offers maintenance services for computers and computer equipment, helps create Web sites, and provides network administration and software development (billing, accounting, cash flow, payroll, staff development, stock development, etc.).

Implementing ICT in Education: What Helps and What Hinders?

Table 3 provides a summary of the current stage of ICT development in the DRC in terms of enabling or constraining features in the education system.

Table 3: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation		A non-existing national policy, and the apparent lack of concern on the part of the government for the development of ICT signals a weak perception of the possible impact of these technologies for the country's welfare.
Advocacy leadership		Local suppliers have not benefited much from the national backbone, and the central authorities seem currently unconcerned with the development of the sector.
Gender equity		There exists gender inequity to ICT access as well as inequality between rural and urban areas.
Infrastructure and access	The networks that unite university and college institutions with the common goal to facilitate access to information and provide training are of great importance for the reinforcement of the quality of executives' training.	The DRC is not linked to the SAT3 underwater fibre-optic cable, and access to the Internet relies solely on satellite, and is thus very expensive and unstable.
Policy and collaborating mechanisms	The mechanism of collaboration between government, civil society, media, and private sectors is an	

Factors	Enabling Features	Constraining Features
	innovative approach and a multi-stakeholder alliance on ICT for development policy.	
Human resource capacity	Expand further training to widen access.	
Fiscal resources		School fees need to be lowered and adapted to the ability to pay by the local population.
Learning resources	ICT is slowly making its way into the classrooms, largely through the work of non-governmental actors.	In terms of the teaching of technologies, the situation is little more than at its beginning stages.

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ICT in Education in the Republic of Congo (Congo-Brazzaville)

by Babacar Fall

June 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

The findings, interpretations and conclusions expressed herein are entirely those of the author(s) and do not necessarily reflect the view of *info*Dev, the Donors of *info*Dev, the World Bank and its affiliated organizations, the Board of Executive Directors of the World Bank or the governments they represent. The World Bank cannot guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply on the part of the World Bank any judgment of the legal status of any territory or the endorsement or acceptance of such boundaries.

It is expected that individual *Country Reports* from the *Survey of ICT and Education in Africa* will be updated in an iterative process over time based on additional research and feedback received through the *info*Dev web site. For more information, and to suggest modifications to individual *Country Reports*, please see www.infodev.org/ict4edu-Africa.

Overview

The Republic of Congo has recently developed an official ICT policy co-ordinated by the Committee for the Promotion of Information Technologies in Congo (COPTIC). One of the priorities is to set up a national plan for ICT infrastructure, the lack of which, along with the high cost of computer products and services, is hindering the development of ICT applications in several social sectors, including education. A recent lowering of custom fees has helped to alleviate the problem somewhat. Several distance education initiatives are being developed to provide students and businesses in the Congo with an opportunity to access advanced quality training.

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Country Profile

Congo-Brazzaville, or the Republic of Congo (as opposed to Congo-Kinshasa or the Democratic Republic of Congo), is an equatorial African country bound by the Atlantic Ocean and Gabon on the west, Cameroon and Central African Republic on the north, and the Democratic Republic of Congo on the east and south.

Congo-Brazzaville extends over 1,300 kilometres from the north to the south, from the Atlantic Ocean to the Central African border along the Congo River. Its natural resources (water, forest, and minerals) are plentiful but poorly exploited due to the low population.[ii]

Congo's petroleum resources are administered by a state petroleum company (National Society of Petrol of Congo or SNPC). Since 1976, oil refinement has been based in Pointe-Noire, the economic capital of Congo, which accounts for 90% of the state revenue and constitutes the same percentage of exports.

Table 1 provides some selected socio-economic indicators for the country.[iii] Table 2 offers some comparative date on population and education.[iv]

Table 1: Socio-economic Indicators: Republic of Congo

Indicator	
Area	341,821 km^2
Capital	Brazzaville
Population (2005)	4 million
GDP per capita (2006)	$1,300 (2006)
GDP growth rate in 2005	+7.7%
Expected GDP growth rate for 2006	+6.6%
Inflation in 2005	+3.0%

Table 2: Population and Education Data

Indicator	2000	2004	2005
Total population	3.4 million	3.9 million	4.0 million
Population growth (annual %)	3.2	3.0	2.9
Total life expectancy at birth (years)	51.4	52.5	...
Total fertility rate (births per woman)	6.3	6.3	...
Infant mortality rate (per 1,000 live births)	81.0	81.0	...
Total HIV prevalence (% of population, ages 15 to 49)	...	...	5.3
Total primary completion rate (% of relevant age group)	...	66.4	...
Primary school enrolment (% gross)*	72.7	88.7	...
Secondary school enrolment (% gross)*	32.4	38.6	...
Tertiary school enrolment (% gross)*	5.0	...	...
Ratio of girls to boys in primary and secondary education (%)**	84.5	90.2	...

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**Ratio of girls to boys is the percentage of girls to boys enrolled at primary and secondary levels in public and private schools.

The Education System

The Congolese education system is regulated by law 25/95 (November 17, 1995), modifying School Law 008/90 (September 6, 1990).[v]

The education system consists of the formal and the non-formal sectors and is divided into the following four levels:

- Optional pre-school education, three years
- Primary education lasting six years ending with a final diploma: the Certificate of Primary and Elementary Studies
- Secondary education, assured by trade centres and educational institutions (Also included in this level is general secondary education in technical secondary schools and professional secondary schools. Secondary education from six to seven years is divided into two cycles: the first lasts for four years, and the second lasts from two to three years.)
- Higher education offered at Marien Ngouabi University made up of 11 institutions: five colleges, three schools, and three institutes

ICT Policies

According to the United Nations Economic Commission for Africa (UNECA), only Congo Brazzaville currently has a real policy in terms of ICT, co-ordinated by the Committee for the Promotion of Information Technologies in Congo (COPTIC).

The 1997 law abolished the monopoly of the National Office of Telecommunications (ONPT), beginning an era of liberalisation of the telecommunication sector. The National Plan for Information and Communication Infrastructure (NICI) has been completed. The General Management of Central Post Administration (DGACPT) is the telecommunication regulation authority.

This plan states the national priorities concerning telecommunications and develops an institutional framework for the public policies in the subject. The statutory context is evolving towards the privatisation of SOTELCO, the Congolese Office of Post and Telecommunications (OPT).

Infrastructure[vi]

The telecom infrastructure is at a very low level of development. The Société de Télécommunications du Congo (Sotelco) is the main provider of basic telecommunication services.

The licensing system for VSAT in the Congo uses a novel strategy: Sotelco can be designated as the recipient for the satellite circuit charges, in which case it adds 5% before passing them on to the user. Alternatively, if Sotelco is not included in the arrangements, an annual licence fee of about USD$8,000 is required, as well as a monthly fee of about USD$3,300.

Lack of sufficient international bandwidth is still a major problem for many countries, including Congo-Brazzaville, which has less than 256 kbps. There are currently only 200 dial-up Internet subscribers and one Internet service provider in the country.
The Republic of Congo hosts one of the Regional African Satellite Communications (RASCOM) projects (http://www.rascom.org/index.html) which was born at the end of the 1980s. This organisation aims to meet African countries' telecommunication needs by constructing a specific satellite system. Supported by UNIDO and UIT, the project has developed rapidly. ALCATEL SPACECOM has been appointed as a partner and ALCATEL SPACE was given the task of building the first satellite. It has now been completed and was launched in March 2006.

Congo is connected to the global network only by VSAT because it is not linked to the SAT3 cable. Congo has five Internet service providers:[vii]

- SOTELCO
- Afripa Telecom (www.afripatelecom.net/)
- Celtel Plus (affiliate of CELTEL Congo)
- Gam 7
- Raga (http://www.raga.net/), which operates through VSAT from Kinshasa

The Internet is provided through the satellite with a bandwidth of 64 kbps and by Wi-Fi through the Local Loop Radio (BLR). Therefore, the connection is rather slow.

The United Nations for Development Program (UNDP) is planning a project for installing an Internet node in Brazzaville.

Cyber cafés have had rapid success, with low connection fees (between 0.75 and 2.30 euros per hour).The number of Internet users is about 5,000, according to a 2002 UNDP estimate, while the telephone density is about 0.6% for fixed lines and 14% for mobile. In 2004, the number of Internet users was up to 36,000, and the estimated number of PCs was about 17,000.

Table 3 provides a snapshot of the state of national ICT infrastructure in the country. [viii]

Table 3: ICT in the Republic of Congo

Indicator	2000	2004
Telephone main lines (per 1,000 people)	6	2
Mobile subscribers (per 1,000 people)	20	115
Population covered by mobile telephony (%)		65
Internet users (per 1,000 people)	0	4
Personal computers (per 1,000 people)	3	4
Households with television (%)	6	6

ICTs in Education

Although it is obvious that equipping schools with information technology is becoming an urgent necessity, whether at the administrative or instructional level, tremendous means are required to meet this need. Software and standard operating systems such as Windows dominate, even though Space Creators and the Committee for the Promotion of Information Technologies in the Congo (COPTIC) urges the government to adopt the free Linux software.

The Republic of Congo faces a serious lack of telecommunication infrastructure, which hinders the development of several social sectors such as education. At the celebration of the national days of telecommunication, some recommendations were given, mainly, to develop distance learning programmes to back up training and harmonise international collaboration in order to reinforce local expertise for further training of the Congolese population.

Current ICT Initiatives and Projects

In Congo, distance training is an opportunity offered to students of all levels and to companies to equalise access to high-quality training in order to promote global development. Three projects, all dealing with distance learning, are currently being set up with the assistance of the Francophone University Agency, the Swiss Qualilearning Company, and an Italian Engineering System respectively.

Francophone Virtual Campus
Started in December 2003, this project is in process of completion. It is being installed with the assistance of the Francophone University Agency (AUF). Its aim is to set up the premises and check the conformity between the existing parts and the electric current supply. The Internet signal bandwidth used now at the university is very narrow and does not fit the installation requirements of this campus, which means the university has to make the premises and furniture available so that the AUF can bring in the necessary expertise and material.

CoseLearn
The CoseLearn project is implemented by the Swiss Qualilearning Company with assistance from the Swiss Agency for Development and Cooperation (SDC). The main objective of the project is to promote distance and e-learning in selected French-speaking countries in Africa by progressively implementing a virtual campus in partner universities.

FAD
The FAD (distance training) project is an initiative of the Italian engineering system company S.N.C. in partnership with AZUR Development, a Congolese NGO. The aim of the project is to set up centres and offer distance training in real time. There will be 10 centres established each with 15 work stations and a video-conferencing room. The project is receiving assistance from the EU, the Italian Cooperation, and some French and Italian universities. Courses already available include computer science and business management.

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in the Republic of Congo in terms of enabling or constraining features in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation	The National Plan for Information and Communication Infrastructure (NICI) has been completed.	No ICT in education policy exists.
Gender equity		Inequality in access exists between the genders.
Infrastructure and access	Local telecommunication providers offer Congolese people access to the Web and many opportunities to remove themselves from isolation.	Energy sources in rural zones are lacking and there are weak telephone networks.
Human resource capacity		There are insufficient numbers of people with ICT skills.
Fiscal resources	Customs tariffs on computer equipment have been temporarily waived.	Finances are scarce and the high cost of equipment is high. .
Learning resources	The Internet makes valuable public and private services accessible to all users because there are no physical barriers. It also reinforces the openness to the world as well as the national heritage identified as important database available on the Web.	

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ICT in Education in Côte D'Ivoire

by Babacar Fall
June 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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Overview

The development of ICT in Ivorian colleges, universities and teaching institutions is expected to revive distance training, the exchange of training programmes relating to technology, improve access to computer equipment, and play a leading role in a more large-scale and efficient integration of ICT in the education system.

The main challenges to the use of ICTs in education in Côte d'Ivoire are the lack of necessary infrastructure, computer equipment, qualified human resources, and the high cost of ICT materials. Large disparities in access to equitable educational opportunities between genders, ethnicities, and regions needs to be remedied. Despite these obstacles, the gradual adoption of training programmes, public and private initiatives, and other activities are contributing to the achievement of a realistic vision.

Country Profile

Côte d'Ivoire is a West African country with an area of 322,000 square kilometres. It is bordered by Mali and Burkina Faso to the north, by Ghana to the east, and by Guinea and Liberia to the west. It has 550 kilometres of coastline along the Atlantic Ocean to the south. Its official capital, Yamoussoukro, is located at the country's centre, and its principal commercial centres are Abidjan and San-Pédro, on the Gulf of Guinea, and Bouaké, in the centre.

Table 1 provides some selected socio-economic indicators for the country.[2]

Table 1: Socio-economic Indicators: Côte d'Ivoire

Indicators	
Area	322,463 km^2
Population	18.1 million
Population growth rate	3.4%
Life expectancy	46.0 years
Human Development Index	164 (out of 175 countries)
GDP (US dollars)	$15.5 billion
GDP per capita (US dollars)	866
Growth rate (2005):	1.8%
Literacy rate	50.7%

The Education System

Côte d'Ivoire has set up a national plan for the development of education and training within the time span 1998-2010 (PNDEF). This plan integrates important structural reforms:

- In primary education, to achieve universal schooling
- In secondary education, to thoroughly train and prepare students for the workforce or higher education
- In higher education, to improve the quality and efficiency to train and prepare students for entering a career, primarily in the private sector

In 2002, Côte d'Ivoire had about three million students, 73% of whom were in primary school, 17% in middle school, 5% in high school, 1% in a trade or technical school, and 4% in a college or university. This has been accomplished thanks to the financial effort made by the government and partnerships with the private education sector. There are still some significant challenges in addressing the educational needs of a continually growing population.

Table 2 summarises the number of students and teachers in the education system.

Table 2: Rate of Schooling[3]

Primary Education			**Secondary Education**		
Number of students					
Boys	1,162,300	**56.78%**	Boys	414,871	**64.78%**
Girls	884,561	**43.22%**	Girls	224,589	**35.22%**
Total	**2,046,861**	**100%**	Total	**639,460**	**100%**
Number of teachers					
Males	35,325	**79.52%**	Males	18,103	**87.15%**
Females	9,099	**20.48%**	Females	2,672	**12.85%**
Total	**44,424**	**100%**	Total	**20,775**	**100%**

ICT Policies[4]

In the 1970s, Côte d'Ivoire decided to bridge the digital gap to keep up with the development of computers and related technology. The Ivorian government considers ICT to be a priority and has conceived a national strategic plan for the development of ICT infrastructure. This plan identifies five strands in of ICT development:

- Infrastructure development
- Access
- Training
- Digital content development
- Legal and regulatory aspects

A co-ordination and follow-up mechanism was later introduced at the governmental, private, and civil society levels. To implement the plan, the Ivorian government has created the Ministry for Communication and Information Technology even though the national ICT policy still remains unclear. Different bodies in charge of regulating and overseeing developments in the sector have been instituted, but lack a clear description of role and mandate. While a policy in education has s not yet been formulated, a policy for the integration of computer technology in education was approved in April 2001.

Telecommunication regulation operates at two levels:

- The Côte d'Ivoire Telecommunications Agency (ATCI), whose members are appointed by the Ministry of Communication and Technology
- The Côte d'Ivoire Telecommunications Council (CTCI), which intervenes in the event of appeals

Very often, decisions from these two regulatory bodies contradict each other, much to the despair of operators. To remedy this situation, the creation of a mediation and conflict resolution body is envisioned.

Infrastructure

The telecommunications network in Côte d'Ivoire is characterised by a low telephone density and significant geographical disparities between Abidjan and the interior on one hand and urban and rural areas on the other. The rate of telephones per 100 residents was about 2.5% in 2001-2002 and reached 10% in 2005 (in 1995, it was 0.82%). In rural zones, this rate rose only from 0.1% to 0.7% between 1995 and 2000, and to 1.5% in 2005. Only 40% of the demand for telephone lines was met in 2001-2002.

Côte d'Ivoire has been connected to the Internet since 1996 through the Leyland link. Currently this link operates at 256 kbps towards the US through MCI, at 1 Mbps towards France through France Telecom, and at 256 kbps towards Canada through Téléglobe. There are six Internet service providers (ISPs). On May 31, 2002, these providers had 15,354 subscribers through RTC, 105 through RNIS, and 108 through special connections.

Tables 3 and 4 provide a snapshot of the state of national ICT infrastructure in the country.

Table 3: Telephone and Internet Usage[5]

	Users (2001)	**Users (2002)**	**Users (2003)**
Fixed telephone lines	293,568	332,970	238,000
Cellular	730,445	1,027058	1,239,131
Internet	13,934	10,509	12,213

Table 4: Communication density[6]

Indicator	

Televisions per 1,000 people	60
Radios per 1,000 people	183
Fixed telephone lines per 1,000 people	18
Cellular phones per 1,000 people	45
Personal computers per 1,000 people	7.2
Internet users (in thousands)	

ICTs in Education

The education sector in Côte d'Ivoire is the first one in Africa to implement beneficial Internet applications. Multimedia enhanced education, distance training, and distance research of scientific information are important assets for those seeking to advance their knowledge.

It is clear that the computerisation of institutions, especially those in development or teaching, is becoming an urgent need, but it will be an arduous process. Some schools now offer training in computer management and networks, but there is further need for quality training programmes for technicians and engineers.

The primary institutions that offer training programmes in ICT are:

- National Institute of Technical Education (INSET): Offers training in ICT and runs the School of Tertiary Technology (ETT)
- National Polytechnic Institute- Houphouet-Boigny (INP-HB): Runs several schools that feature ICT programmes
- African Institute for Economic and Social Development (INADES): Offers training in IBISCUS programmes to help libraries/resource centres use ICT
- National Academy of Extension and Telecommunications (ENSPT)
- National Higher Technical School (ENTS)
- Centre for Continued Training (CFC)

Some private and public educational institutions have, however, launched some initiatives towards the integration of ICT in teaching:

- Gateway to the Information Superhighway for Youth, a project supported by the institute of new technology in information and training (intif.francophonie.org)
- The Internet Resource Center of the Distance Education Center of Côte d'Ivoire (CED-CI), part of the World Bank's GDLN network (The CED-CI specialises in continued training administered by Côte d'Ivoire, with technical, instructional, and financial support from the World Bank. It offers the exchange and sharing of knowledge through video-conferences and e-learning.)
- Occasional private initiatives to promote ICT (Internet Day Celebration, for example)
- SchoolNet Côte d'Ivoire, a branch of SchoolNet Africa (www.schoolnetafrica.net)

While a number of ICT projects exist within higher education, elementary and secondary schools remain largely marginalised because of the low priority accorded to social issues by current policies.

The regional centre for computing, Centre Informatique Régional de Côte d'Ivoire, (CIRC) under the supervision of the Ministry of Technical Schools and Vocational Training, is responsible for ICT in the academic and research sectors.

Current ICT Initiatives and Projects

MEN/DIPES/SDGI: Ivorian School Computer Project, 2006-2007
The Direction of Computing, Planning, Evaluation and Statistics (DIPES) under the supervision of the Central Filing and Computer Management office (SDFCGI) is experimenting with computer-related technologies in 29 pilot schools for the academic year 2006-2007. The activities of this programme include:

- Offering an ICT skills course in an ordinary classroom with hands-on training in a computer lab
- Computer skills training for teachers
- Equipping the pilot schools
- Defining an ICT curriculum for learners
- Guidance and support for the local co-ordinating committee.

For more information: www.simenci.org

Ciscolabs
Ciscolabs and NetSolutions is a new enterprise aims to reduce the digital gap by taking advantage of regulatory changes underway in West Africa and Senegal.

BAOBAB Cyber Villages
The BAOBAB Company was established to develop a network of ICT service centres in sub-Saharan Africa. BAOBAB has a collective approach to improving access to ICT tools among associations, co-ops, small businesses, and liberal professions. It also develops relevant content for users.

Assafad
Côte d'Ivoire is the seat of Assafad (African Association for African Training). It hosts several projects in tele-education and is also involved in the francophone project Olympus. It acquired equipment a few years ago and faculty were trained as specialists in distance education. But like all the francophone countries that benefit from grants and financial aid from the Francophone Communities Agency, training has been in steady decline since 1998.

Implementing ICT in Education: What Helps and What Hinders?

Table 5 provides a summary of the current stage of ICT development in Côte d'Ivoire in terms of enabling or constraining features in the education system.

Table 5: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation	The Ivorian government considers ICT a priority and has conceived a national strategic	There is an absence of well-thought-out policies, and effective projects for the integration of ICT

Factors	Enabling Features	Constraining Features
	plan for the development ICT infrastructure.	in schools.
Advocacy leadership		The political crisis prevailing does not help for the advocacy of ICT promotion.
Gender equity		Girls and women have little access of to ICT due to under-schooling.
Infrastructure and access		Equipment is lacking in education institutions; limited Internet access for large numbers of people in urban and rural areas; and no fast access to reliable and high-cost Internet service.
Policy and collaborating mechanisms	A leading policy scheme is available at the ministry level for computer-related technologies that facilitates access to information.	
Human resource capacity		Human resources in ICT are undeveloped.
Fiscal resources		Computer equipment is costly, partially because of customs taxes.

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Overview

Djibouti boasting a digital telecommunications network and connections to the rest of the world through undersea optical fibre that are much admired in the region. Two-thirds of the population is urban, and ICT services are readily available in urban areas . The country has a good relationship with most western donors. All these factors support Djibouti's efforts to modernise their education sector.

With an ongoing reform programme, Djibouti has mostly focused on developing and improving the physical infrastructure and other non-ICT resources, including building new classrooms and providing textbooks. In higher education, a key focus has been on producing skilled teachers and encouraging out-of-school youths to get vocational training. At a policy level, ICT is a component of the national ICT policy, which was developed by the Ministry of Communication. Djibouti needs a sector-specific policy for the adoption of ICT in education, together with an implementation plan that will take advantage of the available enablers including the telecommunication network.

Country Profile

Djibouti is strategically located on the northeast coast of the Horn of Africa, separating the Red Sea from the Gulf of Aden. Small in size, Djibouti is bordered by Eritrea to the north, Ethiopia to the west and southwest, and Somalia to the south. The country is one of the newest in Africa having gained independence from the French in 1977, changing its name from the French Somaliland to Djibouti.

Djibouti covers a land mass of 23,000 square kilometres with a 370 kilometre coast line. The economy is based on service activities connected with the country's strategic location and status as a free trade zone in northeast Africa. Two-thirds of the inhabitants live in the capital city; the remainder are mostly nomadic herders. Scanty rainfall limits crop production to fruits and vegetables, and most food must be imported. Djibouti provides services as both a transit port for the region and an international transhipment and refuelling centre.

Table 1 provides some selected socio-economic indicators for the country. [1,2]

Table 1: Socio-economic Indicators: Djibouti

Indicator	
Population	779,000
Languages	French, Arabic, Somali, and Afar
GDP per capita (US dollars)	$1000 (2005)
Human Development Index	Position 148 out of 177
Human Poverty Index	52 (out of 102 countries)
Expenditure on education (% of GDP)	20.5%

The Education System

The education sector is a priority for the Djiboutian government, accounting for 20.5% of its budget. The policy for the education system and its plan of action for 2006-2008 comply with two targets of the Millennium Development Goals (MDGs): to ensure that by 2015 children everywhere will be able to complete a full course of primary schooling and that girls and boys will have equal access to all levels of education.

Table 2 provides a quantitative perspective of some selected system indicators.

Table 2: Selected Education Statistics

Indicator	
Net primary enrolment	39% (2004)
Net secondary enrolment	22% (2004)
Gross tertiary enrolment	2% (2004)
Adult literacy	67.9%

The Djibouti educational system was originally developed to meet a limited demand for education. It is essentially elitist in its design and borrows heavily from the French system, which stood isolated from its environment and was not adapted to the country's realities. Efforts deployed during the 1990s have resulted in an increase in enrolment, but it is still below people's expectations and the needs of a developing nation.

In 1999 the government revisited its educational policies and launched a consultative process that included all players (administration, teachers, parents, national assembly, and NGOs). The process led to wide consensus regarding the sources of the problems and recommendations for the policies needed to address them. Building on the consensus and the recommendations that followed, the government developed a 10-year master plan for education (2000-10). In August 2000 it passed an Education Planning Act and prepared a medium-term plan of action (2000-05).[3]

The Education Planning Act represents a considerable departure from the old system. A restructured fundamental education system comprised of nine years (five years of primary education followed by four years of middle school) is now mandatory. Entry into the secondary educational system of three years requires a Certificate of Fundamental Education. The Act has also introduced secondary-level vocational education and has established university facilities in Djibouti.

Since the medium-term development plan and the Planning Act were implemented, noticeable progress has been achieved at all levels of education, thanks to the mobilisation of external and internal resources for the financing of construction, equipment purchases, and teacher recruitment.

Government strategy covers basic education, vocational education, secondary education, higher education, adult education and, in particular, women's literacy. Specifically, every field of intervention focuses on five strategic objectives aimed at improving and strengthening access: equity, quality of education, institutional capabilities, managerial capabilities, and partnerships.

There are 81 public primary schools in the country, 24 registered private primary schools, 12 secondary schools and two vocational schools. An estimated 73% of eligible primary school children do not attend school.[4,5] Only 8% of first graders will eventually reach the 12th grade. Girls' enrolment is more than 10% lower than that of boys.

Teacher attrition is very high and new teachers are scarce. The local teacher-training institute is unable to graduate more than 130 teachers per year. Textbooks are inadequate and there are not enough of them: on average, 20 primary school students will share a math textbook and three will share a French text. Several international agencies have come in to assist the Ministry of Education with its reform programme which aims at improving access and the quality of education. Some of the organisations involved in the Djibouti education sector include USAID, UNICEF, and the French government through the framework partnership between France and Djibouti.[6]

Infrastructure

National

Djibouti has an almost unique telecommunications network in Africa, with two earth stations and a landing point of three submarine cables linking Asia to the Middle East and Europe that gives it a key role as master station and traffic node. However, the country has not benefited from these assets. Telecommunications traffic and revenues have remained lacklustre for over a decade because of high tariffs and considerable delays in introducing new products.

The institutional and regulatory framework that governs this activity has not evolved either, in spite of major changes and transformations (liberalisation, privatisation, regulation) at the international level. Since ICTs are essential to the country's competitiveness and to its fight against poverty, the Ministry of Communication and Culture, which is in charge of posts and telecommunications, conducted an ICT awareness campaign beginning in May 2002. This resulted in a broad consensus and helped develop guidelines for a national policy on new technologies.[7,8] The main objectives are to:

- Increase access to the new ICT services
- Further reduce telecommunication costs in order to increase Djibouti's external competitiveness
- Strengthen the role of telecommunications as a regional integration factor
- Fight poverty and promote employment by developing activities linked to ICT

The strategy was adopted by the counsel of ministers followed by the parliament. Its 10 objectives are as follows:

- Universal access (means of access for all to ICTs)
- Increased capabilities in human and logistical resources, especially in the field of education and research
- Modernisation of the state administrative apparatus
- Strengthening of institutional, legal, and governance capabilities
- Increased use of ICT capabilities to help grow the private sector and create a regional hub
- Development of digital content as well as Djibouti's Web presence
- Modernisation and strengthening of the public health care system
- Management of the environment, disasters, famines, and other ills using ICT
- General motivational activities to strengthen the ICT sector action plan
- Research development.

This 20-year ICT strategy, together with an action plan of over 30 projects, is meant to help transform the country while trying to deal with the fundamental issues of poverty, literacy, access to education and health services, and community development (community access centres and community radio) as well as the challenge of transforming and modernising the economy, government, and society in general using ICTs.[9]

Table 3 provides a snapshot of the state of national ICT infrastructure in Djibouti.

Table 3: ICT in Djibouti

ICT	
Telephone lines	11,100 (2004)
Mobile subscribers	34,500 (2004)
Internet users	9,000 (2005)
Internet hosts	1,540 (2006)
Television stations	1
Radio stations	FM 2, AM 1 (2001)

Education

Although ICT has been recognised as a critical tool in modernising the education sector to cater for the diverse human resource needs for the country, Djibouti has yet to develop a sector-specific ICT for education policy. In its sectoral strategies for the Poverty Reduction Strategy, the country has committed to establishing a health and education network, improve the connectivity and build ICT training facilities at the university, implement a video-conferencing system, and strengthen the CISCO Academy and the SchoolNet project.[3]

The ministry also has made capacity-building a priority for teachers in the use of ICT through the National Education and ICT project and the automation of the ministry itself. There is also movement from the secondary school level to the national university. At the secondary school

level some schools, through donors and NGOs, have managed to equip computer labs and establish connectivity provided by the telecom incumbent Djibouti Telecom.[10]

Current ICT Initiatives and Projects

It is difficult to establish the exact number of the various projects and state of their implementation due to the scarcity of information. Communication with the respective Djibouti ministries was difficult from both Kenya and Tanzania.

Djibouti Assistance to Education Project (AIDE)
USAID Djibouti Assistance to Education Project, also known by its French name Project AIDE (Assistance Internationale pour le Développement de l'Education), is a three-year effort to improve student learning. The objective will be pursued through three separate but interlocking sets of interventions linked directly to the three intermediate results of increased access to basic education, improved quality of teaching and learning, and increased opportunities for girls' education. The SchoolNet and Cisco Academy initiatives fall under this project.

Through this project USAID donated 40 computers, printers and UPS's to four schools in rural Djibouti. Djibouti Telecom, a partner in the project and the national telecommunications service provider, deployed local area networks and provided Internet connectivity to four schools.

For more information: www.usaid.gov/stories/djibouti/pc_dj_computers.html and www.equip123.net/webarticles/anmviewer.asp?a=70&z=16

AVU/AfDB Teacher Training
Djibouti is one of the beneficiaries of the AVU/African Development Bank (AfDB)/NEPAD, which initiated a teacher education programme that commenced in 2006. The programme revolves around the use of ICTs both in and across the curriculum, with a particular focus on mathematics and science education. The use of ICTs across the teaching curriculum will greatly contribute to improving the quality and increase the number of teachers through flexible delivery using open, distance, and e- learning methodologies at an affordable cost for diploma, undergraduate, and graduate levels.

For more information: www.avu.org/documents/Fact-Sheet.pdf

Education Radio Programmes
In order to increase access and quality of education, the National Education Production Information and Research Centre (in French, Centre de recherche d'information et de production de l'éducation nationale), though its School Radio project develops educational content that is broadcast through Djibouti Radio once a week. These programmes are mainly aired in French and cover secondary school subjects such as mathematics and science. Some of these programmes are also targeted to out-of-school youths.

For more information: www.education.gov.dj/cripen/index.htm, and http://educationsystems-international.dipf.de/bi_set_e.html?Id=4810.

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in Djibouti in terms of enabling or constraining features in the education system.

Table 4: ICT Initiatives and Projects

Factor	Enabling Features	Constraining Features
Policy framework		Djibouti does not have an ICT for education policy. All the ICT work and implementation that currently exists is a result of the national ICT policy which is not sector specific. Most of the initiatives are ad hoc and not guided by detailed policy with a SMART implementation plan.
Infrastructure and access	Djibouti has a relatively good telecommunications infrastructure including landing stations for submarine fibre optic cable and a couple of earth stations.	Access to ICT in Djibouti is complicated by the cost of access, especially for bandwidth. Despite having one of the best telecom networks in the region, the cost of connectivity is very high and out of reach of many, including schools and educational institutions. There is only one telecommunications service provider, Djibouti Telecom, which creates a monopolistic market for fixed lines, mobile, and Internet.
Urban population	Almost 70% of the population is urban, and most of the ICT services and supplies are concentrated in the urban areas.	
Gender equity	The government and its development partners have consciously put in place strategies to increase access for girls and women to quality education. In 2005 USAID provided support to expand opportunities for girls' education by providing incentives to schools for promoting girls' participation and by supporting and expanding existing literacy centres in targeted areas and funding ICT programmes focused on girls' adolescent health and social concerns.[11]	
Resources to invest in ICT		Despite having an urban population and a good telecommunications

		network, Djibouti is one of the poorest countries of the world, which means resources in the education sector are focused on constructing new classrooms, and funding textbooks and teacher-training. ICT has to compete with these very visible and fundable priorities.
Skills and capacity to utilise ICT		ICT skills are low, especially in the education sector where there is scarcity of teachers.
Donor friendly	Djibouti has good relations with most of the development partners from the West, including the EU and the US. With a good ICT for education policy in place, the country can easily win support to implement it.	

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ICT in Education in Egypt

by Amr Hamdy
June 2007

Source: World Fact Book [1]

Disclaimer Statement

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Overview

Egypt faces significant challenges in harnessing its education system to promote its development plans. The government has articulated a vision of an information society in which widespread access to technology can nurture human capital, improve government services, promote Egyptian culture, and support economic growth, and the ICT sector has been targeted as a vehicle for this growth and social development. A national ICT policy has been adopted and is managed by the Ministry of Communication and Information Technology, of which education is one priority. The Egyptian Education Initiative, launched by the First Lady, is a prominent result.

Country Profile

Egypt, sometimes referred to as the "Motherland of the World" and the "Land of Civilisations," is famous throughout the world for its ancient civilization and 7,000 year history along the Nile River. It is an important political and cultural centre of the Middle East. [2,3]

Table 1 provides some selected socio-economic indicators for Egypt.

Table 1: Socio-economic Indicators: Egypt

Indicator	
Ethnic groups	Egyptian 98%; Berber, Nubian, Bedouin, and Beja 1%; Greek, Armenian, other European (primarily Italian and French) 1%
Religions	Muslim (mostly Sunni) 90%; Coptic 9%; other Christian 1%
Languages	Arabic (official). English and French widely understood by educated classes.
Population	78.9 million (July 2006 est.)
Population growth rate	1.75% (2006 est.)
Literacy	Total population: 57.7% Male: 68.3% Female: 46.9% (2003 est.)
GDP per capita (US dollars)	$4,200 (2006 est.)
Labour force	21.8 million (2006 est.)
Unemployment rate	10.3% (2006 est.)
Telephones (main lines in use)	10.396 million (2005)
Telephones (mobile cellular)	14.045 million (2005)
Radio broadcast stations	AM 42 (plus 15 repeaters); FM 14; shortwave 3 (1999)
Television broadcast stations	98 (1995)
Internet users	5 million (2005)

The Education System

The education system (pre-university) in Egypt is state-sponsored and set up in three stages: primary school (six years), preparatory school (three years), and secondary school (three years). Basic education consists of the first two stages and is obligatory for all students in the country.

The higher education sector in Egypt comprises universities and institutions of technical and professional training. The system is made up of 16 public universities, 51 public non-university institutions, 11 private (for profit) universities, and 89 private higher institutions. Of the 51 non-university institutions, 47 are two-year middle technical institutes (MTIs), and four are four- or five-year higher technical institutes.

The Ministry of Education has jurisdiction for all levels of education through secondary school. Each of the 27 governorates has its own governance system. The state Ministry of Education is responsible for the planning, policy formulation, quality control, co-ordination, and follow-up for all levels of public education, including the universities. The state government is responsible for most of education finance for both educational systems. Egypt also receives aid from the World Bank, UNICEF, UNESCO, and several countries.

Curriculum guidelines for each subject, such as arts, literature, mathematics, sciences, and Arabic, are determined through a system of committees at the state level. Each subject-specific committee comprises consultants, supervisors, experts, professors of education, and experienced teachers. Once the committee has reached agreement, the curriculum guidelines are then referred to the Supreme Council of Pre-university Education for official release. Each governorate is responsible for implementing the guidelines.

Table 2 shows Ministry of Education data reflecting the increase in the number of students at different stages and kinds of education from 2000/2001 to 2005/2006.

Table 2: Student Enrolment in Egypt

Education Level	**2000/2001**			**2005/2006**		
	Boys	**Girls**	**Total**	**Boys**	**Girls**	**Total**
Pre-primary	201,114 (52.4%)	182,502 (47.6%)	383,616	281,071 (52.6%)	253,260 (47.4%)	534,331
Primary	3.8 million (52.8%)	3.4 million (947.2%)	7.2 million	4.6 million (51.9%)	4.2 million (48.1%)	8.8 million
Preparatory	2.3 million (53%)	2.1 million (47%)	4.4 million	1.5 million (51.9%)	1.3 million (48.1%)	2.8 million
Secondary	538,841 (49.5%)	548,662 (50.5%)	1.1 million	596,380 (48.1%)	642,809 (51.9%)	1.2 million

Industrial	58,610 (65.5%)	308,867 (34.5%)	894,967	617,620 (62.3%)	374,437 (37.7%)	1 million
Agricultural	159,937 (78.6%)	434,96 (21.4%)	203,433	172,161 (77.1%)	51,225 (22.9%)	22,386
Commercial	358,803 (37.6%)	594,257 (62.4%)	953,060	252,343 (33.8%)	493,376 (66.2%)	745,719
Special Education	19,921 (64.7%)	10,849 (35.3%)	30,770	23,294 (63.3%)	13,514 (36.7%)	36,808
One-class School	1,804 (3.2%)	54,022 (96.8%)	55,826	2,955 (4.3%)	65,672 (95.7%)	68,627
Friendly for girls	-	-	-	1,022 (12.8%)	6,953 (87.2%)	7,975
Total	8.9 million (52.3%)	8.2 million (47.7%)	17.1 million	8.9 million (51.4%)	8. 5 million (48.6%)	1544508

Students take various exams throughout their formal schooling that determine the path that they will take. A primary school exam is administered at the end of the sixth year to test basic knowledge. The preparatory school exam at the end of the ninth year determines which school a student moves on to. Students with high scores continue on to a general secondary school, which qualifies them to attend university later. Those with low scores are directed to technical secondary schools, where students study commercial, industrial, or agricultural education and pursue careers as technicians, salespeople, secretaries, etc.

ICT Policies

Since its formation in 1999, the Ministry of Communications and Information Technology (MCIT) has been responsible for the development of ICT in the country. The MCIT has two strategic objectives: to spread ICT tools nationwide and to set the foundation of an export-oriented ICT industry. Many of the policies and initiatives targeting the attainment of these objectives are publicised to the general public, The MCIT has engaged in partnerships with the private sector, UN agencies, and civil society organisations to maximise the outcomes.

National Policy

The National ICT policy in the area of education is jointly co-ordinated by MCIT and the Ministry of Education. The plans up to 2015 are as follows:[4]

Integrating technology at schools

- Providing a computer, data show, and wide screen connected to the Internet for each class
- Providing computer labs in schools at the rate of one lab for every 15 classes

Introducing developed educational software

- Developing the production of software on scientific bases and linking it to curricula. This can be achieved through the comprehensive development of curricula that the ministry has started recently

Providing electronic educational services

- Uploading the entire primary, preparatory, and public secondary schools curricula on the Internet so that the students can use them at school and at home, take exams that determine their level, and move from one class to another after passing the exams provided
- Extending virtual classes for effective transmission to include a class at least in each educational directorate

Establishing the infrastructure of the information technology

- Increasing the capacity of the international Internet of the ministry to allow the biggest possible number of people to log onto the ministry site, and to make use of the provided services especially the electronic education
- Expanding the tools of linking the Internet to the "E1 circles" (Internet connectivity) that are specialised for exchanging information among schools, administrations, educational directorates, and the ministry to avoid overcrowding
- Expanding the use of ADSL (broadband) and leased lines in addition to what is available now in (dial-up) circles to help schools log onto the Internet

Distance-training national net

- Upgrading the equipment of the distance-training national net (video conference)
- Using video streaming to include rooms in schools
- Using distance interactive learning for testing the standards of those attending the training sessions in the video-conference halls, and for an active participation with the lecturer

Training the educational cadres

- Aiming for most teachers to earn the international computer driver's licence (ICDL) within eight years through a wide international programme, provided that it is mandatory for those who join the work in the Ministry of Education to have this certificate
- Training teachers to use ICTs in preparing and conducting lessons
- Training teachers to use discussions and assign groups of students to prepare co-research instead of just using lecture format

Co-projects with donors

- Extending the use of loans and grants from donors, whether local or foreign, to enhance the educational process
- Setting contracting protocols and agreements with international companies such as Microsoft, Cisco, Intel, and Oracle to help enhance the educational process through upgrading the programmes and training teachers to use modern technology

- Co-operating with the World Bank, European Union, US Aid, and African Aid (among others) to provide schools with the sets and the technological equipment, that will improve the educational process

MCIT Policies and Activities[5]

MCIT supports participation of local and foreign capital through various public-private partnerships (PPPs). These include incubating technology transfer and offering training programmes to young people graduates in co-operation with pioneering international companies, ensuring transparency in restructuring the ICT sector, co-operating with stakeholders in using ICT to improve service delivery to citizens, and showing commitment to the Universal Service Policy.

Further, in June 2000, MCIT, in co-ordination with the private sector, formulated the Telecom Master Plan. This plan suggests strategic economic, business, services, and technical directions and a framework for Egypt's telecommunications infrastructure. The plan calls for the following:

- Emphasising the need to raise teledensity and teleaccessibility in Egypt through restructuring tariffs of both multi-line business and residential services to more cost-based figures and using a universal service fund to subsidise annual charges and installation fees for eligible customers
- Establishing a reliable, scalable, and readily available multi-service, high-speed telecommunications backbone through the transition from circuit switching technology into a more efficient packet switching technology
- Liberalising access services through unbundling and sharing of facilities and wireless services
- Adopting standards to facilitate interconnection.
- Introducing telecom services with new features and capabilities to the Egyptian market, with the appropriate quality of service

The Egyptian government has identified several ways to strengthen the local ICT industry and business sector in Egypt. These include attracting foreign direct investment, stimulating growth of the domestic ICT industry, and promoting exports of ICT products.

Egypt is one of the world's most promising emerging markets, and the country has long been poised to become the information technology hub of the region. The government has made the establishment of a strong national ICT industry one of its top priorities and believes that it will contribute to the acceleration of economic development, promote exports, and increase employment opportunities. With its huge pool of trained ICT personnel and an expanding market, Egypt is increasingly attractive to foreign investment and must take advantage of opportunities to further develop the industry. The ICT Export Initiative aims to:

- Increase local demand in ICT applications and tools

- Promote exports and support marketing initiatives
- Attract investment in the Egyptian market
- Maximise the local value-added component
- Embrace new inventions

To achieve these objectives, the following guiding policies and strategies have been put in place:

- Promote foreign direct investment to Egypt as the regional hub for the Middle East region and the gateway for Africa
- Encourage the private sector to drive the development of the ICT industry in Egypt
- Create an enabling environment for private sector initiatives where the government invests in human capital as a critical input for the ICT industry development

Out of the total number of schools in Egypt (39,926), currently 69.7%, or 27, 838 have computer labs with Internet connection (either dial-up or ADSL). Table 3 shows the breakdown of these figures by level of school.[6]

Table 3: ICT Penetration in Education

Education Level	Number of Schools with Computer Labs
Pre-school	6,956
Primary	8,707
Preparatory	4,327
Secondary	7,848

As a comparison, Table 4 shows the change in ICT penetration (Internet users) in the general population from 2000 to 2006.

Table 4: ICT Penetration in the Population

Year	Users	Population	Penetration
2000	450,000	66.3 million	0.7 %
2006	5 million	71.2 million	7.0 %

Current ICT Initiatives and Projects: Ministry of Education

Multimedia Laboratories
Computer labs have been established in all public and experimental schools for the projection of multimedia programmes using computers as a teaching aid. TV and video sets, enlargement projectors, and interactive CD-Roms and drivers have been provided for the kindergarten and primary stages.

Knowledge Sources Network
Twenty-seven "distance training halls" and 127 schools are using the Internet through direct contact. Over 4,000 schools use the services of electronic mail through the network of the Ministry of Education. A central "electronic library" has been set up with of CD-ROMs, videotapes, and books with teaching aids. All schools participating in the project can benefit from the remote access to the central library. The Internet services are being expanded to reach 4 Mbps to enable a large number of sites and schools to exchange files and share screens by sound, text, and pictures.

Educational Satellite Transmission
Advanced schools have been equipped for receiving thematic educational satellite channels with the possibility of extension to remote rural schools.

Developing Educational Administrative Departments
Twenty-seven administrative departments have been provided with Centres of Training on Technological Development, equipped with multimedia laboratory equipment and receivers of educational satellite channels and training equipment on networks. Over 500 computers have been provided to the educational administrative departments for administrative automation and more than 400 for the analysis of educational statistics.

The iEARN Project
The International Education and Resource Network (iEARN) is a non-profit organisation with over 15,000 member schools in over 100 countries. Children and young adults are collaborating on school assignments using the Internet and other communication technologies.

GLOBE
Global Learning and Observations (GLOBE) is an international project that aims to promote recognition of relevant environmental issues inside and out of schools. It aims to raise awareness of the environmental changes in the world today, provide knowledge, and give students a new vision. Students are encouraged to work in teams within the project.

Seed
This project is a part of the Intel initiative for creativity in learning, which aims for co-operation in education all over the world in the fields of engineering, mathematics, science, and technology learning. The programme began in Egypt in 2004.

Project partner: Schlumberger (a private sector international petroleum company)

NEPAD e-Schools Project
This project focuses on providing end-to-end ICT solutions that will connect schools across Africa to the NEPAD e-Schools Network and the Internet. Solutions include the provision of content and learning material and the establishment of health points at

schools. Egypt is the sixth country in Africa to launch the project after Uganda, Ghana, Lesotho, Kenya, and Rwanda, and the first in north Africa.

Project partner: HP and Oracle

Mtandao Afrika (MAF)
MAF is a collaborative programme for youth to form teams and develop educational Web sites. It is implemented in collaboration with SchoolNet Africa and AGENT Consulting. Within the framework of the project, basic ICT training for over 400 participants from 10 governorates was conducted in 2006 under the auspices of the Ministry of Education.

Project partners: Microsoft Unlimited Potential Program, Ministry of Communication and Information Technology, Xceed Call Center

Josoor Arabia
The Minster of Education in Egypt has launched a new educational initiative addressing the Arab region. The programme aims at promoting Arabic-language content on the Internet. The programme is implemented in collaboration with SchoolNet Africa and AGENT Consulting.

Global Teenager Project
This is a collaborative learning programme addressing secondary school students and operating in a number of schools in Egypt under the auspices of the Ministry of Education. It is implemented by SchoolNet Africa and AGENT Consulting.

Virtual Egyptian Chinese School Project
Both countries agreed on starting a project to teach Arabic to a selected group of students in China, and Chinese to students in Egypt through distant learning

Information System and Decision-making Support
A database has been designed to cover all schools using Oracle software. Educational projections are being made on alternative assumptions. Linkages among different departments have been established for better co-ordination. Personnel are also being trained in the areas of: creation of databases, documentation by scanning, geographical information systems, and the creation of “expert banks.”

The Electronic Educational Project
The project aims to establish a new educational environment that provides distinguished education. The project started with three subjects: mathematics, English, and science. The project has a focus on activating self-learning principle and co-assessment, in addition to facilitating the publication of distinguished educational works whether they belong to students, teachers, or schools..

Information Technology in Schools

From January 2002 through June 2006, information technology in schools brought computers, software, and computer training to 14 schools, affecting 39,000 students in Egypt. The programme also trained teachers to incorporate information technology into their lesson plans and created an online network that allows teachers to exchange lesson plan ideas and to access information on general ICT use.

Project partner: USAID

Training for Development
Training has two components related to ICT. The first is a video-conference distance learning centre that has been established to link 27 sites in all governorates and Luxor City in order to provide learning facilities in remote areas. This has reduced the cost and increased the number of female teachers. Over 370,000 individuals have been trained through 274 training courses and 47 special programmes on practice and assessment. The second component is a training centre on networks and multimedia which has been established in Al Haram to provide training for all the personnel in the field of education on using networks each in their own field of specialisation. In addition, all teachers are encouraged to take the ICDL certificate by making it a prerequisite for future promotions.

Production of Educational Aids
One hundred and thirty-eight multimedia programmes have been produced for different stages of education, 75 films using computer graphics system have been made, and five multimedia programmes have been produced for students with special needs, including a visual dictionary for the deaf.

The Centre for Technological Development and Support of Decision Making
The Centre is provided with the necessary equipment in the fields of information systems, multimedia and videotape productions for transmission through the educational thematic channel. The Centre also produces computer programmes, graphics, and animation; runs a virtual library; and develops modern management techniques for itself and the ministry.

Current ICT Initiatives and Projects: Higher Ministry of Education[7]

Information and Communications Technology Project (ICTP)
The ICTP has established a digital library that now provides all public universities with on-line academic and research content and full access to over 22,000 international journals in almost all subjects to faculty and students. The design of ICT courses (e-learning) has also been completed and was applied during the academic year 2006/07. E-learning activities are also progressing well with the design of 30 e-learning courses completed before end of 2006. One e-learning course was already applied during the academic year 2005/2006 for post-graduates of the various faculties of education of which 29 students have graduated.

Faculties of Education Project (FOEP)

The FOEP sub-project has progressed well over the past 18 months and 54 competitive projects will soon be completed. Improving the infrastructure of the faculties of education is underway through the provision of labs, equipment, and Internet connectivity. Training programmes are being implemented in all faculties of education, and four faculties have agreed to pilot reforms and have already developed new curricula that began to be implemented in 2005/2006 academic year. An additional 14 faculties of education took joined the reform efforts for the academic year 2006/2007, bringing the total to 18, representing 70% of the 26 faculties of education in Egypt.

Project partner: World Bank

Current ICT Initiatives and Projects: Ministry of Communication and Information Technology[8]

Technology Mobile Teams

Mobile laboratories have been provided to 25 out of 27 governorates (administrative departments) to transfer development to faraway villages and hamlets. The teams deal with teachers, students, parents, specialists, and administrators. They also participate in literacy programmes.

Project partner: Egypt ICT trust Fund, which was established in January 2002 jointly by MCIT and UNDP. The fund sponsors programmes and initiatives driven by public private partnerships. The main objective is empowering local communities and providing them with access to the tools and skills needed for the information age. For more information: www.ictfund.org.eg

Mobile ICT Unit

This project involves the use of buses specially equipped with functional media labs to service remote and poorly serviced areas. The units usually stop at schools and communities for up to two weeks.

Project partner: Egypt ICT Trust Fund

ICT for Illiteracy Eradication

The illiteracy eradication software designed by the ICT4IE (ICT for Illiteracy Eradication) is a simple, self-based, interactive computer tutorial that requires minimal input from the student to promote basic literacy. The pilot schemes were selected based on local illiteracy rates, availability of ICT clubs, and supervisory representation in both rural and urban areas. The first CD was tested and evaluated in 2004, with pilots being organised by GALAE and the National Council of Women in Qalubiya and Fayoum. These were evaluated internally and by the Social Research Center (SRC) of the American University in Cairo (AUC), and based on a comparison with six traditional illiteracy eradication classes in the same governorates it was apparent that retention rates were higher and learning was quicker by use of the CD-based media. The second CD was tested in 2005, and since then a contract has been issued to commence large-scale production of the double CD. The CDs are available to all who need them at no charge.

Project partner: Egypt ICT trust Fund

The e-Learning Competence Centre (eLCC)
This initiative was set up to create a national e-learning programme, establishing an organisation to lead and co-ordinate all e-learning projects in Egypt.

Project partners: Oracle, Microsoft, Cisco, Middlesex University, and Learning Institute

ICT for Community Development
This project aims to increase computer literacy and skills among school children across Egypt, improve citizens' access to services and information, and reduce illiteracy.

Project partners: USAID, Egypt Post, MCIT

Stimulating ICT innovation
Two strategic decisions have been taken to stimulate the local ICT industry to innovate and stop the "brain drain" of Egypt's young ICT professionals. One is the Virtual Research and Development Centers of Excellence (CoE) and the other is the Technology Development Fund. The purpose of the CoE is to provide Egyptian researchers with the collaborative environment and support to make breakthrough innovations in the application of ICTs in traditional and new industries. The Technology Development Fund is a public-private partnership established to invest venture capital in Egyptian start-up companies.

Smart Schools Network
The Smart Schools Network is the first integrated move towards a comprehensive modernisation plan for the Egyptian Schooling system. There are 38 schools in the first phase and 50 in the second phase.

Project partner: Egypt ICT trust Fund

IT clubs
This initiative is working to provide IT access to Egyptian citizens and communities and to leverage IT to improve standards of living and the socio-economic conditions. There are currently over 1200 clubs nationwide.

Project partner: Microsoft Unlimited Potential

Free Internet and broadband
The government's first major success in its effort to make technology more affordable came with the launching of the Free Internet Initiative in Cairo. The Free Internet project is a joint effort between MCIT and Telecom Egypt, in co-operation with the majority of Egypt's private Internet service providers (ISPs). The initiative offers subscription-free Internet services to users via dial-up to special-prefix numbers

PCs for Community
The PC for Community scheme evolved from the PC for Every Home project to increase PC usage and to attain the level of penetration to reach one PC per every three families. The programme is also supported by banks offering credit payment facility.

Project partners: Information Technology Industry Development Agency, Ministry of Education, Misr Bank, National Bank, and Egypt Telecom

The Egyptian Education Initiative (EEI)
EEI is a public-private partnership that aims to improve education in Egypt through effective use of ICTs. With the support of the World Economic Forum, multinationals, and donors, the Ministries of Communications and Information Technology, Education, and Higher Education have put in place several initiatives to provide ICT to all Egyptians at an affordable cost. The initiative supports Egypt's overall education reform efforts and maximises the potential for collaborative public-private partnerships to achieve its goals.

Project partners: MCIT, Ministries of Education and Higher Education, and World Economic Forum's IT member's community.

Current ICT Initiatives and Projects: Public Agencies

Educational Satellite Channels
The Centre of Technological Development and Decision-Making Support has produced 68 multimedia films. 9,478 schools, 27 educational directorates, 239 educational administrative units, and 25 mobile technological teams have been equipped with receivers of the transmission of educational satellite channels for use in schools of remote areas. In addition, in an attempt to make use of all potentials of the Egyptian Satellite (Nile Sat), the thematic educational programmes have occupied 7 satellite channels. Transmission for schools started in November 1998. This will cover primary education, preparatory education, secondary education, technical education, languages and general knowledge. A special channel will cover the upgrading of teachers and another for literacy programmes.

Egypt plans to expand the network of distance learning to cover its 260 educational directorates. 45 were covered in 1999. The country also plans to connect the local centers with European and American institutions to train its teachers.

The Children's Library Project
The project was prompted by Bibliotheca Alexandrina with the aim of developing interest in the bookmaking process, including printing and binding, alongside encouraging children to gain a wider literary experience.

Implementing ICT in Education: What Helps and What Hinders?

The Ministry of Education in Egypt is taking a leap in ICT to move to the 21st century. However it is faced by many challenges. Table 5 provides a summary of the current stage of ICT development in Mauritius in terms of enabling or constraining features in the education system.

Table 5: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Infrastructure and access	Egypt's telecommunications infrastructure has increased dramatically during the last few years. A number of initiatives have been undertaken to ensure the creation of a robust and well-spread infrastructure that allows for access to and benefit of ICTs, even in the most remote areas of the country.	Although there are many initiatives and programmes, the current technological infrastructure is still insufficient. As a developing country Egypt has addressed the issues of infrastructure and universal service to reach out across the unconnected parts of the country to allow development in ICT.
Government support and regulations	Egypt is now making firm strides towards fulfilling its obligation to achieving the MDGs by adopting the set plan of action as a framework for change. The Egyptian government affirms that the implementation of the WSIS Plan of Action goals is instrumental in developing the ICT industry in Egypt and providing opportunity for the development of a world class information society.	
Availability of appropriate learning materials	The development of learning/training materials and tools is at the core of the efforts in the area of education. The employment of technology as a vital tool for enhancing the educational process requires revamping of current learning materials. The Egypt Education initiative has as a major target the revamping and restructuring of curricula and learning tools.	Curriculum Education could contribute to the development of Egypt's information society by improving the quality of its human capital. A reform effort has been initiated and technology has been identified as an important component of this effort. ICT is a subject in the school curriculum, but the material is not periodically improved. There are major barriers to change within the education system itself. Most significantly, the country's curriculum and assessment systems emphasise the memorisation of facts, which works against innovative thinking and knowledge creation

		in both schools and universities.
Rural/urban divisions		Fewer numbers of schools and even fewer universities and higher institutions are available in rural communities. There is a lack of infrastructure and facilities in rural areas. There is also a serious problem with the number of school dropouts especially in rural areas.
Gender equity	Gender disparities in the field of education and access to ICT as well as role and placement in the workforce are being seriously addressed. Much improved graduation rates in women are being seen and schemes have been implemented to specifically to provide employment opportunities and education for women in the ICT industry. A number of projects have been implemented to ensure women's participation and inclusion in the development process. Figures and statistics show that the number of female graduates in several domains exceeds the number of males.	In general the level of illiteracy is higher among females, which reflects access to ICT training and skills. There are many more female school dropouts than males due to cultural and economic issues especially in rural areas where females receive education to a certain age then drop out of school.
Human resources	MCIT initiated a number of training programmes to familiarise graduates with the use of computers, which would then help them get better jobs. Egypt has put ICT training at the top of its agenda by including it in its National Plan, and the government has developed training programmes and formed partnerships with training institutes to invest and enhance ICT skills and capabilities. Human resources are one of the major assets in Egypt, and the government sets policy to ensure maximum investment in people to ensure and sustain the development process.	The larger population of teachers lacks proper ICT training; a large number of projects and programmes are concerned with capacity-building and human resource development as a basic need for achieving educational development.
Sustainability	Development projects and the government vision for 2020 has ICT as the founding pillar for achieving the knowledge-based society that is built on the integration of ICT in all	

	domains.	

Notes

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ICT in Education in Equatorial Guinea

by Babacar Fall
June 2007

Source: *World Fact Book*[1]

Please note:

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Overview

In Equatorial Guinea, there is no specific policy concerning ICT, although attempts to improve management in the Ministry of Telecommunications are being made. This could help facilitate the adoption of such a policy in the near future.

The efforts to strengthen the presence of ICT in communities and in schools are primarily made by non-governmental organisations, universities, and other actors. They collaborate on projects that make computer equipment, training, and management available and accessible to students, educators, and members of the community. These initiatives take the form of computer labs in schools or media centres in the community.

Country Profile

The Republic of Equatorial Guinea is a mainland enclave between Cameroon and Gabon and two islands in the Atlantic Ocean. This fragmented country covers a surface area of 28,051 square kilometres with a population of over 540,000, of which 67% live in rural areas. Most of the 90,000 islanders live in Malabo, the capital city. A former Spanish colony, it gained its independence in October 1968, and it remains to date the only country in Africa with Spanish as an official language.

The discovery and exploitation of large oil reserves have contributed to dramatic economic growth in recent years. Forestry, farming, and fishing are also major components of the GDP. Subsistence farming predominates. Although Equatorial Guinea depended on cocoa production for hard currency earnings prior to independence, the neglect of the rural economy under successive regimes has diminished potential for agriculture-led growth. However, the government has stated its intention to reinvest some oil revenue into agriculture.

Table 1 provides some selected socio-economic indicators for the country.[2]

Table 1: Socio-economic Indicators: Equatorial Guinea

Indicator	
Area	28,051 km^2
Natural resources	petroleum, natural gas, timber, gold, bauxite, diamonds, tantalum, sand and gravel, clay
Population	540,109 (July 2006 est.)
Age structure: *0-14 years* *15-64 years* *65 years and over*	 41.7% (male 113,083; female 111,989) 54.5% (male 141,914; female 152,645) 3.8% (male 8,886; female 11,592) (2006 est.)
Population growth rate	2.05% (2006 est.)

The Education System

The education system is organised into cycles and degrees. The levels of education are pre-school, primary, secondary, and higher education. The degrees are the baccalaureate and advanced degrees in higher education. The institutional structure of the school system is as follows:

- The pre-school cycle, for children under six years, is divided into two parts: nursery school and kindergarten. Pre-school education consists of games, creative activities, etc.
- The primary cycle consists of five years of study at two levels. The first level is for children aged six to 10, and the second for children aged 10 to 12.
- The secondary cycle is devoted to preparing for the baccalaureate and to professional training. The baccalaureate is obtained after two cycles of four and three years of study.
- The advanced cycle exists at three levels: the first is three years; the second, devoted to specialised study, is two years; and the third is three years, devoted to research.

Distance education is a means of education that offers opportunities to pursue and continue academic study, in any circumstances.[3]

Tables 2, 3, and 4 summarise some relevant education-related statistics.[4]

Table 2: Literacy Rates in Equatorial Guinea

Literacy rate		1990	2000-2004
Adults (age 15+)	Total	73.3%	87.0%
	Male	85.8%	93.4%
	Female	61.1%	80.5%
Young adults (age 15-24)	Total	92.7%	94.9%
	Male	96.6%	94.8%
	Female	88.8%	94.9%

Table 3: Enrolment in Primary School

Primary		1991	1999	2002
Gross schooling rate	Total	163%	132%	127%
	Male	166%	148%	133%
	Female	159%	116%	121%
Net schooling rate	Total	91%	83%	85%
	Male	92%	93%	92%
	Female	89%	73%	78%

Table 4: Enrolment in Secondary School

Secondary		1999	2002
Gross schooling rate	Total	31%	30%
	Male	45%	38%
	Female	17%	22%

ICT Policies

In Equatorial Guinea, there is no specific ICT policy. However, the government has a Ministry of Technology, Posts, and Telecommunications, and an Office of Telecommunication Regulation (ORTEL) is set up and is preparing two documents on interconnection and numbering. At the sub-regional level there is a harmonising project that is akin to the OHADA (Organisation pour l'Harmonisation en Afrique du Droit des Affaires), an organisation for the harmonisation of business law in Africa. Created in 1993 in Port Louis (Mauritius), the organisation is made up of 16 African countries, and the telecommunications project is well accepted by Equatorial Guinea. As well, basic regional modern principles of regulation of telecommunications have been implemented as defined by the International Telecommunications Union.

While replicating the OHADA model, countries may apply its broad regulation principles in terms of market opportunities, accessibility, and communication safety. The stated objectives are to bring about changes for modernisation and to harmonise a telecommunication regulation framework to give foreign multilateral and bilateral investors a favourable telecom environment.[5]

Infrastructure

According to the International Telecommunications Union, in 2003 there were 9,600 fixed telephone lines in the country, and 1.77 lines per 1,000 people. Table 5 provides a summary of the mobile telephone line service.[6]

Table 5: Mobile telephone lines in Equatorial Guinea

Indicator	
Service provider	GETESA
Number of subscribers to GETESA	55,000
Cellular telephone density	10.95%
Telephones: main lines in use	10,000 (2005)
Telephones: mobile cellular	96,900 (2005)
Internet hosts	19 (2006)
Internet users	5,000 (2005)

ICTs in Education

In Equatorial Guinea, education and distance training is regulated by the Law of Education, section 6, article 46, which states: "Distance education is one of the educational tools that makes it possible to pursue and/or continue educational studies in any circumstance."

Current ICT Initiatives and Projects

Prépaly

A recent initiative was enacted on a platform called Prépaly (interactive multimedia training for PREParing high school students (LYcéens) in advanced scientific and technological studies). Its main objectives are to:

- Respond to the needs of young people in terms of information in science and technology

- Give them basic training in computers and multimedia that will be their key to a successful academic career, and which will help prepare them for the world outside of school
- Reinforce the ties between secondary and higher education establishments in the north with those in the south, as well as to reinforce the ties between schools and academic institutions in different areas of the south
- Facilitate the creation of multimedia content for teaching in francophone Africa

This plan is clearly based on the organisation, production, and diffusion of knowledge and know-how from higher education towards secondary education, through ICT in education.

The French Cooperation
The French Cooperation supports the National University of Equatorial Guinea (UNGE) in their approaches by using ICT to develop centres for teaching and accessing digital teaching resources.

The Malabo Centre, open since 2002, runs a computer lab of seven computer stations, all connected to high-speed Internet. It is located in the UNGE Board of Education. The Bata Centre, open since October 2005, runs a computer lab of five computer stations, which will soon be connected to high-speed Internet. It is located on the campus of the Teacher Training Academy.

Resafad-ICTE
Resafad-ICTE is funded by the Cultural Cooperation and Action Service (SCAC) and has been operating in Equatorial Guinea since July 2002. The initiative has created some multimedia centres that host several servers, a training room equipped with a dozen work stations, and a room to produce educational resources. The centre functions through a network, with branches located in the country linked with centres in other countries. Resafad-ICTE currently possesses two multimedia centres hosted by the National University of Equatorial Guinea. One is in the Board of Education of Malabo and the second is in the Teacher Training Academy in Bata.

Implementing ICT in Education: What Helps and What Hinders?

In Equatorial Guinea, the population has abruptly shifted from the agricultural era to the age of computer and Internet and has not had time to integrate audiovisual technologies. This might explain the deficiency of this technology in other countries' contributions.

The country's geographic configuration (part island and part continental) as well as its demographic configuration (low population) will sooner or later oblige the population to resort to ICT and distance training.

Table 6 provides a summary of the current stage of ICT development in Equatorial Guinea in terms of enabling or constraining features in the education system.

Table 6: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features

Policy framework and implementation	The law commits to distance education being one of the educational tools that makes it possible to pursue and/or continue educational studies in any circumstance.	No ICT in education policy or strategy in place.
Advocacy leadership		No time to integrate audiovisual technologies.
Gender equity		Low school rate of girls in secondary schools.
Infrastructure and access		Access is generally poor and is compounded by the country's geographic configuration (part island and part continental) as well as by its small population.
Learning resources	Distance education is a means of education that offers opportunities to pursue and continue academic study.	

General References

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ICT in Education in Eritrea

by Harry Hare
April 2007

Source: *World Fact Book*[1]

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Overview

Eritrea has made significant efforts to reform its education system with the objective of providing its citizens with accessible and high-quality education that is modern, technologically advanced and that will create an internationally competitive human resource. The rise in the gross enrolment rates, the construction of new classrooms and reconstruction of those destroyed, and the capacity-building initiatives at the Ministry of Education all are indications of a country that is ready to learn.

The government's acknowledgement that ICT has a role to play in improving both access and quality of education is commendable given the bigger challenges of poverty, hunger, disease and access to basic education. The National ICT for Education Policy and the completion of the implementation master plan is bound to generate the necessary momentum within government and other education sector players to seriously start integrating ICTs into education.

Country Profile

Eritrea was awarded to Ethiopia in 1952 as part of a federation. Ethiopia's annexation of Eritrea as a province 10 years later sparked a 30-year struggle for independence that ended in 1991 with Eritrean rebels defeating government forces. Independence was overwhelmingly approved in a 1993 referendum.

Eritrea has a land mass of 124,000 square kilometres and a population of 4.8 million with 44% under the age of 15. It is bordered by Ethiopia and Djibouti in the south, by Sudan in the west and north, and by the Red Sea in the east.[1]

The economy is predominantly agricultural: this sector contributes 9% of the GDP, and it is estimated that 80% of the population depends on it. The country's lowland and escarpment have great potential for agricultural development that, with proper conservation and utilisation of water, can be exploited for intensive and extensive cultivation of variety of staple and cash crops. Eritrea also has high-quality livestock.

Fishing and salt panning are other major activities. The high salt content of the seawater and the hot climate in the region allow for cheaper salt production. Salt is exported to Europe and the Far East.

Table 1 provides some selected socio-economic indicators for the country.[1,2]

Table 1: Socio-economic Indicators: Eritrea

Indicator	
Population	4.8 million (2006)
Languages	Afar, Arabic, Tigre, Kunama,

	Tigrinya, other Cushitic languages
GDP per capita	$1,000 (2005 est.)
Human Development Index (2004)	157 (out of 177 countries)
Human Poverty Index (2004)	70 (out of 102 countries)
Expenditure on education (as a percentage of GDP)	3.8% (2004)

The Education System

In spite of setbacks engendered by years of war and the recent border conflict with Ethiopia, the Government of Eritrea has established and exercises administrative control over schools in all catchment areas throughout its territory. The Ministry of Education has six regional (district) or *zoba* education offices and 55 sub-regional offices. In 2000/01 there were 91 pre-schools, 667 elementary schools, 142 middle schools, 43 secondary schools, three special schools, 10 technical schools, two teacher-training schools, 874 literacy training centres, and two universities.

Eritrea pursues as 2-5-3-4 education system: two years in pre-primary, five years in elementary, three in middle school, and four in secondary. There are nearly 238,000 students in the primary, middle, and secondary levels of education.[3,4]

Education is officially compulsory between seven and 13 years of age. One of the unique features of the system is the commitment by the government through its educational policy to provide basic education in each of Eritrea's mother tongues. Education is therefore delivered in nine different local languages at the primary school level.

Table 2 provides rates of enrolment at various levels of education.

Table 2: Selected Education Statistics[5]

Net primary enrolment	47.8% (2004)
Net secondary enrolment	23.9% (2004)
Gross tertiary enrolment	5.6% (2004)
Gender parity index*	0.7% (2004)

*Gross enrolment ratio in primary and secondary

Education policy

The thrust of Eritrea's National Education Policy, which is based on education as a fundamental human right and lifelong process, is the creation of a modern, technologically advanced, and internationally competitive economy. Education provision in Eritrea is further aimed at human capital formation for self-reliance, self-consciousness, and self-motivation with a view to fighting poverty, disease, and the attendant causes of backwardness.

Eritrea's education policy is based on the principle of universal primary education of up to eight years, as well as skilled manpower requirements of both the public and private sectors,

which are to be met by steadily increasing enrolments at the secondary, technical, and vocational schools.

Completion of elementary education is compulsory for all Eritrean citizens, while completion of middle school (thus acquiring a full basic education) is compulsory for all school-age children. Education in public schools up to the completion of high school is free for all school-age Eritreans who maintain acceptable standards of performance.

The policy framework also advocates the promotion of continuing education through formal and informal channels to achieve higher literacy rates, as well as the selective expansion of tertiary education to meet the envisaged manpower requirements of the economy, while resorting to opportunities offered by the international community to diversify skills acquisition. On all aspects of education, the government aims to eliminate gender disparities and ensure girls' full participation at all levels, as a significant number of households are headed by females and sustainable socio-economic development cannot be realised without women's full participation. The policy also takes into account the need to provide for other socially disadvantaged groups, including physically disabled people, internally displaced persons (IDPs), nomads, those afflicted with HIV/AIDS, elderly people, orphans, those living in rural or remote areas, and anyone who is out-of-school or unemployed. The strategy of mainstreaming people with disabilities into the education system is consistent with an inclusive education policy. The policy further highlights the following priority areas:[6]

- Technical/vocational training through multi-craft dexterity and skills that enhance job adaptability and the retraining potential of students
- Joint participation by the government, communities, and direct beneficiaries
- Official recognition of the professional accreditation of skills and academic attainment through established certification procedures
- Maintenance of the standards of public schools through curricula issued by the Ministry of Education, while private schools follow the same curricula but are not limited by their coverage
- Provision to non-secular schools of accreditation of professional competence (in non-religious matters) only on the basis of established national certification procedures
- Unrestrained private sector participation in the provision of education.

This effort notwithstanding, nearly 60% of children of eligible age do not have access to elementary education (first five years). For middle and high school levels, the proportions are 88% and 86% respectively. Access rates are clearly inadequate to provide Eritrea with the number of educated people required to increase productivity, support private investments, and facilitate growth. In fact, currently more than 70% of the population is illiterate.[7] This is due to a number of factors: the limited physical capacity of existing schools, the distance to schools, the lack of fiscal resources required to bring schools closer to learners, and the overall poverty.

National ICT in Education Policy

The Eritrean Ministry of Education adopted an ICT in Education Policy prepared by an international consultant in 2005 through its Education Sector Development Programme. The

broad policy objectives articulated in the document include a national framework in all ICT-related initiatives in the education sector.

The document also identifies important components of effective ICT integration into education in order to build awareness among stakeholders. It proposes co-ordination and management of ICT in education and a cross-sector strategy for its implementation to maximise effective utilisation of tools and to minimise wastage. The document also recognises the challenges of the "digital divide" by addressing key constraints through the use of ICT to ensure all citizens of Eritrea have equitable access to ICT. The ministry has also finalised the development of an implementation master plan.[8]

The ministry has been conducting ICT capacity-building activities for staff and agencies in line with the policy objectives. Some secondary schools, especially those in urban areas, have started teaching ICT as an examinable subject at the middle level, but ICT has not been integrated as a teaching and leaning tool. About 15 schools have computer labs that with Internet access. These labs were equipped with assistance from World Links (an NGO supplying used computers to schools), from NGOs in the developing countries, and from Fair Allocation of Infotech Resources (FAIR).[9]

There is more use of ICT in the higher levels of education including universities and tertiary colleges, but again most of it dedicated to administrative tasks.

Infrastructure

Liberalisation of the ICT sector in Eritrea in the last 15 years of independence has led to rapid growth of technology deployment in the country. However, the country still has a low penetration level of ICT infrastructure, which is coupled with network congestion and high costs. As a result, ICT access is limited to just a few people and mostly in urban areas where cyber cafés have mushroomed.[10]

Table 3 provides some current statistics for ICT infrastructure in Eritrea.

Table 3: ICT Infrastructure in Eritrea

Telephone lines	37,700 (2005)
Mobile phone subscribers	58,000 (2006)
Internet users	70,000 (2006)
Television stations	2 (2006)
Internet hosts	1088 (2006)
Radio stations	AM 2/shortwave 2 (2000)

In the education sector, some ICT is in currently in use. With the adoption of the ICT in Education Policy, ICT is considered as a strategic tool to improve access to, and the quality of, education.

ICT in schools

There is almost no movement to use ICT within the pre-primary and primary school levels as most of the resources go to providing basic education and constructing classrooms. However, the ESDP framework provides for the establishment of 20 computer labs in 20 secondary schools by 2009. At the secondary school level, ICT is taught and has been made an examinable subject in the higher grades. Courses cover basic computer operations including the use of word processors, spreadsheets, and other utility and productivity applications.

The Ministry of Education also owns and operates a radio station that broadcasts educational content to secondary schools. It is said the Ministry has gone even further and initiated a programme to give free radios to schools that cannot afford them, especially in rural areas. The radio broadcasts are also in local languages and cover subjects such as civics, agriculture, and health.

ICT in universities and tertiary colleges

ICT is used more at the university and tertiary college level, but mostly for research and administrative purposes. There is no clear policy or strategy to use ICT in these institutions despite the government's acknowledgement of the key role that ICT will play in improving its human resource development. The vocational training centres have been particularly earmarked to pass on technical skills, including ICT skills for students dropping out at the different levels of the education system.

Current ICT Initiatives and Projects

Education Sector Development Programme

This is a sector-wide programme based on four pillars that cover access to basic education, improved quality and access to secondary education, and capacity-building for the Ministry of Education. Within the project, 20 computer labs will be established in 20 secondary schools and a total of 400 computers will be distributed. This project is supported by the African Development Fund and the Government of Eritrea.

For more information:
www.afdb.org/pls/portal/docs/PAGE/ADB_ADMIN_PG/DOCUMENTS/OPERATIONSINFORMATION/ADF_BD_WP_2004_130_E.PDF

Computers for Libraries Project

This project was initiated by the British Council and is aimed at equipping all public libraries in Eritrea with computers including CD-Roms and Internet access. The first phase was successful, and a second phase was planned to cover libraries in secondary schools. The partners in this project include Computer Aid International, Library and Information Association of Eritrea, the Ministry of Education, Computer Technology Services, Research and Documentation Centre, and the British Embassy.

For more information: www.britishcouncil.org/eritrea-lis-computers-for-libraries.htm

World Links Computer Labs Project
World Links is a global NGO with a mission to improve educational outcomes, economic opportunities, and global understanding for youth through the use of ICTs and novel approaches to learning. World Links has helped establish computer labs in six secondary schools together with networking equipment in its pilot phase. The project is expected to roll out to more schools. World Links has assistance from the World Bank.

For more information: www.world-links.org/en/news/latest/welcome-to-world-links.html

Fair Allocation of Infotech Resources (FAIR)
FAIR is co-operating with the Eritrean Ministry of Education to distribute and establish ICT labs and training in Eritrean schools. In the first phase, nine schools in the Massawa received complete computer labs. Thereafter schools in the districts of Ghatalai, Ghindae, and Nefasit were added. The project is supported by Norwegian Agency for Development Corporation (NORAD).

For more information: www.fairinternational.org/

Implementing ICT in Education: What Helps and What Hinders?

Table 4 lists the core factors influencing the implementation of ICT in education in Eritrea, and summarises both the enabling and constraining features.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework	With the finalisation of the implementation master plan, the ministry will be able to guide the process of institutionalising ICT in the education sector, which will have the benefit of a structured adoption.	The ICT for Education Policy is part of the Education Sector Development Plan, which seems not to focus on higher education including the universities.
Infrastructure and cost of bandwidth		Despite the liberalisation of the telecommunications sector, the cost of bandwidth is still out of reach of many schools. Access to ICT is also hindered by the penetration level as most of the infrastructure was destroyed during the war.
Electricity		Electricity remains a major problem in Eritrea and inhibits the use of ICTs, especially in rural areas. The national electricity grid is limited to commercially viable areas, missing out most rural areas. The use of ICTs can therefore be mapped with areas that have electricity.

ICT as a priority		A lot of resources are aligned with the sector development programme with its bigger project dealing with fundamental challenges such as construction of classrooms and availability of textbooks, so ICT is not a priority area.
Tutor technicians		Lack of trained teachers with ICT knowledge contributes to the lack of interest or seeming lethargy in adopting ICT in the classroom.
Interested partners	Two of the main distributors of refurbished computers in schools, Computer Aid and World Links, have started working with the Ministry of Education. The pilot by World Links is now due for a wider rollout.	
Literacy and awareness		Use of ICT is almost proportional to the level of literacy and awareness. Illiteracy is still very high and awareness of the benefits is very low.

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ICT in Education in Ethiopia

by Harry Hare
June 2007

Source: *World Fact Book*[1]

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Overview

Leapfrogging is the word most technical people would use to describe the advancement, at least in infrastructure, that has occurred in Ethiopia in less than 10 years. Even though the country may still have one of the lowest tele-densities in the continent, there are signs that this situation will soon change. The WoredaNet, the e-government communication backbone, developed by the Ethiopian Telecommunication Corporation, is a promise and a major enabler for rapid ICT development in the country.

Already the public sector and the education sector have begun to benefit from this network, and the health and agriculture sectors have been lined up for the next phase. With all this and a corresponding ICT for education policy and implementation plan, Ethiopia is set to become a model ICT user on the continent. The infrastructure seems to be falling into place and the policies and strategies are already there. The challenge now is for the government to effectively co-ordinate the implementation of the strategy.

Country Profile

Ethiopia covers a total area of 1.25 million square kilometres with an estimated total population of 75.6 million (2005), growing at an annual rate of 2.7%. In demographic terms, the population of Ethiopia can be termed as young, as about 45% of its population is under 15 years (2004). This trend in population growth has consequences for the education sector; there may be additional strain placed on the system through increasing demand for primary and secondary education. The net primary enrolment for 2004 was 46% while that of secondary for the same period was 25%.[2]

Nearly 84% of the current population is rural and depends for its livelihood predominantly on a traditional agricultural economy that is susceptible to persistent drought and low levels of productivity. The country's largely rain-fed agricultural production accounts for about 46% of the GDP, 85% of the exports, and nearly 90% of the labour force. The industrial sector accounts for 10% of the GDP and 15% of the exports, and employs close to 2% of the labour force.[3]

Table 1 provides some selected socio-economic indicators for the country.

Table 1: Socio-economic Indicators: Ethiopia

Indicator	
Population	75.6 million (2005)
Languages	English, Amharic, Tigrinya, Oromigna, Guaragigna, Somali, Arabic, other local languages,
GDP per capita (US	$114 (2004)

dollars)	
Human Development Index (2004)	170 (out of 178 countries)
Human Poverty Index (2004)	98 (out of 102 countries)
Expenditure on education (as a percentage of GDP)	4.6 %

The Education System

Table 2 provides rates of enrolment at various levels of education

Table 2: Selected Education Statistics[4]

Net primary enrolment (%)	22% (1991); 46% (2004)
Net secondary enrolment (%)	25% (2004)
Gross tertiary enrolment	19% (2004)

Education policy

The importance the Government of Ethiopia has placed on education for national development is evident from the urgency with which the transitional government adopted the Education and Training Policy in 1994.[5] This document outlined the mission and goals for the education system of Ethiopia to achieve the present and future national economic and social development goals. It has been the foundation of all the sector policies that have followed, including the Education Sector Development Programme I and II and the ICT in Education Implementation Strategy and Action Plan.

The ICT in Education Implementation Strategy and its corresponding Action Plan are components of a wider Ethiopian national e-education initiative. This initiative forms one of the pillars of the ICT for Development 2010 Plan.[6]

The strategy is built on three main streams:

- Ethiopian National SchoolNet Initiative
- The National ICTs in Higher Education Initiative
- The National ICT Education, Training and Awareness Initiative

These three streams form the basis for the implementation of the strategy across the education sector. The National SchoolNet initiative, for instance, is aimed at the deployment and the exploitation of ICTs to facilitate the teaching and learning process within primary, secondary, technical and vocational schools. The ICTs in Higher Education Initiative focuses on deploying ICTs within the universities, colleges, and

research institutions. And, finally, the National ICT Education, Training and Awareness initiative promotes ICT awareness and literacy, lifelong and adult education, and distance and virtual education and learning. The strategy also identifies strategic goals and draws up a programme and activities for each initiative.

Both the national ICT4D 2010 Plan and the ICT in Education Implementation Strategy recognise ICT as an enabler for widening access to education for the Ethiopian population, for supporting literacy education, and for facilitating educational delivery and training at all levels.

Infrastructure

Ethiopia's national ICT policy has set the stage for growth within the ICT sector despite the country having one of the lowest penetration rates in the region. Tele-density in 2005 was 0.83 per 100 inhabitants, exclusive of mobile telephony. If the 410,630 mobile subscribers are included, the penetration rate shoots up to 1.39 per 100 inhabitants in the same period. In 2004 the country recorded 225,000 personal computers to be in use, but mainly in the capital city Addis Ababa.[7]

The number of Internet users rose from 75,000 in 2003 to 113,000 in 2004 with 88 Internet hosts. The usage numbers were again skewed for the urban community, which forms only 15% of the total population. This trend is indicative of the country's infrastructure development with most of the communication infrastructure concentrated around the capital city.

Ethiopia Telecommunication Corporation (ETC) was licensed by the regulator, Ethiopia Telecommunications Agency (ETA) as the national operator to provide public switched telecommunication services, GSM 900Mhz mobile telecommunication service, Internet service, and digital data communication.[8]

Table 3 gives a statistical overview of the infrastructure available.

Table 3: ICT Infrastructure in Ethiopia

Telephone lines	610,300 (2005)
Mobile telephones	410,630 (2005)
Internet users	113,000 2005)
Internet hosts	88 (2006)
Television broadcast stations	1 plus 24 repeaters (2002)
Radio stations	AM 8, FM 0, shortwave 1

ICT in schools

With the existing infrastructure, there are obvious challenges to the proposed strategy. For instance, the strategy envisages the integration of ICT into the learning, teaching, and administration of the school system through education information management systems. But with only 40% of schools in Ethiopia having computers, this may be a daunting task. And of the schools that do have computers, most of them are in Addis Ababa, thereby creating a major rural-urban divide should the strategy be implemented within the current context.

A related challenge is that most schools have limited or low access to the Internet. Those schools that are connected generally use e-mail only, and it is available only to the administration. Access to ICTs by teachers is also limited, especially to computers and the Internet, which makes it difficult to assume that educators can integrate ICT into their teaching.

These challenges notwithstanding, the Ministry of Education, through the ICT in Education Implementation Strategy, has drawn up an action plan that consists of 15 programmes and initiatives. These programmes include the formation of a National Task Force for ICT in Education and a Secretariat under the Ministry of Education that will co-ordinate the activities.

To address the connectivity challenges, the Ethiopian Telecommunication Corporation, with assistance from the government, the World Bank, the African Development Bank, and the International Monetary Fund has established a state-of-the-art multimedia broadband backbone infrastructure with a core nucleus of 4,000 kilometres of optical fibre.[9] (See **WoredaNet Initiative** below.)

It is this same network that has provided a backbone for the first phase of the SchoolNet initiative. Classrooms in schools are equipped with plasma screens and receive lessons via video broadcast for eight hours a day by satellite TV with content from the Educational Media Agency.[10] Local area networks have also been established in 181 schools, which have also received computers from the project.

ICT in universities

In a baseline survey conducted by the Ministry of Education, it emerged that most universities and institutions of higher leaning in Ethiopia have computers. However, these computers are few and, therefore, shared at a student-computer ratio of 10:1 in most cases. The study also showed that despite the presence of computers, most of the institutions lack a network infrastructure and have limited connectivity. The lecturers are yet to adopt ICT as a teaching tool, and only a small number of students use computers and the Internet as a learning resource.

One of the key roles that ICT has played in the higher education sector is that of distance learning through the Internet. In Ethiopia, however, most of the nation's universities have indicated they are not involved in electronic distance education (EDE) initiatives; in fact, only 15% of private universities have indicated that they use EDE.

However, there has been some movement from some universities. The University of Addis Ababa, for instance, has an ICT development office charged with the sole responsibility of implementing ICT initiatives.[11] These include developing systems and infrastructure for use by students, lecturers, and the administration. The university is also collaborating with the Indira Gandhi National Open University on electronic distance education.

At the school level, the co-ordination seems to be centralised at the Ministry of Education through the Regional Education Bureau. However, at the university and college level, it appears most activities are carried out and co-ordinated by the universities themselves. Other players in government include the Ministry of Finance and Economic Planning, the Ministry of Capacity Building, the Ministry of Defense, and the Ethiopia ICT for Development Agency.

Current ICT Initiatives and Projects

WoredaNet Initiative
This is a major e-government initiative that connects all 600 of Ethiopia's local councils (*woredas*) to 11 regional capitals through Internet telephone and video-conferencing. .) Half the links are by cable, and half by satellite The initiative also provides connectivity to the SchoolNet, eHealth, and the soon-to-be launched AgriNet. WoredaNet is implemented by the Ethiopia Telecommunication Agency with funding from the World Bank and the African Development Bank through the Ministry of Capacity Building.

For more information:
www.cisco.com/application/pdf/en/us/guest/netsol/ns579/c647/cdccont_0900aecd8030981d.pdf

SchoolNet Ethiopia
The joint initiative by the Ministry of Education and UNDP is probably the most visible project in the country with a total of 181 schools equipped with a minimum of 15 networked computers per lab all connected to the Internet. An additional 15 schools were to be equipped with computers and a printer by the end of February 2007. There are new programmes around this initiative in the planning stages, including creating an extranet that will connect the schools.

For more information: www.schoolnet.et

Distance Learning
The Ministry of Education has initiated a distance learning initiative using video-conferencing with the Indira Gandhi National Open University in India. The project has started accepting students, mostly teachers, and offering master's degrees in economics, marketing, and business administration. The project is in collaboration with the University of Addis Ababa, Alemaya University, and St Mary's College.

ICT Development Office of AAU
The ICT Development Office at Addis Ababa University was established as a liaison office for collaborating with overseas universities, development partners, and relevant local institutions to initiate and implement ICT-related projects and activities. The broad duties and responsibilities of the office are developing an ICT strategic plan and overseeing its implementation. This initiative is supported by Ethiopiaid and Sida.

For more information: www.aau.edu.et/ict/index.php

Ethiopic Standards Development and Dissemination Program Development
This Government of Ethiopia and UNESCO-supported initiative enables unrestricted and easy communication using modern computers and software for Ethiopic script users. The project has developed a standard keyboard layout and has provided standard terminology of computer words in Amharic.

For more information: www.eictda.gov.et/Standard.htm

Implementing ICT in Education: What Helps and What Hinders?

Unlike many African countries where educationalists are still grappling with policy issues and trying to formulate strategies for adoption of ICT within their education sector, Ethiopia has done well in developing a detailed strategy and an accompanying implementation plan all with action plans and timelines. This does not mean however, that there are not challenges and constraining factors to the adoption of ICT.

Table 4 lists some of the most visible enablers and inhibitors of ICT use.

Table 4: Factors Influencing ICT Adoption

Factor	Enabling Features	Constraining Features
Policy framework and implementation plans	Ethiopia has a well structured plan that clearly identifies the issues and sets out a strategy to address the various challenges of implementing ICT in the education sector. The strategy also maps the activities in the action plan with key policies and gives time lines on the various deliverables.	
Gender equity	About 50% of school-age girls do not have access to primary schools, and even those who do often drop out or repeat for economic or cultural reasons. However, the Ministry of Education, in partnership with the British Council and the UK's Active Learning Centre, have been working to improve girls' enrolment and to reduce their poor performance.	

Infrastructure and access	Ethiopian Telecommunication Corporation has made tremendous effort in establishing the national backbone. This has contributed to the SchoolNet initiative that has provided Internet connectivity to 181 schools.	Infrastructure development remains the biggest constraint for the use of ICT in the education sector. The cost of equipment and bandwidth are barriers to entry for schools and, therefore, students. This is compounded by the major distribution disparity of infrastructure between the urban and rural areas. Schools in rural areas are most disadvantaged; most of the existing infrastructural resources are concentrated in the urban areas, especially Addis Ababa.
Lack of resources		Most schools and even colleges have not factored in ICT development to their organisation's budget. The public schools are entirely dependent on the federal government plans to equip them with the various ICTs and on donations from well-wishers.
Language barrier		Amharic is a working language in Ethiopia. Unfortunately, a lot of content on the Internet is in English, which creates a barrier to the Amharic-speaking population.
Skills and capacity		ICT skills are still low in Ethiopia, which creates multiple problems of usage and utilisation of ICTs.
Awareness of the benefits of ICT	Some schools and institutions are aware of the benefits of adopting ICTs into their organisations and have taken advantage of and have invested and are utilising ICTs to give their students an edge. These are, however, mostly private schools and are mostly located in Addis Ababa.	Lack of awareness of the benefits of ICT is a major hindrance to its adoption, especially within the education sector. Most rural communities in Ethiopia, which form more than 80% of the population, have not woken up to the issues of the information society.

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Given the constantly changing nature of the Internet, we suggest that you copy the document or web site title (and author or organization name, as appropriate) of a resource below into your favorite search engine if a link on this page is not working.

ICT for Education in Gabon

by Babacar Fall
June 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

The findings, interpretations and conclusions expressed herein are entirely those of the author(s) and do not necessarily reflect the view of *info*Dev, the Donors of *info*Dev, the World Bank and its affiliated organizations, the Board of Executive Directors of the World Bank or the governments they represent. The World Bank cannot guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply on the part of the World Bank any judgment of the legal status of any territory or the endorsement or acceptance of such boundaries.

It is expected that individual *Country Reports* from the *Survey of ICT and Education in Africa* will be updated in an iterative process over time based on additional research and feedback received through the *info*Dev web site. For more information, and to suggest modifications to individual *Country Reports*, please see www.infodev.org/ict4edu-Africa.

Overview

Gabon has opted to set up a national system for general access to information using computer-related technologies. However, there is currently no plan in the education system to incorporate ICT into the administrative and teaching domains. Of course, the need to computerise schools is becoming urgent, but the initiatives required to address this need are considerable. A plan for managing computers, from the National Ministry of Education, has been in development since 2006.

Country Profile

Gabon is a Central African country on the equator, bordered by Cameroon and Equatorial Guinea to the north, by Congo to the east and south, and by 750 kilometres of coastline to the west. The climate is equatorial, which is hot and humid, with alternating dry and rainy seasons throughout the year. The country is home to forests where flora and fauna are still well conserved.[2] The Ogoué River crosses through it from the west to the east for 1,200 kilometres.

Gabon's area covers 267,667 square kilometres. The population is about 1.5 million (2003) at a density of 4.8 people per square kilometre, and a foreign population estimated to be about 15.2%. The population lives mostly in the urban zones: 73% according to the national census (Recensement Général de la Population et de l' Habitat – RGPH) and 80% according to the 2000 Demographic and Health Survey (Enquête démographique et de santé – EDS). About 80% of women and 75% of men between 15 and 49 years old live in the city.

Gabon is rich in natural resources. It has a number of underground mineral deposits such as petroleum, uranium, manganese, niobium, phosphate, and gold. Petroleum is the country's chief export: between 62% and 78% of 2004's budget resources with a production of 13.5 million tons in 2004. Gabon is the third-largest exporter of manganese in the world. Forestry is the main source of employment and makes up 13% of exports.

The industrial sector (19% of the GDP) is primarily based on oil field activities, wood manufacturing, food agriculture, cement, and construction. There is an important development in the service sector (46% of the GDP), especially in distribution, transport, banks, insurance, business services, and telecommunications.

Libreville, the capital, receives the Central African Fund for Stocks and Shares (BVMAC).

Table 1 provides some selected economic indicators for the country.[3]

Table 1: Economic Indicators: Gabon

Indicator	
GDP (US dollars)	$9.2 million (2004)
GDP per capita (US dollars)	$5,112.2 (2004)
Growth rate	1.5% (2004)
Inflation	1.1% (2004)
Budget balance (euros)	+439.2 million

	(2004)
Total debt (US dollars)	858 million (2003)

The Education System[4]

The education system is made up of pre-primary and primary education, general and technical or vocational secondary education, and higher education. Outside the traditional system there are the professional training and literacy programmes available for youth and adults.

The literacy rate was 85.4% in 2005, one of the highest in sub-Saharan Africa, and the proportion of the population with some primary education is 92%. However, there are efficiency problems within the schooling system in terms of drop-out rates which lead to students having to repeat grades. This phenomenon of repeaters is partially attributed to large classes, the lack of teachers in the rural regions and in certain urban zones, the poor quality of education, and the low qualifications, of the teachers.

A reform for the primary education system has been initiated by public officials. It discusses stimulating activities for pre-primary education and the Approach for Basic Education (APC), which calls to lower the age at which Gabonese children enter primary school from six to five years.[5]

As part of the national action plan of Education For All (EFA), the Gabonese government is considering widening the education informal sector by increasing the adult literacy level to over 50%, particularly for women, by the year 2015. It also envisions all adults having equitable access to basic and permanent education programmes.

ICT Policies

ICT networking development

There is no one institution responsible for ICT development in Gabon. The president takes overall responsibility in this area, and he is advised by an expert in computer technology. The advisor is a member of the Commission Nationale d'Informatique and he also belongs to the Central African sub-regional co-ordination of RINAF, a UNESCO-supported project.

Networking activities within the country have focused on the Réseaux National Gabonais de Développement Durable (RNDD) (Gabonese National Network on Sustainable Development). RNDD has been established with the support of the United Nations Development Program, particularly the Sustainable Development Networking Program (SDNP). A workshop has established the guidelines for the Gabonese network through a national series of meetings. The leading committee has indicated the following areas as main concerns: higher education and research, education and culture, documentation, public administration, environment, trade and industry, media and NGOs, information and communications, and health and the population.[6]

Gabon employs a national system of information and generalised access supporting the use of technology, including the Internet, to promote development through access to the best information available. This governmental system is integrated into a national context that is already in reform.

A development plan conceived by the Network for Sustainable Development was completed in 2000. A conference was held in 2002 with all the stakeholders to update the plan. Infrastructure development was the main focus.

The General Bureau of Computers (DGI) is responsible for the development of all the computers used in the Gabonese administration. It unites the systems for information development in several departments. Using its position and status, it makes national choices in matters of computers and standardises the context of development and electronic information exchange among the different administrations.

Regulatory framework and sector regulation[7]
As of February 12, 2000, telecommunications services have been regulated and as of June 27, 2001, the telecommunications sector has been regulated. Under the law exclusive rights were given to Gabon Telecom (until 2006) for establishing national and international non-radio networks and for installing telephone service operating between fixed locations. In 2007, Morocco Telecom bought the Gabonese Telecom and acquired exclusive rights to provide wire telephone systems in the country.

Currently, the telecommunication sector in Gabon is regulated by the ministry, and a monopoly still exists in the provision of basic telecommunication service through the state-owned Office de Postes et Télécommunications (OPT). All telecommunication investments are financed "independently" from the government, since they are all done by OPT.

Infrastructure

Gabon is one of only two countries in the central African region that possesses a connection to the WASC/SAT3 through sea cable, which links Europe to Asia by skirting the African continent. Since international communication using this cable is 10 times cheaper than by satellite, this puts Gabon at an advantage and places the country in a leading position for future telecommunications platforms in the entire sub-region.

Gabon Telecom is pursuing an active densification policy of its network to cover rural areas – mainly by using VSAT links. It is also planning to extend the optical fibre link from Libreville to Port-Gentil in the south of the country.

Recently, the technological progress and the liberalisation of the telecommunication market have stimulated the development of the telecommunication sector as illustrated by the following figures:[8]

- 40,000 fixed telephone lines
- 350,000 mobile telephone subscribers
- 55,000 Internet users (5% of the population);
- 210 cyber cafés
- 25,000 computers in service.

Gabon had more than 45,000 subscribers to fixed telephone lines in 2005, with a fixed-line telephone density of 2.86%, but it's the cellular phone market that is expanding more quickly with 500,000 subscriptions in 2004 covering 36.2% of the population.

For the Internet, three service provides share the market:

- Gabon Telecom (Inet)
- SOLSI (Online Services and Computer Systems)
- INTERNET GABON

The use of free software solutions is also growing rapidly in the central African region.

ICT in Education

Today, in Gabon, it is clear that although the state spurs the development of technology, there is currently no policy to integrate the administrative and the educational domains to ICT apart from the 2001 plan, which envisioned equipping high schools with computers but no other initiative to promote ICTs.

An outline project set forth by the National Ministry of Education was drafted for school computer equipment, in 2006.[9] By targeting the development of ICT skills and the improvement of the efficiency of the educational system, the Ministry of Education of Gabon is putting information technologies at the core of a national strategy for helping all students to leapfrog into the knowledge society. The educational project is part of an "e-government" framework that includes several projects for developing infrastructure for communication and on-line services for businesses and citizens in Gabon.

Structures for ICT training

- The African Institute for Computer Technologies (IAI), based in Libreville, has trained a large portion of the computer executives and technicians of francophone Africa. Former students and professors have been central to the creation of university departments and specialised schools in the sub-region. The existence of this school, created through the efforts of several nations, has allowed for the development of a small regional scientific community of technicians in computing who come together at the biennial organisation of the Conference on Research in Computer Science, or CARI. The creation of the IAI should be considered the first great project of international co-operation in the field of information technology.[10]
- The University of Science and Technology of Masaku (USTM), located in Franceville in the southeast of the country, is about to become the national centre for training engineers and technical personnel. With the support of the American Embassy it has installed a VSAT link with Houston (USA). This allows the university to have access to the latest information on technology and related issues.[11] Such an investment makes it possible for engineers and technicians to get quality training.
- Campus numérique francophone de Libreville (the Francophone digital campus in Libreville), which is connected to the Université Virtuelle Francophone (Virtual French-speaking university) (UVF), provides training in scientific and technical information.
- The Agence Universitaire de la Francophonie (AUF) offers the TRANSFER programme to "support ICT in higher education and research" through Internet site design training. Another AUF programme is Information and Communications Technology and Fostering Knowledge. Its primary activities concern access to scientific and technical information, Internet access, producing multimedia content, providing documents to the institutional members of AUF, face-to-face vocational training, distance training leading to qualifications, and Web hosting for young, innovative businesses.

Current ICT Initiatives and Projects

The President of the Republic of Gabon, El Hadj Omar Bongo Ondimba, and his government have launched a series of initiatives to develop ICT in the country with a view to becoming a major digital pole in western and central Africa. These initiatives include the following.

ARES, HP, and Ministry of Education
ARES and HP[12] are working with the ministry on a large-scale ICT project that will bring Gabon's education system into the 21st century. The project aims to integrate ICT into schools in order to enhance the quality of teaching and learning activities and raise the level of ICT awareness among students. The goal is to bring ICT to all of Gabon's secondary schools in the coming three years. The project is set to:

- Supply schools with computers and wireless LAN
- Provide teachers with a programme to buy a personal laptop (1,000 teachers are already involved with the first step)
- Deploy a portal for administrative and learning activities based on the Learning Gateway framework provided by HP and Microsoft
- Train teachers on how to use computers and integrate ICT into teaching activities
- Set up a management-of-change programme involving all actors working in the educational system

Other partners include Cisco Systems, which will provide the school wireless LAN equipment, and e Charlemagne, which is providing the school administration system.

Friends of the Net Forum
Friends of the Net Forum is a Gabonese NGO whose goal is to make the Internet easier for youth to understand and use, and to help them create their own jobs. This NGO has already launched two projects: Net Rush and Internet and Education. They concern the popularisation of the Internet to make it easier for youth to use. Training is offered to young people so that they can then become trainers to others.[13]

For more information: www.fan.africa-web.org

AUF
The African Virtual University (UVA) and the Francophone University Agency (AUF) have signed a convention of co-operation that enables collaboration between the two organisations. Further, in honour of International Day of the French Language, AUF and the NGO Friends of the Net Forum organised training for women in ICT use in March 2006. Women were invited to come and learn how to create their own Web sites.

Fibre links at universities
The higher education institutions in developing countries, such as the University of Omar Bongo Ondimba in Gabon, benefit from software and computer materials available to them in spite of the limitations of inadequate telecommunication infrastructure and the lack of support.[14] However, an optical fibre link has been installed at all campuses that will greatly enhance access speed.

African radio

Africa n°1 is the most important African French-speaking radio station. Its programmes are broadcast all over the world thanks to its shortwave transmitters. The radio also has FM relay stations in large French-speaking capital cities. Africa n°1 also deals with games *(La Corbeille* and *Challenge)* in which listeners from all over the world take part. There are also information magazines, history, and health programmes.[14]

Radio Emergence is the education radio in Libreville, Gabon. The station is run by and for youth, and symbolises a real means of expression and responsibility. The Minister of Education co-operates with the National Pedagogical Institute and UNESCO to set up an EMP club (Population Education) in each school in Libreville, a project which Radio Emergence helps to promote. Specialists are working to install a digital network of distance learning. Radio Emergence will also use this opportunity to extend its services throughout the country.[15]

Implementing ICT in Education: What Helps and What Hinders?

Table 2 provides a summary of the current stage of ICT development in Gabon in terms of enabling or constraining features in the education system.

Table 2: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation	A development plan conceived by the Network for Sustainable Development was completed in 2000.	There is little commitment from the government.
Advocacy leadership	The National Education Syndicate (SEENA) and the Teachers in National Education Union (FESENA), based in Gabon, put pressure on the National Ministry of Education to implement certain programmes.	
Gender equity		Gender inequity for access to ICT exists.
Infrastructure and access	Gabon Telecom is pursuing an active densification policy for its network in rural areas – mainly by using VSAT links.	There is little access to ICT infrastructure.
Policy and collaborating mechanisms		The Gabonese government is slow-to make decisions.
Human resource capacity	The College of Libreville (ENS) offers training to the different ministries.	ICT expertise is lacking among the staff and teachers in the education system.

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ICT in Education in The Gambia

by Kofi Mangesi
April 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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Overview

The Gambia has seen tremendous developments in ICTs over the past few years. Progress has been made in telecommunications, yet the full impact of ICTs in the education sector is still yet to be realised and a draft policy is yet to be finalised. In those areas where progress has been made, the role of NGOs has been key.

Country Profile

The Republic of The Gambia on the west coast of Africa is located on two banks of the River Gambia. With a population of about 1.5 million, it is the smallest country on the African continent and ranks 155 out of 177 countries on the United Nations Human Development Index.

From 1998 to 2001 The Gambia enjoyed consistent growth, averaging 5.4%, boosted by favourable weather and strengthening of reforms. However, in 2002 real GDP declined by 3% because poor rains reduced agricultural production, with a halving of the groundnut harvest and a reduction of about one-third in the output of other crops. The only sectors in the economy to show strong growth were tourism and construction. Real GDP rebounded to 7% in 2003, and 5% in 2004 and 2005.[2]

Table 1 provides some selected socio-economic indicators for the country.[3,4]

Table 1: Socio-economic Indicators: The Gambia

Indicator	
Population	1.5 million
Languages	English
2005 Economic activity 2005 (percent of GDP)	Agriculture: 33.0% Industry: 13.0% Services: 53.9%
Human Development Index	155 (out of 177 countries)
Human Poverty Index	86 (out of 102 countries)
Per capita gross national income (US dollars)	$320 (2000); $270 (2004); $290 (2005)

The Education System

Since 2002, a new basic education programme has been in place. Lower basic covers Grades 1 to 6 and upper basic covers Grades 7 to 9. Senior secondary education (Grades

10 to12) is for pupils between the ages of 16 and 18. At the end of Grade 12, pupils sit for the West African Secondary School-leaving Certificate Examinations (WASSCE).

Higher education in The Gambia is provided by the University of The Gambia, created in 1999, which comprises four faculties and Gambia College which includes four schools: Agricultural Science, Education, Nursing and Midwifery, and Public Health.[5]

Table 2 provides a quantitative perspective of some selected system indicators.[3]

Table 2: Selected Education Data

Indicator	
Primary enrolment (% gross)*	79.9 (200); 81.4 (2004)
Secondary enrolment (% gross)*	33.6 (2000); 46.9 (2004);
Ratio of girls to boys in primary and secondary (%)**	80.5 (2000); 97.7 (2004)

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**Ratio of girls to boys is the percentage of girls to boys enrolled at primary and secondary levels in public and private schools.

ICT Policies

National

The proposed Gambia National Information and Communication Infrastructure (NICI) Policy and Plans was designed to address the areas where ICT would facilitate the achievement of the Vision 2020 overall objective, which is to transform the nation into a middle-income country by 2020 through accelerating private sector development, restructuring economic management, developing the human capital base, and institutionalising decentralised and democratic participatory government structures, processes, and systems. The overall objective for the policy is to “leapfrog” several stages of development by establishing a participatory approach in building human resources and a conducive environment that utilises ICT as a platform to exchange data, information, and knowledge, and as a tool to implement applications and provide services to achieve higher growth rates in all spheres of socio-economic activities.[6]

The policy addresses 10 priority focus areas or pillars:[7]

- Infrastructure
- Regulatory issues
- Local governance
- Education
- Health
- Trade and commerce

- E-governance
- Agriculture
- Gender
- Media

The Department of State for Communication, Information and Technology is the lead agency responsible for implementing the policy.

Education
A draft ICT Policy framework for State Education has been ongoing since 2002. It is expected to be finalised by the end of March 2007. Core elements of the ICTs in education policy include the following:

- Network all educational institutions and institute a mandatory computer literacy programme in all educational entities in the country coupled with continued training of all educators.
- Strategically position the newly established University of The Gambia by appropriately integrating ICT in all of its curricula.
- Forge alliances with a carefully built up "high-end" ICT training institution to be establishd by the public sector or in partnership with the private sector (or preferably by competent Gambian entrepreneurs with the support of government) and position it as an ICT training hub not only for the Gambia but also to the entire West Africa region. Information technology skills must be a mandatory requirement and carefully integrated in the entire curriculum of the entire educational sector.

The major implementation agency for the proposed policy is the Department of State for Education.

There is a proposed second policy for schools, sponsored by DFID, but it is at a very early stage of development.

Infrastructure

National
The Gambia has been slow in liberalising its telecom sector, which has in many ways affected the penetration levels of the various ICTs indexes. The State Telco Gamtel is the only fixed network operator; however two mobile operators are in operation. There also exist many private ICT initiatives, especially in the capital Banjul, that provide Internet and computing services.

Table 3 provides a snapshot of the state of national ICT infrastructure.

Table 3: ICTs in Gambia

Indicators	
Fixed-line operators	1
GAMTEL	44,000
Total fixed-line telephone subscribers (2005)	44,000
Cellular mobile operators	2
GAMCEL	147,478
AFRICELL	73,841
Total cellular mobile subscribers (2005)	221,319
Internet data service providers	4
Internet users per 100 inhabitants (2004)	4
International voice gateways licences	1
International data gateways licence	1

Source: Pura&ITU[8]

Education

At the tertiary level, a computer lab with a high-speed Internet connection provided by the Government of Taiwan and the Government of Gambia is currently serving the university community with other private-sector initiatives. At the Gambia Technical Training Institute (GTTI) there are two networked labs connected to the Internet.

At the secondary level, a project by the Ministry of Education to provide a computer lab for all state schools in The Gambia has lead to 16 state secondary schools (out of 31) being equipped with state-of-the-art ICT labs. The schools received Pentium IV computers and were networked. The project was supported by the World Bank, but further funding has yet to be arranged for the other schools.

Internet connection at these schools has remained a challenge with only a select few schools currently having access. Most of the schools have their connection through a private sector initiative or NGO support

At the primary level, while there is no co-ordinated government initiative for ICTs, several initiatives by individuals and NGOs have helped equipped some schools with computer labs.

Current ICT Initiatives and Projects

Table 4 summarises the current and recent ICT initatives and projects in The Gambia.

Table 4: Summary of Current and Recent Initiatives and Projects

Project: Computer Literacy Programme: school teachers and principals, trained on keyboarding, word processing, basic troubleshooting and maintenance • *Ogranisation(s)/funding sources:* Department of State for Communication, Information and Technology; funded by the Government of The Gambia. • *Contact:* newgambia.gm
Project: Wider Net Project: setting up a small intranet comprising five work stations and a server • *Organisation(s)/funding sources:* University of Gambia • *Contact:* widernet.org
Project: iEARN Gambia: involves teachers in about 20 schools in collaborative project work • *Ogranisation(s)/funding sources:* Department of State Education • *Contact:* iearn.org
Project: Education Management Information System (EMIS): management of education resources (financial, material, and human); deployment of computers to secondary schools, and use of computer packages in teaching of science • *Ogranisation(s)/funding sources:* Department of State for Communication, Information and Technology; funded by the Government of The Gambia. • *Contact:* newgambia.gm
Project: Gambia-UNESCO ICT Fellowship Center: recognising ICTs in the service of persons with disabilities • *Ogranisation(s)/funding sources:* The National Federation of The Gambia, UNESCO clubs and centres, and the Department of State for Communication, Information and Technology • *Contact:* stockholmchallenge.se
Project: Peace Corps Computer Project: bringing computer equipment to Gambian Schools through donations • *Ogranisation(s)/funding sources:* Peace corps • *Contact:* iicd.org
Project: Gambia HELP Computer Project: building computer labs and teaching a key group of students and staff at each school the skills necessary to keep the labs up and running • *Ogranisation(s)/funding sources:* Gambia Help; funded by Rotary International/ Garfield High School's • *Contact:* gambiahelp.org
Project: Computer Training in Sierra Leone and The Gambia: train-the-trainer programmes that includes office applications and Web design • *Ogranisation(s)/funding sources:* Develop Africa, Inc. and individual donations

- *Contact:* universalgiving.org

Project: YMCA Computer Training Center: offering computer literacy classes, consultancy and customised IT training

- *Ogranisation(s)/funding sources:* British Volunteer Organisation (VSO); YMCA
- *Contact:* http://www.ymca.gm/

Implementing ICT in Education: What Helps and What Hinders?

Generally there is a commitment to improve ICTs in education in the Gambia. There are three major obstacles however:

- Gender bias in access to ICTs
- High attrition rate of teachers with ICT skills
- Heavy reliance on donor support for ICTs in education

Table 5 provides a summary of the current stage of ICT development in The Gambia in terms of enabling or constraining features in the education system.

Table 5: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraints
Policy framework and implementation plans	A commitment to policy development and political will at the ministerial level	
Advocacy leadership		Lack of adoption of ICT by teachers and school administrators
Gender equity		In some schools computer labs are opened after normal school hours, which is not conducive for girls' involvement.
Infrastructure and access		Unreliable electricity
Human resource capacity		High attrition rate of teachers who have ICT skills as they leave for the private sector
Learning content	A commitment to make ICT an examinable module	Lack of a standard ICT curriculum for all schools
Attitudes		Lack of adoption of ICT by teachers and school administrators

Sustainability		Too much reliance on donor and philanthropic funding

Notes

1. The World Factbook 2007. https://cia.gov/cia//publications/factbook/geos/ga.html
2. Country Brief: The Gambia. 2006. World Bank. http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/AFRICAEXT/GAMBIAEXTN/0,,menuPK:351648~pagePK:141132~piPK:141107~theSitePK:351626,00.html
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ICT in Education in Ghana

by Kofi Mangesi
April 2007

Source: *World Fact Book*[1]

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Overview

Ghana is in the process of finalising its ICTs in education policy, due to be ready by the end of the first quarter of 2007. Despite the unco-ordinated approach to policy in the past, significant progress has been made in increasing access to and usage of ICTs in the education sector. The tertiary sector is the most advanced in ICT deployment, followed by the secondary and primary/basic education sectors respectively. Overall there is much optimism for huge advances once the policy implementation begins.

Country Profile

Ghana has been a country of firsts. In 1957 it was the first country in sub-Saharan Africa to emerge from colonialism and—before an economic crisis in the late 1970s—experienced the highest GNP on the continent. Ghana also experienced the trauma of military takeovers long before others suffered similar fates, and it was among the first group of countries to subject itself to the African Peer Review Mechanism (APRM): an instrument voluntarily acceded to by member states of the African Union as a self-monitoring mechanism carried out by civil society and other stakeholders. Ghana's economy is mainly rural: cocoa, timber, and pineapples are the main export crops, and mining (mainly gold) has become one of the biggest sources of foreign exchange. The annual real GDP growth rate reached 5.8% in 2005, sustaining the growth rate observed in 2004.[2] Today Ghana runs a vibrant multi-party democracy, with a strong opposition in Parliament and an active civil society.

Table 1 provides some selected socio-economic indicators for the country.[2,3]

Table 1: Socio-economic Indicators: Ghana

Indicator	
Population	22.1 million
Languages	English
Adult literacy rate	57.9% (age 15 and over)
2005 economic activity (% of GDP)	Agriculture: 36.0 Industry: 25.0 Services: 38.6
Human Development Index	136 (out of 177 countries)
Human Poverty Index	58 (out of 102 countries)
Per capita gross national (US dollars)	$330 (2003); $380 (2004); $450 (2005)

The Educational System[4]

The new educational system consists of six years of primary school followed by three years of junior secondary and three years of senior secondary education at the end of which pupils sit for the senior secondary certificate examination (SSCE). The six years of primary education and the three years of junior secondary school (JSS) form nine years of

basic education, which is compulsory and free. Secondary education is not compulsory.

The system of higher education includes universities and university colleges, polytechnics, professional institutes, and pre-service training institutes. All public higher education institutions are under the National Council for Tertiary Education which forms an advisory and co-ordinating body at the national level. The Council is under the Minister of Education. Each higher institution has its own council and academic board (or their equivalents). The polytechnics, which are currently offering Higher National Diploma (HND) programmes, are now in the process of being upgraded to offer university-level courses. A new University of Development Studies has been opened in the north, and the University College of Education, Winneba, has become the University of Education, Winneba. Teacher-training colleges are to be upgraded to tertiary institution status.

Table 2 below provides a quantitative perspective of some selected system indicators.

Table 2: Selected Education Data[5]

Indicator	
Primary enrolment (% gross)*	80.5 (2003); 81.4 (2004)
Secondary enrolment (% gross)*	37.4 (2003); 41.8 (2004);
Primary completion rates (% of 6- to 12-year age group)	63.1 (2003); 65.4 (2004)
Tertiary enrolment (%gross)	2.8 (2003); 3.1 (2004)
Ratio of girls to boys in primary and secondary (%)**	0.9 (2003); 0.9 (2004)

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**Ratio of girls to boys is the percentage of girls to boys enrolled at primary and secondary levels in public and private schools.

ICT Policies

The Government of Ghana has placed a strong emphasis on the role of ICT in contributing to the country's economy. The country's medium-term development plan captured in the Ghana Poverty Reduction Strategy Paper (GPRS I&II) and the Education Strategic Plan 2003-2015 all suggest the use of ICT as a means of reaching out to the poor in Ghana.

National

In 2004 Parliament passed into law Ghana's ICT for Accelerated Development (ICT4AD) policy, which is currently at various stages of implementation. This policy represents the vision of Ghana in the information age and addresses 14 priority focus areas or pillars:[6]

- Accelerating human resource development
- Promoting ICTs in education – the deployment and exploitation of ICTs in education
- Facilitating government administration and service delivery
- Facilitating the development of the private sector
- Developing an export-oriented ICT products and services industry
- Modernising agriculture and developing an agro-business industry
- Developing a globally competitive value-added services sector – a regional business service and ICT hub
- Deploying and spreading ICTs in the community
- Promoting national health
- Rapidly developing ICT and enabling physical infrastructure
- Developing R&D, scientific, and industrial research capacity
- Providing legal, regulatory, and institutional frameworks
- Promoting foreign and local direct investment drive in ICTs
- Facilitating national security and law and order

At the national level, a proposed National Information Technology Agency (currently under the name of Ghana ICT Directorate) has been formed and a bill is awaiting parliamentary approval. A government interoperability framework has also been finalised and several ministries, departments, and agencies are at various stages of implementation.

Education sector

The ICT in education policy for Ghana had a long gestation period. An attempt at policy development for the sector predates the national ICT policy. A committee set up by the Ministry of Education, Youth and Sports outlined an ICT in education policy framework and produced a document that remained untouched for a long time. The objectives of the policy[7] were to:

- Ensure that students have ICT literacy skills before coming out of each level of education
- Provide guidelines for integrating ICT tools in all levels of education
- Provide means of standardising ICT resources for all schools
- Facilitate training of teachers and students in ICT
- Determine the type and level of ICT needed by schools for teaching and administration purposes.
- Promote ICT as a learning tool in the school curriculum at all levels

Through the help of various agencies, including Global e-Schools and Communities Initiative (GeSCI), a final ICTs in education policy document has been finalised and it is set to be released by the end of the first quarter of 2007.

Infrastructure

National

As one of the first African countries to liberalise its telecommunication sector, Ghana has made tremendous progress in ICT infrastructure deployment. But like many parts of Africa, the ICT revolution in Ghana has left behind the Internet and computing. There are also significant differences in urban and rural access to ICTs. Table 3 below provides some statistics on ICT infrastructure and usage in Ghana.

Table 3: ICT in Ghana

Indicators	Quantity
Fixed-line operators	2
Ghana Telecom	328,000
Westel	3,000
Total fixed-line telephone subscribers	331,000
Cellular mobile operators	4
Areeba	1,600,000
Tigo	530,000
One Touch	450,000
Kasapa	75,000
Total cellular mobile subscribers	2,655,000
Pay phones	
Ghana Telecom	10,872
Westel	165
Total pay phones	11,037
Internet data service providers	29
VSAT data operators	57
Public/corporate data operators	25
Internet users (2004)	368,000
Internet users per 100 inhabitants (2004)	1.72
Personal computers per 100 inhabitants (2004)	0.52
International voice gateways licence	4
International data gateways licence	29

Sources: National Communications Authority, and ITU Basic Statistics, 2005[8]

Education

The Ghanaian tertiary education sector is the most advanced in the deployment and use of ICTs in the country. All the country's major universities have their own separate ICT policy, which includes an ICT levy for students. This enables students to have access to 24-hour computer labs with broadband connection. However not all tertiary institutions in

the country are equally endowed and there are instances where the computer facilities are run purely by the private sector as cyber cafés on campuses.

In the basic and secondary education sector, a project to set up computer laboratories in all science schools in the country has lead to a significant number of computers being installed across the country. A computer levy of ¢30,000 (USD$3.20) is allowed to be in most secondary schools. There is, however, a great disparity between public and private schools as well as between urban and rural areas in access to ICTs.

In schools where ICTs exist, a number of teachers use the Internet for research. Smart boards and projectors are also available in such schools. The school curriculum, however, is not yet on CD, even though it has been a policy issue for many years.

Current ICT Initiatives and Projects

Table 4 summarises the current and recent ICT initiatives in Ghana.

Table 4: ICT Initiatives and Projects

Project: GeSCI – to expand the deployment of ICTs in schools in Ghana and to promote the effective use of these ICTs to achieve Ghana's educational and community development objectives. • *Organisation(s):* Ministry of Education, Youth and Sports • *Funding sources:* UNICT Task Force • *Contact:* www.gesci.org/gesci/publisher/index.jsp?aID=229&nID=111&pID=107
Project: Nepad E-Schools – supporting six schools in six regions with ICT infrastructure • *Organisation(s):* Ministry of Education • *Funding sources:* HP, Microsoft, Oracle, and Cisco • *Contact:* www.hp.com/hpinfo/newsroom/press_kits/2005/wsis/ov_nepad.pdf
Project: Intel-Elearning Centre (Accra girls) – pilot project to establish Africa's first WiMAX connected school • *Organisation(s):* Accra Girls' Secondary School • *Funding sources:* Intel • *Contact:* www.intel.com/pressroom/kits/worldahead/wa_backgrounder.pdf
Project: Presidential Special Initiative on Distance Learning – TV show on mathematics, science and English broadcast nationwide and sold on CDs • *Organisation(s):* Ministry of Education • *Funding sources:* Government of Ghana • *Contact:* www.iicd.org/photos/iconnect/Articles/iconnectarticles.2005-05-09.7326350124
Project: HP Digital Community Centre (KNUST) – high-speed ICT infrastructure at KNUST and for community learning and technology centers (CLTCs) • *Organisation(s):* KNUST • *Funding sources:* HP • *Contact:* http://h41111.www4.hp.com/globalcitizenship/uk/en/e-

inclusion/project/project_kumasi.html
Project: Research and Educational Network (REN) – to facilitate the interactions and collaboration between researchers in institutions and the world • *Organisation(s):* University of Ghana • *Funding sources:* Word Bank/InfoDev • *Contact:* www.ejds.org/meeting2003/ictp/papers/Intsiful.pdf
Project: GIMPA Distance Learning Centre – connecting policy and decision makers, managers, academics, politicians, professionals, development partners and donors, etc. to a global knowledge exchange • *Organisation(s):* GIMPA • *Funding sources:* Word Bank • *Contact:* www.gimpa.edu.gh/home/gimpa/index.php?option=com_content&task=view&id=35&Itemid=141
Project: APSnet) – has twinned with many schools abroad, including Denmark, Great Britain, Mexico, and the US, facilitating exchanges among teachers and students • *Organisation(s):* UNESCO • *Funding sources:* UNESCO • *Contact:* http://portal.unesco.org/ci/en/ev.php-URL_ID=20753&URL_DO=DO_TOPIC&URL_SECTION=201.html
Project: Microsoft Partners in Learning programme – supporting schools with technology and training • *Organisation(s):* Ministry of Education • *Funding sources:* Microsoft/Government of Ghana • *Contact:* www.edughana.net/partners_in_learning.htm
Project: Global Teenage Project – using the Internet and especially e-mail as a catalyst to structure exchanges between schools and teachers • *Organisation(s):* Rescue Mission Ghana • *Funding sources:* SchoolNet South Africa and International Institute for Communication and Development (IICD) • *Contact:* www.globalteenager.org.gh/
Project: Innovative Best Teacher Award – awarding teachers who excel in using ICTs in education • *Organisation(s):* Ghana Education Service • *Funding sources:* Government of Ghana • *Contact:* Ministry of Education
Project: Catch IT – fostering the development of ICT clubs throughout Ghana helps to prepare the youth for ICT related jobs • *Organisation(s):* African Youth Initiative (AYF)/One Village Foundation (OVF) • *Funding sources:* University of Education, Winneba, AYF partners, International Young Professionals Foundation • *Contact:* www.onevillagefoundation.org/ovf/projects.html
Project: Expanding Education Networking – involves 50 schools in Accra, Kumasi, Cape Coast, Tema and other areas • *Organisation(s):* iEARN /SchoolNet Ghana • *Funding sources:* SchoolNet Africa • *Contact:* www.iearn.org/globe/globe_Africa.html
Project: e-Education package for schools – offers affordable financing at competitive rates for qualifying educational institutions towards broadband Internet access via VSAT anywhere in

Ghana
- *Organisation(s):* Accelon, Standard Trust Bank, ICT Education Support Africa Foundation
- *Funding sources:* Accelon
- *Contact:* www.accelonafrica.com/ghana/aboutus.html

Implementing ICT in Education: What Helps and What Hinders?

Generally the commitment to improving the quality of education through ICTs is high both at the presidential and ministerial levels. Progress has been made on several fronts, but several other inhibiting factors exist including the following:

- Access to ICTs still remains highly inadequate and unevenly distributed through Ghana, with an urban bias.
- The capacity of teachers and educators to deliver policy still remains low with many averse to adopting ICTs in the classroom or with inadequate skills
- There is a lack of adequate collaboration between the Ministry of Education and Ghana Education service or other implementation agencies such as ministries, departments, and agencies.
- There are inadequate partnerships and collaboration between the ministry and the private sector.

Table 5 below provides a framework for understanding the core factors that help and hinder the development of ICTs in education in Ghana.

Table 5: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraints
Policy framework and implementation plans	Both the national and the proposed education sector polices provide clear strategies for achieving significant growth in ICTs and education.	Co-ordination among the various implementing agencies has not been as good and consolidation of activity is needed.
Advocacy leadership	The president has placed human resource development as part of his key objects and this is advocated by all sector ministries and departments within the education sector.	There is need for adequate resource to match the talk.
Gender equity	Both national and education policy focus on promoting gender equity.	The perception that science courses are for boys can hinder policy objectives.
Infrastructure and access	Progress has been made in these areas with many tertiary and secondary schools equipped with computer	Primary sector is still behind in access to infrastructure, especially in rural areas.

	laboratories.	
Collaborating mechanisms	With increasing support by major donors and the private sector, there is hope for meeting policy objectives.	Sustainability remains an issue.
Human resource capacity	A large pool of ICT training institutions is able to provide the training needs of teachers.	
Fiscal resources	Education continues to receive the highest percentage of the national budget	
Learning content		No structured ICT in school content is available.
Procurement regulations	Policy that encourages the setting up and sourcing of ICT equipment on the local market is emphasised.	
Attitudes	Positive attitudes with high levels of government.	Lower expectations of ICT at the school level among administrators.
Sustainability		Inability of certain schools to charge the mandatory ICT levy.

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Notes

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ICT for Education in Guinea

by Osei Tutu Agyeman
June 2007

Source: *World Fact Book* [1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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Overview

Guinea has begun the implementation of ICT in the tertiary education sector in collaboration with donors. Donor efforts have also recorded significant impact on the primary and secondary education sectors. Specifically, USAID has assisted Guinea under the GLOBE programme and launched other initiatives jointly with some state organisations.

Poor electrification and telecommunication infrastructure, however, hinders the process. Connectivity is limited to certain urban areas and power supply is at best irregular even in the administrative region in the capital city, Conakry, where the ministries and principal organs of state are located. This phenomenon among others presents challenges to the deployment of ICTs across the country, particularly in the education sector.

Country Profile

The Republic of Guinea is located on the west coast of Africa between Sierra Leone and Guinea-Bissau. It is a well-watered country with great agricultural potential. Guinea was colonised by France and became independent in 1958. Owing to the isolationist policies pursued by its first government, the country's economy suffered.

Table 1 provides some selected soci-economic indicators for the country.

Table 1: Socio-economic Indicators: Guinea

Indicator	
Population	9.95 million (2007)
Literacy	Male: 42.6% Female: 18.1% Total: 29.5% (2003)
Growth rate	2.62% (2007)
GDP (US dollars)	$3.8 billion (2006)
GDP per capita (US dollars)	$2,100 (2006)
Human Development Index	160 (out of 177 countries)[2]

The country has about one-third of the world's reserves of bauxite. Bauxite mining is the mainstay of the economy and contributes 70% to export earnings. About 80% of the country's workforce is in the agricultural sector, which contributes approximately 25.6% to the country's GDP. About 47% of the population lives below the poverty line.

Education System

As indicated below, there are four ministerial departments in charge of the various educational sectors:

- Pre-primary: Ministry for Social Affairs and the Promotion of Women and Children (MASPFE)
- Primary and secondary: Ministry for Civic and Pre-university Education (MEPU-EC)
- Vocational and professional: Ministry for Vocational and Professional Education (MET-FP)
- Tertiary: Ministry for Higher Education and Scientific Research (MESRS)

These four ministries, in collaboration with state organs and departments under the ministries and partners and donors, have reached various stages of implementation of ICTs in the different educational sectors. Government allocates 25.6% of budgetary resources to education.

Guinea has a system of six years of basic education and seven years of secondary education (four years for the first cycle and three for the second). Tertiary education varies from one to four years depending on the desired qualification. The compulsory age for schooling is seven years.

Table 2 reveals the enrolment figures for the different educational levels.[3]

Table 2: School Enrolment Statistics

Sector	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004
Pre-primary					67,881
Primary	790,497	853,623	997,645	1,081,192	1,163,126
Secondary	189,494	232,567	271,089	294,354	1,163,126
Vocational	11,049	13,166	13,085	13,360	14,947
Teacher training	1,269	2,132	2,530	2,155	3,582
Tertiary	11,682	13,500	14,819	16,361	22,223

The low enrolment in the vocational and professional sector is of concern to the government.

Infrastructure

Guinea's telecommunications infrastructure is the least developed in West Africa. The telephone density is only 0.3% for fixed lines and 1.7% for mobile/cellular phone penetration. However, between 2000 and 2005, the number of mobile phone users increased by 35%.

Table 3 provides a snapshot of the state of Guinea's telecommunications infrastructure and usage statistics.[4]

Table 3: ICT in Guinea

Indicator	
Telephones - main lines in use	26,200 (2005)

Telephones - mobile cellular	189,000 (2005)
Radio broadcast stations	5 FM; 3 shortwave (2006)
Radios	357,000 (1997)
Television broadcast stations	6 low capacity (2001)
Televisions	85,000 (1997)
Internet service providers	5 (2006)
Internet users	46,000 (2005)

The USAID Leland Initiative, an effort to extend Internet connectivity in African countries, served as the springboard for Guinea. Sotelgui, the country's main telecom operator was provided a high-speed Internet gateway under the project to which private Internet service providers (ISPs) could subscribe and sell Internet services to the public. USAID also assisted the two public universities, the universities of Conakry and Kankan and their remote campuses, to establish campus networks, Internet, and telephone connections – commercial services that could be extended to the larger public through wireless links and the Sotelgui infrastructure.

The drawback to these initiatives is the absence or irregularity of electric power supply in most parts of the country. Perennial power cuts are the norm and affect even the administrative district of Conakry.

About 30% of the Internet users are foreigners with the larger proportion of remaining users composed mainly of university students and faculty members.

ICT Policies

Guinea's NICI plan document was finalised in March 2002.[5] The plan provides for the creation of jobs through the use of ICTs and focuses on the following:

- Strengthening the ICT policy and regulatory process
- Educating and building capacity-building in ICT
- Developing infrastructure to provide the country and users with adequate bandwidth and applications
- Developing content and democratising access to all users, including civil society
- Promoting the participation of the private sector in ICT activities

The plan includes the following programmes that have a direct or indirect impact on education:

- Establishing a telephone and Internet network for higher education institutions
- Strengthening and expanding telecom, Internet, and TV infrastructure
- Expanding rural telephony and community telecentres
- Digitising the telecom network

The government's educational policy focuses on four basic objectives:

- 100% attendance for school pupils by 2015

- Promoting pre-school education
- Providing large access to professional and vocational training
- Promoting gender balance in education for the different regions of the country

The various educational levels have been impacted by the Education for All and gender equity projects with enrolment and completion rates having increased significantly.

Current ICT Initiatives and Projects

Basic and secondary education
The National Institute for Pedagogical Research and Action (Institute National de Recherche et d'Action en Pédagogie, INRAP) under MEPU-EC designed an interactive radio instruction programme for pupils in primary classes that effectively raised the levels of school attendance. The programme,[6] called Under the Kapok Tree, which develops both teachers and pupils, began in 2006, is aired 90 minutes per week for 22 weeks of the school year. It is estimated that 20,000 teachers and 900,000 pupils benefit from the programme. Lessons cover language, mathematics, science, community health, and early child development methods. To effectively implement the programme, the government distributed teachers' guides and wind-up radios that do not require electricity.

These activities are combined with bimonthly meetings and introductory workshops for teachers to give them necessary pedagogical support to adapt to the interactive style of teaching. USAID financed the project and jointly designed the content with INRAP.

USAID-Guinea also financed the participation of 14 primary, secondary, and professional schools in the GLOBE (Global Learning and Observation to Benefit the Environment) programme by donating one laptop to each of the schools for the students and teachers to collect data. Activities covered atmospheric research, soil, earth, biological, and geological data and information-gathering using scientific instruments provided by GLOBE.

This facility enabled the teachers and their students to share scientific measurements of geological systems and their observations with students and scientists throughout the world. The project is an international network of more than one million students in over 1,400 schools in 105 countries.

Tertiary level
Université de Conakry has a campus network maintained by a fibre optic backbone and 100BaseT Ethernet cables linking the buildings and faculties and 1,000 computers in the offices of lecturers and administrators.[7] Each faculty has a laboratory of five to nine computers for use by the lecturers and students alike. However, the PC-to-user ratio in the laboratories is 10:1,000.

The government established the network with assistance from the U.S. government at a cost of USD$2 million. The principal objective is to interconnect the network to the entire educational system in Guinea including the country's second university and other remote campuses. The latter are to be connected by wireless to the hub in the University of Conakry where the e-mail,

Web, and file servers are located. The university's Internet and telephone facility is serviced by a 3.5 metre diameter installed VSAT.

The Faculty of Science of the University of Conakry has, in collaboration with ISSEG, the Higher Institute for Science Education, developed e-content modules for mathematics, physics, biology, and chemistry. The success of the initial e-modules encouraged the university to increase the number of e-content courses. In early 2003, the Centre Universitaire de Labe, under the Université de Conakry, also produced an e-mathematics module. The university plans to establish resource centres nationwide to increase accessibility to these courses. Similarly, the University of Kankan is extending the network to its remote campuses.[8]

Other on-line university courses are offered in collaboration with the Agence Universitaire de la Francophonie (AUF) in the universities of Conakry and Kanakan and the decentralised campus of Labe.[9]

RESAFAD, the African network for distance education (Réseau Francophone de Formation à Distance), in collaboration with MEPU-EC, delivered teacher-training courses via the Internet to teachers in the country.[10] The courses were targeted at head teachers who manage schools of six or more classes and were aimed at raising the quality of school leadership and management.

About 960 head teachers were involved in the programme, which was intended to impact all primary school teachers following a cascading pattern of capacity transfer from the head teachers to teachers under their supervision.

The Department of Training Planning, Administration and Education Management (DFPAGE) in ISSEG was directly responsible for the implementation of the RESAFAD programme. A cyber café that can accommodate thirty people was set up for the teachers to use at ISSEG. Plans were made to establish cyber centres in the eight regions of the country to link the facility for teachers nationwide.

Generally, the RESAFAD project aims at assisting developing countries to participate in knowledge-based economies and uses ICT to provide state-of-the-art employment-focused education to deliver training to the workforce, thereby reducing the pressure on formal education systems.

Tertiary science education

The Fundamental Levels of Quality and Equity project, NFQE (Niveaux Fondamentaux de Qualité et Equité) also used multimedia tools and equipment to deliver its programmes.[11] This bi-modal training programme targeted at teachers and pupils was launched in 1997 and combined traditional teaching methods with radio and audiocassette in distance learning activities. The main components of the programme were:

- Leadership development support in education
- Assistance in the preparation of policy implementation
- Teacher training, specifically in time and class management, mathematical logic, reading and questions administration

- Training of teacher-trainers
- Development and improvement of teaching materials for pupils
- Building management capacity using computers
- Preparation of a national teacher-training policy

USAID-Guinea was the main financier of the NFQE project that ended in 2004. The programme impacted more that 1.5 million pupils, 25,300 teachers, and 4,000 head teachers nationwide. It offered more than 60 hours of training to elementary school teachers via the Internet, radio, and other media.

USAID signed an agreement with the University de Kankan to teach Internet and network courses.[12] This provided 33 computers – one to each of the 33 district education headquarters. However some of the DPEs do not have electric power supply and could not use their computers.

Other initiatives in teacher education

Other interventions have been recorded in the primary-teacher education contexts. ISFAD, Guinea's Higher Institute for Distance Education (Institut Supérieur de la Formation à Distance) launched a distance learning teacher-training programme to augment placements for teacher trainees. The distance learning candidates did not need to pass the teacher-trainee entrance exams. Rather, they paid fees annually and were required to pass only the annual examinations set by the examining board.[13]

ISFAD started the programme with 800 trainees in the 2003/2004 academic year and employed radio programmes in addition to course manuals to educate the teacher-trainees. There are plans to include video materials, but ISFAD has yet to acquire the equipment for video production.

The National Distance Teaching Service (Le Service National d'Enseignement à Distance) also uses audio materials, both radio and audiocassettes, to deliver French-language courses to teachers nationwide using material adapted from the AUF.

Adult education

In a bid to reduce the level of illiteracy in Guinea, ISSEG, though an institute for higher education, launched the POSCHIAVO adult education project[14] in collaboration with the Institut Suisse de Pedagogie pour la Formation Professionelle based in Lugano in Switzerland to teach people in disadvantaged and rural comities to read.

The Institut Supérieur des Sciences d' Éducation Générale (ISSEG),[15] a teacher-training establishment, partnered with the Service National d'Alphabétisation (National Literacy Service) and NGOs engaged in adult education activities and programmes. The NGOS provided 16 trainees, 12 of which were retained under the project after their training to undertake adult literacy teaching assignments in designated communities. The remaining four found jobs with other NGOs.

To ensure project sustainability, the literacy programme was integrated with a community development project for each beneficiary community. One village was assisted financially to build and operate a rice mill; another had a corn mill; and in another a cyber café was established.

In this project the communities, in collaboration with their trainer, identify a project and request assistance form POSCHIAVO to implement it. The communities refund 70% of the cost of their projects, and that money is used as a revolving fund to assist other needy villages or communities. Facilities are withdrawn from any community that refuses to refund the funds.

Initially POSHIAVO used e-learning resources to train the trainers provided by the NGOs. Once in the field, the Swiss donor also sent in trainers who helped the local trainers, over a two-week period per community, to deliver the literacy programmes where the trainers encountered difficulty. The involvement of the Swiss trainers was a quality improvement and evaluation strategy intended to ensure that the training approaches were well assimilated both by the trainers and the adult learners.

Generally, the POSCHIAVO project used training and communication resources offered by Internet to optimise literacy and community development and to organise a network of micro-projects focused on education for community development and quality improvement. The project aims at replicating the literacy and micro-project activities nationwide.

There are two components to the course content for the trainers: ICT and community development. ICT covers Microsoft Office applications: such as Word, Excel, and PowerPoint, while community development covered family budgeting, micro-enterprise management, preparing community development micro-projects, community health, and social psychology.

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in Guinea in terms of enabling or constraining features in the education system.

Table 4: Factors Influencing ICT Adoption

Sectors	Enabling features	Constraining features	Risk factors
ICT deployment	• Installation of the high-speed Internet facilities in Sotelgui and the universities. • Extension by the universities of Internet and other services to the public via wireless links and Sotelgui.	• Universities financially constrained from extending the facilities even on the campuses. • Private sector ISPs emphasise commercial service against community service. • Low levels of ICT literacy in the general and teaching population.	• Possibility of failure of government or universities to renew or maintain installed facilities. • Inability of government to extend ICT infrastructure due to financial and budgetary constraints.

Non-formal education	The establishment of 300 NAFA centres (rural second-chance schools) for drop-outs or unenrolled children by the UNDP.	Insufficiency of project funds for the establishment of NAFA centres to cover all the needy communities in the country.	Financial means to continue and maintain the facilities after project completion.
Gender equity	Girls accorded 80% priority enrolment in the NAFA centres.	Tradition keeps girls from being educated, especially in the rural areas.	Abandonment of the priority policy for girls with time.
Vocational and professional education	Government policy to increase the number of schools and enlarge the intake of vocational and professional student populations.	Government budgetary constraints.	Student preference for academic to professional/vocational training.
Community-focused education	The plan to extend the POSCHIAVO and similar projects to other disadvantaged and rural communities.	Poor financial management practices or attitudes of trainee associations in deprived communities.	Possibility of project bankruptcy owing to the refusal of communities to reimburse scarce project funds.
ICT policy implementation	Policy developed and announced and options advertised.	Slow pace of deregulation and privatisation of the communications sector.	

Notes

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ICT in Education in Guinea-Bissau

by Osei Tutu Agyeman
June 2007

Source: *World Fact Book*[1]

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Overview

Guinea Bissau is a small country of fewer than two million inhabitants. Civil war in the late 1990s destroyed its infrastructure and economy and displaced hundreds of thousands of its population. Recent multi-party elections installed a civilian regime in 2005. A key priority of the new government is infrastructure reconstruction, including those related to education, telecommunication, and electric power. The government of Guinea Bissau has obtained assistance from the African Development Bank and the World Bank to rehabilitate some of the destroyed infrastructure. That said, the state of telecommunications is quite poor and the electricity supply is sporadic.

Country Profile

The Republic of Guinea-Bissau borders the North Atlantic Ocean and lies between Senegal and Guinea on the West African mainland with 18 islands off the coast. The country covers 36,120 square kilometres of land and has a population of 1.586 million.

There are 21 living languages spoken in Guinea-Bissau with the most prominent being the Balanta Ketonho. The elite in the civil and public services speak Crioulo, a mixture of Portuguese and ethnic languages. Portuguese is the official language.

Guinea Bissau is classified 172nd out of 177 countries featured in the United Nations Human Development Index of 2004, with 88% of the population living on less than USD$1 a day. Agriculture is the dominant economic sector and engages 82% of the labour force with the remaining 18% in the industrial and services sectors. Industry contributes approximately 15% to GDP and includes a sugar refinery, a rice and groundnut processing plant, brewing, and urban construction. Guinea Bissau ranks sixth in the world for cashew-nut production.

The recent discovery of oil fields along the coast, with estimated production capacity of 30,000 to 60,000 barrels per day, has restored hope and should contribute to the resolution of the country's recurrent government budgetary problems.

Table 1 provides some selected soci-economic indicators for the country.

Table 1: Socio-economic Indicators: Guinea Bissau

Indicator	
GDP (US dollars)	$295.1 million (2006)
GDP per capita (US dollars)	$192
Growth rate	2.9% (2005)
Inflation (% of GDP)	-0.7% (2005)
Budget balance (% of GDP)	-10.1% (2005)
Investment (% of GDP)	12.8% (2005)
Domestic saving (% of GDP)	-1.4% (2005)
Total debt (% of GDP)	279.3% (2005)

The current poor economic situation is the result of six turbulent years, beginning with the civil war from 1998 to 1999, which destroyed most of the country's infrastructure.

The Education System

Primary education consists of four years followed by secondary education which takes three to six years in the specific field of choice. Education is compulsory from age seven to 13, but in 2000 UNICEF estimated that 65.4% of children between the ages of five to 14 years in Guinea Bissau were engaged in trading, farming, or domestic labour. The numbers are worse during the cashew harvest when school-going children are withdrawn from school to work the fields.

Adult literacy rate was projected at 58.1% for males and 27.4% for females in 2003.[2] Youth literacy rates[3] (between ages 15 to 24 for both sexes) stood at 61% in 2002.

Infrastructure

Telecommunications

In 2003 there were 10,600 main telephone lines, fewer than the 13,120 in 1997. The decline was because of the destruction of the telephone infrastructure during the war. By 2005 the number had increased again and there were 67,000[4] mobile phones in use– an average of 49 per 1,000 people.

Internet access is available only in Bissau, the capital, where many cyber cafés offer low-speed connection. The youth are mainly the occasional users of the Internet. In 2006 Guinea Bissau had about 30,000 Internet users.

There is no nationwide coverage of the mobile phone networks. Only Bissau, the capital, boasts two operators: Areeba and Telecel. Further, there is a limited number of fixed lines in the other big cities and localities. There is no telephone infrastructure, mobile or fixed, or Internet in the rural areas.

Electric power supply

Electrification covers only 12%[5] of the country and tariffs are five times the levels of its neighbour, Senegal. Currently, only Bissau has power supply for 18 hours a day, from 6 p.m. till noon of the next day. The other big cities like Bafata, Cacinek Cachea, and Catio usually have power supplied from 6 p.m. till midnight of each day.

It is unusual for the national electricity company to provide power 24 hours a day: the financial difficulty it faces has made it impossible to purchase fuel to power the generators. It is estimated that the envisaged Saltino hydroelectric dam[6] to be constructed to span the Corubal River will be able to meet about 60% of the country's energy needs by 2015.

ICT Policies

Guinea Bissau has no ICT policy.[7] There is also no evidence at present of the government moving to initiate one. However, the country promulgated its Telecommunications Basic Law, Decree No. 03-99 in 1999. That decree stipulates, among other things, the need to:

- Promote the development of telecommunications in Guinea Bissau through the definition of an adequate legal framework in accordance with globalisation demands
- Promote and emphasise the role of telecommunications as a fundamental instrument in economic and social development
- Create conditions favourable to the emergence and development of competition in the telecommunications sector in order to facilitate access to users of new services at the best prices
- Develop and improve telecommunications services for public use aiming at better coverage nationwide in terms of universal access to telecommunications

The government deregulated the telecommunications sector and, in 2003, replaced Guinea-Telecommunications, the national carrier, which till then was owned by Portugal Telecom (51%) and the state (49%). The new company, Guinetel,[8] is 90% state-owned; the company's workers own the other 10%. This move was meant to break the monopoly of Portugal Telecom and make way for cellular and mobile telephone operators to invest in the telecommunications sector. The 20-year contract signed with Portugal Telecom expires in 2009.

Education policy

In April 2000, the Ministry of Education Science and Technology launched its educational policy[9] that sought to:

- Correct the inadequate number of trained and qualified personnel in the workforce
- Identify priorities in the development of realistic plans and strategies with a view to halting the degradation of the quality of teaching
- Concentrate on implementing an assistance project for the basic education sector with funding from the government, the World Bank, and the Swedish International Development Agency (SIDA)

Primary education

The civil war of 1998 to 1999 displaced both the population and the schools leaving destroyed buildings, furniture, and equipment. In April 2000, 10% of the schools were one-graders, 26% were two-graders, and 50% were four-graders with unqualified teachers having only four years of basic education.[10]

Children take about three times as long as expected to complete the curriculum because schools run three to four rotational shifts of pupils daily due to inadequate infrastructure. As well, the teachers are often on strike because the government fails to pay them.

In some communities, like the village of Kampada Namoante,[11] children haul their own seats to school while teachers turn up carrying blackboards. In one community, the poor cashew-nut farmers pooled their resources and built their own community school and appointed teachers whom they pay monthly. The teachers' monthly pay may be a few coins or mangoes or whatever

is harvested from the field – whatever the parents can afford. This is the heritage left by the civil war.

In 2006, in an effort to reduce the adult illiteracy rate, the African Development Bank (ADB) agreed to finance Guinea-Bissau's modest reconstruction project to improve the supply and quality of primary education. The project envisages the following:

- The construction of 220 new classrooms including 80 to replace the *barcas* built from palm leaves and thatch
- The rehabilitation of 100 damaged schools
- The construction of 50 annex buildings
- The provision of basic furniture and equipment for the new classrooms
- The extension and systematisation of two vocational training centres currently not in use to provide 21 basic trade courses

The project will offer 15,000 additional places in the school system and facilitate raising the basic enrolment rate of primary education from 60% to 70% in 2007. In addition, the project offers workers the opportunity to hone their skills while in service. It should equally facilitate the sensitisation of the population on sexually transmitted diseases, AIDS, and malaria.

Though the government wishes to introduce information technology courses into the primary school curriculum, it has to settle for the modest rehabilitation and reconstruction of basic schools nationwide owing to financial constraints. The government will fund 10% of the project costs of USD$11.3 million.

Secondary, vocational, and technical education

In 2000, only 8,000 students, constituting 6% of the eligible age group, were registered in the 15 public secondary schools, despite their being available placements for 26,000. The country lacks technical schools that can train and adapt graduates for the employment market.

The ADB project is meant to provide mechanisms for the integration of vocational skills into the educational system countrywide. Two vocational institutes are to be rehabilitated under the project to prepare 7,000 learners of 21 basic trades for their first job.[12]

Tertiary education

In 1997 tertiary[13] education catered for about 1,000 students: 64in medicine, 300 in law, 400 in education, 120 in nursing, and 84 in sports. The two most important institutions, the schools of Law and Medicine, are almost completely financially dependent upon foreign assistance. The financial and technical dependency of these schools causes systematic delays throughout the academic year.

The very first university in Guinea Bissau, the Universidade Colinas de Boé (UCB),[14] was established in September 2003 by the International Finance Company, a private sector branch of the World Bank, to provide business and management training. It is housed in a renovated cashew-nut factory, and it has only a few computers and a specialised library endowed with about

600 titles. UCB has highly trained faculty; most of the professors are active business people or managers in the public service. However, the faculty lacks ICT skills.

The second, which was established in 2004, Universidade Amilcar Cabral (UAC),[15] is Guinea Bissau's public university. It has strong government support and budget allocation. The university is partnering with a Portuguese university, l'Universidade Lusofona de Lisboa (ULL), to deliver the programmes in its schools in Bissau.

UAC is located in a former army base near the city centre in Bissau. It has 16 classrooms and well-equipped facilities. It also has a few computers and has made ICT a priority. It uses the library run by INEP, the National Institute for Research, which is the country's best and largest library in Lusophone Africa. UAC is larger than UCB and has more students. It has hitherto functioned as a vocational/professional training institution.

CENFA's headquarters is in Bissau with campuses in three other provinces. CENFA and UAC are publicly owned but privately managed, while UCB is a purely private institution. CENFA has low-trained faculty[16] and its only library was looted during the civil war.

Implementing ICT in Education: What Helps and What Hinders?

There is little that can be said about enabling factors in ICT development in the country. Assistance from donors and banks should help re-launch its economy and the required infrastructure that can contribute to the deployment of ICTs. Till then, the following are some of the impediments to the meaningful introduction of ICT into the curriculum at all educational levels in Guinea-Bissau:

- The government's limited and inadequate budgetary and financial resources
- The lack of high level information technology training institutes or schools
- The general lack of ICT skills in the teaching population
- The low levels of trained teachers
- The poorly equipped training institutions
- The irregular and insufficient electric power supply across the country that obliges the citizenry to resort to fuel-powered generators for their individual energy needs at great cost - a cost that cannot be borne by the national government in the educational sector even when computers are made freely available by donors
- The inadequate and unavailable telecommunication infrastructure and services including Internet
- The concentration of national efforts on the massive reconstruction and rehabilitation of infrastructure destroyed in the 1998-1999 civil war

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ICT in Education in Kenya

by Glen Farrell
April 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

The findings, interpretations and conclusions expressed herein are entirely those of the author(s) and do not necessarily reflect the view of *info*Dev, the Donors of *info*Dev, the World Bank and its affiliated organizations, the Board of Executive Directors of the World Bank or the governments they represent. The World Bank cannot guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply on the part of the World Bank any judgment of the legal status of any territory or the endorsement or acceptance of such boundaries.

It is expected that individual *Country Reports* from the *Survey of ICT and Education in Africa* will be updated in an iterative process over time based on additional research and feedback received through the *info*Dev web site. For more information, and to suggest modifications to individual *Country Reports*, please see www.infodev.org/ict4edu-Africa.

Overview

Kenya has made remarkable progress putting in place an ICT policy framework and implementation strategy, complete with measurable outcomes and time frames. The process has had the benefit of sound advice from officials and stakeholders and, perhaps more importantly, strong leadership from the office of the Permanent Secretary of the Ministry of Education. However, universal implementation is challenging given the lack of resources, national ICT infrastructure, and even electrical supply – particularly in the rural areas.

Country Profile

Kenya has faced many challenges in its efforts to reform its institutions and processes. However, there has been progress: education reforms have translated into more children in school; the incidence of HIV/AIDS has fallen from 11% to 6.1% over the last five years; and access to better water and sanitation is improving. Further, the country has recorded two years of positive growth (4.3% in 2004 and 5.8% in 2005). Like many developing countries, there is a continuing population shift from rural to urban.

Table 1 provides some selected socio-economic indicators for the country.[1,2,3]

Table 1: Selected Country Data

Indicator	
Population	34.3 million (2005)
Languages	English, Swahili, and 40 local ethnic languages
Adult literacy rate	73.6% (2004)
2005 Economic activity (% of GDP)	Agriculture: 27.4% Industry: 17.8% Services: 54.9%
Human Development Index	152 (out of 177 countries)
Human Poverty Index	60 (out of 102 countries)
Per capita gross national income (US dollars)	$430 (2003); $480 (2004); $530 (2005)

The Education System

Kenya has an 8-4-4 education system. Primary schooling takes eight years, followed by four years of secondary schooling and four years of first degree studies at university. The country introduced universal, free, non-compulsory access to primary education in 2003 that led to an immediate increase of 1.3 million students. This growth has created an accumulating demand for access to secondary education and, predictably, to tertiary education as well.

The tertiary sector includes universities, teacher-training colleges and institutes, and technical training institutions. There are 25 universities: seven are public, 12 are private but have full accreditation or interim approvals, and six are theological institutions recognised by the Higher Education Commission. With the exception of the theological institutions, the universities receive funding from government even though they are autonomous.

There are four national polytechnics, 17 institutes of technology, and 20 technical training institutes. Six secondary-level diploma colleges and 20 primary-level training colleges provide teacher training.

Table 2 provides a quantitative perspective of some selected system indicators.[4]

Table 2: Selected Education Data

Indicator	
Primary enrolment (% gross)*	From 97.7 in 2000 to 111.3 in 2004
Secondary enrolment (% gross)*	From 39.2 in 2000 to 48.0 in 2004
Transition to secondary	From 30% in 2004 to 54% in 2005 with a target of 70% by 2008
Tertiary enrolment	3% gross in 2004
Gender equity index	0.94 in primary; 0.86 in secondary; 0.58 at university;

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.

ICT Policies

National

After several years of effort,[5] Kenya promulgated a National ICT Policy in January 2006 that aims to "improve the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services."[6] The national policy has several sections, including information technology, broadcasting, telecommunications, and postal services. However, it is the section on information technology that sets out the objectives and strategies pertaining to ICT and education. The relevant objective in this section states that government will encourage "…the use of ICT in schools, colleges, universities and other educational institutions in the country so as to improve the quality of teaching and learning." The related strategies, under the heading "E-Learning," are to:

- Promote the development of e-learning resources.
- Facilitate public-private partnerships to mobilise resources in order to support e-learning initiatives

- Promote the development of an integrated e-learning curriculum to support ICT in education
- Promote distance education and virtual institutions, particularly in higher education and training
- Promote the establishment of a national ICT centre of excellence
- Provide affordable infrastructure to facilitate dissemination of knowledge and skill through e-learning platforms
- Promote the development of content to address the educational needs of primary, secondary, and tertiary institutions
- Create awareness of the opportunities offered by ICT as an educational tool to the education sector
- Facilitate sharing of e-learning resources between institutions
- Exploit e-learning opportunities to offer Kenyan education programmes for export
- Integrate e-learning resources with other existing resources

Education Sector

The Ministry of Education developed a Kenya Education Sector Support Program (KESSP) in 2005 that featured ICT as one of the priority areas with the aim of mainstreaming ICTs into the teaching and learning process. The National ICT Policy embedded this intent as a national priority and provided the impetus for the ministry to develop its sector policy on ICT in Education.

The ministry moved quickly and, in June 2006, introduced the National ICT Strategy for Education and Training.[7] This document, referred to as the ICT policy for the education sector, consists of the following components, each with its own statement of strategic objectives and expected outcomes:

- ICT in education policy
- Digital equipment
- Connectivity and network infrastructure
- Access and equity
- Technical support and maintenance
- Harnessing emerging technologies
- Digital content
- Integration of ICT in education
- Training (capacity-building and professional development)
- Research and development

The Ministry of Education was given the mandate to lead the monitoring and evaluation of the strategy's implementation, guided by overall government policies on education and ICT, specific education strategic documents for implementing its mandate, and global goals such as Education for All (EFA) and the Millennium Development Goals (MDGs).

This mandate is carried out through a ministerial ICT committee that meets monthly and reports quarterly on progress. The committee is chaired by the Permanent Secretary and supported by the ministry's ICT Unit. It has representation from stakeholders involved in

implementing the strategy and mobilising resources such as donors and private sector partners.

The implementing agencies include:

- The Semi-Autonomous Government Agencies (SAGAs) of the ministry
- The Network Initiative for Computers in Education (NICE), a consortium of NGOs involved in ICT in the education sector
- Individual NGOs that meet specified criteria
- Civil society organisations involved in ICT in education activities
- Academia and/or individuals with experience in ICT in education projects

Another key part of the implementation strategy is the Kenya ICT Trust Fund,[8] formed in 2004, with the aim of spearheading ICT initiatives in education. Membership is open to public sector organisations such as ministries and other government institutions, private sector companies, donor partners, civil society, as well as academic and other educational institutions. In general, the objective is to facilitate public-private partnerships (PPPs) that will mobilise and provide ICT resources to Kenyan public schools and community resource and learning centres. It hopes to achieve the following goals over the next five years:

- Resource mobilisation for delivery of ICT infrastructure to schools
- E-readiness assessment for secondary schools, tertiary institutions, and primary schools
- Development of a portal for ICT information sharing
- Establishment of a national computer assembly centre

Member partners can apply for project funds to implement various ICT components that are outlined in the Kenya ICT Trust Fund's objectives.

Each university in Kenya has developed its own ICT policy. However, the three East African higher education regulatory agencies, including the Kenyan Commission for Higher Education**,** signed a memorandum of co-operation in July 2006 intended to streamline and harmonise accreditation and quality assurance practices and procedures in the region. This is expected to enhance access to quality higher education and accelerate response to new opportunities for e-learning, use of virtual universities, and other modes of distance and open learning.[9]

Infrastructure

With limited access to electricity and phone lines, few people in Kenya have a computer at home. Radio and television access is much better. On the other hand, mobile phones are commonplace and the number of Internet users is increasing rapidly due to the number of Internet cafés, shops, and access centres that are available, particularly in urban areas. Because English is widely used in Kenya, usage may be affected since most sites on the Internet are in English.

Table 3 provides a statistical overview of the ICT infrastructure that is available to the general population.[1,10]

Table 3: ICT in Kenya

Telephone lines (2005)	281,800 (2005)
Mobile telephones (2006)	4,612,000 (2006)
Internet users (3.1% of the population)	200,000 and 1,054,900 (2000 & 2006)
Internet hosts	13,274 (2006)
Television broadcast stations	8 (2002)
Radio stations	24 AM; 18 FM (2001)

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Schools

The ministry's policy framework indicates that there are a number of challenges concerning access to and use of ICT in Kenya, including high levels of poverty, limited rural electrification, and frequent power disruptions. Most secondary schools have some computer equipment; however, this could consist of one computer in the office of the school head. Very few secondary schools have sufficient ICT tools for teachers and students. Even in schools that do have computers, the student-computer ratio is 150:1. Most of the schools with ICT infrastructure have acquired it through initiatives supported by parents, the government, NGOs, or other development agencies and the private sector, including the NEPAD e-Schools programme.[11] Attempts to set up basic ICT infrastructure in primary schools are almost negligible.

The core problem is that Kenya lacks adequate connectivity and network infrastructure. Although a small number of schools have direct access to high-speed connectivity through an Internet service provider, generally there is limited penetration of the national physical telecommunication infrastructure into rural and low-income areas. Consequently, there is limited access to dedicated phone lines and high-speed connectivity for e-mail and the Internet. Even where access to high-speed connectivity is possible, high costs remain a barrier to access. As well, very few schools can afford to use VSAT technology. Roughly 10% of secondary schools with computers are able to share teaching resources via a LAN. As a solution to these access problems, the ministry hopes to leverage the e-government initiative of networking public institutions countrywide to facilitate connectivity for the educational sector.

Infrastructure can also be organisational in nature. There are three organisations of critical importance in the context of ICT development in Kenyan schools.
One of these, the Kenya ICT Trust Fund,[8] facilitates mobilisation of resources to provide ICT to schools and communities and acts with its members as a co-ordinating body for sharing information about priorities and developments.

The second component of the education system infrastructure is the Kenya Institute of Education,[12] which has a mandate to:

- Prepare syllabuses, publish, and print materials
- Develop digital curriculum content
- Provide teacher in-service training
- Develop and transmit programmes via mass media to support educational development (Note: in the context of the ICT in Education Strategy, KIE is to explore the use of a broadcast channel for non-formal education.)
- Prepare distance learning materials
- Conduct research on educational matters

The third component is the Non-Government Organizations Network Initiatives for Computers in Education (NICE), an umbrella agency whose members are non-governmental oganisations involved in the introduction and use of ICTs in schools. NICE provides a co-ordinating and rationalising function and, through its membership in the Kenya ICT Trust Fund, ensures that the work and needs of its members are known and considered in the Fund's decision-making processes.

Universities

According to a World Bank Institute survey,[13] the state of ICT infrastructure in African universities can be summed up as "too little, too expensive, and poorly managed." The survey report goes on to say that "the average African university has bandwidth capacity equivalent to a broadband residential connection available in Europe, [and] pays 50 times more for their bandwidth than their educational counterparts in the rest of the world." Another study[14] carried out for the African Virtual University (AVU) found that while most of the partner institutions either have an ICT policy in place or are developing one, they lack the resources to implement it.

This situation may be changing however. Two countries in sub-Saharan Africa, Kenya and South Africa, have already developed national research and education networks, and several others are in the process of doing so. The goal of the Kenya Education Network[15] (KENET) is to "establish sustainable communication and networking among educational institutions in Kenya that will facilitate wide use of Internet technology in teaching, research, and sharing of other information resources to the general populace at affordable cost." This initiative is spearheaded by Kenya's institutions of higher learning to establish a high-speed, reliable, and sustainable network for the interconnectivity of all learning institutions.

The current objectives of KENET are to:

- Establish an Internet infrastructure for educational institutions
- Provide affordable tariffs

- Develop human resources in information content development, information management, and communication technology to support, operate, and manage KENET
- Develop and improve local content

KENET members benefit by receiving substantially lower connectivity costs, as well as having access to technical support and staff training. In November 2006, Kenya entered into partnership with a global telecommunications service provider, Etisalat, to lay the undersea fibre optic cable, popularly known as the East African Marine Systems, that will connect eastern and Horn of Africa countries to the rest of the world.

Current ICT Initiatives and Projects

Kenya has placed considerable emphasis on the importance of ICT in its Education Sector Support Programme as evidenced in the recent promulgation of the National ICT Strategy for Education and Training. The Ministry of Education has taken steps to support the implementation of the strategy either by direct action or through the various institutions and agencies with which it works. In addition, there are many other organisations not involved directly with the Ministry of Education that continue to be active in implementing and supporting projects involving ICT in education.

Table 4 is a synthesis of ICT activities and projects.

Table 4: ICT Initiatives and Projects

Project: The Learning Resource Centre: Offers training in educational management and integration of ICT for school managers, lecturers, and students. • *Organisation(s):* Kenya Technical Teachers College in Nairobi • *Funding source:* Flemish Association for Development and Technical Assistance and UNESCO (during the first year) • *Contact:* www.vvobkenya.org/sites/LRCVVOB/index.htm
Project: Provision of computers and training: A primary example of the several NGOs with similar goals that collaborate under the NICE umbrella. • *Organisation(s):* Computers in Schools • *Funding source:* Multiple partners and sources (see list on Web site). • *Contact:* www.cfsk.org/home.htm
Project: ICT equipment for schools: Computers purchased for 142 schools in support of the ICT in Education Strategy. • *Organisation(s):* Kenya ICT Trust Fund • *Funding source:* Ministry of Education • *Contact:* www.education.go.ke/ICTFund.htm
Project: Mukuru ICT Centre: ICT skill development for under-privileged youth opened as part of

the Mukuru Promotion Centre in Nairobi run by the Sisters of Mercy.

- *Organisation(s):* Corporate consortia led by British Airways
- *Funding source:* British Airways, Microsoft, Cisco, and others.
- *Contact:* www.education.go.ke/ICTFORUM/ICT%20in%20Africa%20&%20Mukuru%20-%20Mrs.%20Mary%20Barry.pdf

Project: Development of Learning Content: digitisation of curriculum content for delivery in schools.

- *Organisation(s):* Kenya Institute of Education
- *Funding source:* Ministry of Education
- *Contact:* www.kie.go.ke/

Project: Support Centres: Central and regional centres provide immediate solutions on ICT issues to schools via telephone or online inquiries.

- *Organisation(s):* Ministry of Education
- *Funding source:* Microsoft and the ICT Trust Fund
- *Contact:* www.education.go.ke/Speeches/MN_ICT_Strategy_2August2006.html

Project: Sponsored Schools: The introduction of computers and distance learning to supplement teaching and improve learning methods in Aga Khan schools in Kenya.

- *Organisation(s):* Aga Khan Education Services
- *Funding source:* Aga Khan Foundation
- *Contact:* Aga Khan Foundation's education activities, www.akdn.org/agency/akf_concerns.html#education.

Project: Internet cafés: More than 400 Internet cafés have been opened in urban and rural areas where there is electricity.

- *Organisation(s):* Telcolm Kenya
- *Funding source:* Telcolm Kenya
- *Contact:* Dr. Speranza Ndege, www.elearning-africa.com/newsportal/english/news19.php

Project: NEPAD e-Schools Initiative: Multi-partner demo project that equipped six secondary schools with state-of-the-art ICTs and provided teacher training and learning content.

- *Organisation(s):* e-Africa Commission, Ministry of Education, and two consortia led by Oracle and Microsoft
- *Funding source:* Oracle, Microsoft, and the Ministry of Education
- *Contact:* www.eafricacommission.org/docs/NEPAD%20e-SCHOOLS%20DEMO%20OVERVIEW.pdf

Project: Agricultural Non-formal Education: A farmers' resource centre in Mwingi district that functions as a community information supermarket is equipped with a computer, a WorldSpace radio, a digital data adapter, a printer, a mobile phone, and several informational CDs.

- *Organisation(s):* Arid Lands Information Network-Eastern Africa (NGO) and the Ministry of Agriculture
- *Funding source:* FORD Foundation, NOVIB, DFID, and OXFAM-GB
- *Contact:* www.alin.or.ke/about/who.asp

Project: Computer Skill Development: A free e-learning programme in computer skills for youth living in the slum areas of Nairobi.

- *Organisation(s):* Nairobits, an NGO run by local staff
- *Funding source:* Dutch and Irish computer experts
- *Contact:* www.developments.org.uk/data/Issue22/e-for-education.htm

Project: KENET Initiative: An initiative that will establish permanent high-speed Internet infrastructure in 22 institutions in the next 12 months; establish or improve node infrastructure within each strategic institution; connect 30 tertiary institutions to the backbone within two years; and expand to 600 secondary and primary schools within two years.

- *Organisation(s):* KENET
- *Funding source:* Ministry of Education, ICT Trust Fund
- *Contact:* www.kenet.or.ke/about/index.php?yah=mission&yeh=objectives

Project: Crossing Borders – East, West, Southern Africa and Central Africa: A cross-cultural distance learning scheme linking young African writers to experienced UK mentors.

- *Organisation(s):* Lancaster University
- *Funding source:* British Council
- *Contact:* www.crossingborders-africanwriting.org/about/

Project: School Broadcasting: After a successful one-year pilot, there is now a plan to revive Kenya's nationwide school broadcast service, using WorldSpace technology to broadcast educational content to 11 million students in 18,000 primary and 3,000 secondary schools by the end of 2006.

- *Organisation(s):* Kenya Institute of Education (KIE) and WorldSpace
- *Funding source:* WorldSpace Incorporated
- *Contact:* www.itu.int/partners/project.asp?lang=en&id=58

Project: The AVOIR Project: A collaboration among 14 universities to produce educational software while at the same time building software design, development, and support capacity in the higher education sector.

- *Organisation(s):* University of Nairobi and Jomo Kenyatta University of Agriculture and Technology
- *Funding source:* IDRC, Department of Science and Technology (South Africa), UNESCO, Carnegie Corporation, USAID, Sun Microsystems, International Oceanographic Data and Information Exchange
- *Contact:* http://avoir.uwc.ac.za/avoir/index.php?module=cms&action=viewsection&id=gen12Srv48Nme23_2

Project: Free Software Licenses: Microsoft Corporation is providing free access to its operating software for schools and higher education institutions in order to reduce the cost of buying and using computers. The company will work with the organisations involved in supplying computers to the institutions to install the software on the machines.

- *Organisation(s :* Microsoft and the Ministry of Education
- *Funding Source:* Microsoft
- *Contact:* ICT Director, Ministry of Education, Kenya

Implementing ICT in Education: What Helps and What Hinders?

The core factors that influence the adoption and diffusion of ICTs in education have been identified in many studies and project reports such as the UNESCO *Meta-survey on the Use of Technologies in Asia and the Pacific*[16] and, in the context of East Africa, by IDRC in its thorough analysis of ICT policy-making in the region.[17] Two other studies that have discussed some of these factors in the higher education sector are those carried out by the United Nations National University[18] and by the African Virtual University.[19] What emerges from these analyses is that the factors are essentially the same in both developed and developing economies, although they differ in terms of importance depending on which side of the "digital divide" they are viewed from. What differentiates the rate of adoption and diffusion is not a difference in the factors at play, but rather the degree to which they have been developed or are present in a given country.

Table 5 provides a summary of the current stage of ICT development in Kenya in terms of enabling or constraining features in the education system.

Table 5: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation plans	Kenya has a sophisticated ICT in Education Strategy and Implementation Plan. It is embedded in the national ICT policy and was developed through a consultative process with stakeholders. The plan has costing estimates, time lines with measurable outcomes, and specified lead agencies. Support is widespread.	
Advocacy leadership	The Minister of Education and the Permanent Secretary demonstrate a very strong commitment to the importance of ICT in education.	
Gender equity	Equity of access is stressed in policy and implementation documents. Usage in schools is reported to be equitable.	Female participation rates are equal at the primary level, decline in secondary, and drop significantly at tertiary levels.
Infrastructure and		The lack of national infrastructure

access		seriously constrains the use of ICTs in schools, particularly in rural areas. And the lack of reliable and affordable access to the Internet is a further serious constraint. Inter-institutional connectivity in higher education is because of KNET. However, the lack of bandwidth access seriously constrains ICT use by faculty and students and, currently, the cost of bandwidth precludes a solution. As the "Gap Analysis" study[19] concluded, "the real problem is not the absence of programs in African universities but the inability of students to gain access to these programs."
Collaborating mechanisms	Kenya is well served. The Kenya ICT Trust Fund is a model to be copied in terms of a PPP to garner resources for ICT in education. The KEI is another institutional mechanism that facilitates collaboration and, in the NGO sector, the NICE umbrella provides a mechanism for co-ordination of differing and effective initiatives.	
Human resource capacity	Remedial initiatives are being taken but that will take time to develop. The Strategic Plan places a great deal of emphasis on the need for training.	The ICT plans of the ministry recognise a current deficit in terms of HR capacity to lead and support the implementation of the plan. Skill sets in the school system are very low. The need for training of school managers and teachers is widely recognised and is being addressed, but the challenge is huge and will take time. This constraint is much more pronounced at the primary level. In higher education the constraint is less acute with professors; however, very few students have had the opportunity to master information management skills because of the lack of access to infrastructure.
Fiscal resources	The existence of the strategic framework appears to be bringing	Currently lacking.

	forth both donors and the private sector to participate in the ICT Trust Foundation.	
Learning content	Digital content development is underway for the school curricula and, in a collaborative manner, among some of the universities (Avoir Project).	Currently there is not much available and there is a lack of access to that which is available. There is a need to develop content in local languages as well as English.
Procurement regulations		The duties and taxes currently levied on ICT products make them too expensive.
Attitudes	There is a strong belief that the incorporation of ICTs is essential at all education levels. This is shared from the political to the student level.	There is a perception that distance education is "second best."
Sustainability	The ministry recognises that the adoption of ICT needs to be based on an understanding of the total cost of ownership. Strategies for sustainability are being developed at local levels through community involvement and service provision.	The experience of projects failing once project funding is over is common giving rise to some cynicism.

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ICT in Education in Lesotho

by Shafika Isaacs
April 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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Overview

Despite its poor ICT infrastructure and high levels of poverty, Lesotho has begun to take the necessary steps to promote higher levels of ICT access and usage in its communities and education institutions. The Government of Lesotho has adopted a national ICT policy that makes some references to the education sector. Over the last two years, the NEPAD eSchools Demo Project in Lesotho has been a catalyst in focusing attention on the potential that ICTs hold to enhance education in the country.

Country Profile

Lesotho is a small, landlocked mountainous country with a small population, a low GNP per capita, and a high level of poverty. Lesotho's economy is based primarily on subsistence agriculture, livestock, and remittances from miners employed in South Africa (though this work has declined steadily over the past several years). A small manufacturing base depends largely on farm products that support the milling, canning, leather, and jute industries. Proceeds from membership in a common Customs union with South Africa and from the Lesotho Highlands Water Project (which controls, stores and redirects water to South Africa) form the majority of government revenue.

Table 1 provides a brief overview of basic socio-economic indicators for the country.[1,2]

Table 1: Socio-economic Indicators: Lesotho

Indicator	
Population	2 million (2006)
Languages	Official languages of Sesotho (southern Sotho) and English. Other languages: Phuthi, Xhosa, and Zulu
2005 Economic activity (% of GDP)	Agriculture: 17.5 Industry: 40.9 Services:41.5
Human Development Index (2004)	148 (out of 177 countries)
Gender Parity Index*	0.486 (2004)
Per capita gross national income (US dollars)	$590 (2003); $740 (2004); $960 (2005)

*GPI = gross enrolment ratio (GER) of females, divided by the GER of males and indicates the level of access by females to education compared to males. A GPI of 0.486 suggests there are very low levels of gender parity in Lesotho schools.

The Education System

The Lesotho education system includes integrated early childhood care and development (IECCD) which lasts three years, primary education which lasts seven years, junior secondary which lasts three years, senior secondary which lasts two years, and tertiary which lasts four years. There is also a parallel technical vocational diploma course (senior secondary + or three years TVET). This system operates within a unitary state with 10 administrative districts.

Table 2 below shows the numbers of institutions at each level.[3] The schools listed are largely those schools that are registered with the Ministry of Education and Training of Lesotho. There are also schools that are not registered with the ministry.

Table 2: Education Institutions, 2005

Level	No. of schools/centres
IECCD	622
Primary schools	1,477
Secondary schools	256
Skills training centres	21
Technical institutes	7
Polytechnics	1
Teacher-training colleges	1
Universities	1

For more than a century, the missionaries assumed responsibility for education in Lesotho, including organsising the schools, providing the curriculum, paying and professional supporting the teachers, and providing the facilities. Church halls were used as classrooms, and often teaching and learning were conducted in the open air. Even though the Government of Lesotho has been involved in education since the 1920s, sharing responsibility for its provision with the churches, much of the formal education system is still run by missions and is largely administered by the three largest churches – the Roman Catholic Church, the Lesotho Evangelical Church, and the Anglican Church of Lesotho – under the direction of the Ministry of Education.[4]

Primary education is free, but secondary and tertiary education is not. The latter two levels operate on a loan bursary scheme.

Lesotho's adult literacy rate stands at 82.2% (2004).

Challenges

Lesotho faces severe challenges. Approximately 25% of children do not attend school, particularly in rural areas where families involved in subsistence activities need the help

of their children to survive. The costs of school attendance, books, uniforms, and educational materials are unaffordable for many families especially those suffering family stress, poverty, the spread of HIV/AIDS, and divorce, all of which has also led to a rise in child homelessness and abandonment, creating growing numbers of street children. Boys are more affected by non-attendance than girls.

Lesotho's educators are also challenged by the lack of financial resources needed to meet the growing demand for well-educated local teachers, the need for literacy, and for vocational and technical training outside the formal academic setting. Attempts are being made to introduce more practical subjects to make education relevant.

HIV/AIDS has exacted a heavy toll on the education system. There are reportedly increasing numbers of orphaned and vulnerable children becoming heads of families, and boarding facilities are required for these school-going children. There has also been an increased demand for teacher supply because of teachers lost through the HIV/AIDs pandemic in addition to other causes of attrition such as retirement or transfers to other sectors.[5]

Infrastructure

Lesotho has a severely underdeveloped infrastructure. Table 3 provides an overview of the country's ICT infrastructure indicators.[6]

Table 3: ICT Infrastructure Indicators

Indicator	
Fixed lines	48,000 (2005)
Cellular	245,100 (2005)
Radio broadcast stations	AM 1, FM 2, shortwave 1 (1998)
Television broadcast stations	1 (2000)
Internet hosts	168 (2006)
Internet users	43,000 (2005)

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Approximately only 10 out of an estimated 1,477 primary schools have any form of rudimentary access to ICTs, and sometimes this is in the form of only one PC with no Internet access. Of the total number of schools (about 1,700) in Lesotho, only 20 have electricity. Some have solar panels which are used to power groundwater pumps.

ICT Policies

While Lesotho does not have an explicit independent national policy on ICTs in education, the government adopted a National ICT Policy in 2005 in which are embedded considerable references to and implications for the education sector. Lesotho also has an education strategy which mentions the role of ICTs.

The National ICT Policy highlights ICTs as tools to enable the country to achieve its development goals as articulated in the Lesotho Vision 2020 policy document and the Poverty Reduction Strategy paper. The policy also provides a brief stakeholder analysis and the roles that are expected in realising the policy goals. It identifies 10 catalysts in the implementation of the policy, which include education and human resource development as well as health, agriculture and food security, tourism, gender, and youth.

The policy's stated vision is "To create a knowledge-based society fully integrated in the global economy by 2020." This vision anticipates the successful development and deployment of ICTs by 2015 that will:

- Respond to national needs and priorities
- Reduce inequalities between the sexes and decrease the digital divide between urban and rural areas and the haves and have-nots
- Improve governance and deepen democracy
- Develop the human capacity needed to drive and sustain an information economy
- Support economic activities at home and throughout the world

Its mission is "To fully integrate information and communications technologies throughout all sectors of the economy in order to realise rapid, sustainable socio-economic development."

Some of the strategies include investing in ICT education and human resource development by:

- Requiring that ICT literacy and training programmes be available throughout the education system and within the public at large
- Growing the resource pool of ICT professionals with standardised skill sets and ensuring that appropriate incentives are in place to retain these workers
- Encouraging lifelong learning among the population at large and promoting on-the-job training and retraining within the public and private sectors
- Promoting electronic distance learning to maximise scarce resources and expand access to educational training and research

Education institutions also feature among the key stakeholders identified to play a role in realising the policy by improving teaching and learning mechanisms that promote ICT literacy and produce local ICT products and services. They should ensure that ICT literacy is part of the core curriculum and they must use ICTs to expand access to education as well as improving the quality of education.

The policy proposes investment in all levels of formal education and that policy efforts shall be directed at using ICTs to facilitate education and lifelong learning and to support efforts of the private sector in its delivery of on-the-job training and retraining programmes.

Some of the strategies to be considered include:

- Encouraging all educational institutions to invest in computers and to connect to the Internet
- Promoting electronic distance learning, training, and virtual learning systems to complement and supplement campus-based education and training systems
- Developing ICT curricula for all levels of the education system
- Encouraging collaboration between local and international educational institutions to facilitate educational exchange and promotion of ICT education and training
- Working with the private sector to create affordable packages and schemes under which students, teachers, and educational institutions can afford ICT products and services
- Using electronic educational management and information systems to improve the management of educational institutions
- Developing mechanisms to retain a large pool of ICT professionals to meet the needs of the country
- Establishing and enforcing standards for the certification of ICT professional skills
- Encouraging lifelong learning among the population at large and promoting on-the-job training and retraining within the public and private sectors
- Improving access to education to people with disabilities
- Encouraging public and private sector apprenticeship programmes, internships, co-ops, and work-study programmes

The policy states government's commitment to:

- Developing partnerships with stakeholders to facilitate the acquisition of ICTs for all education institutions
- Facilitating the provision of distance learning applications through ICTs to ensure academic and training programmes are available nationally
- Encouraging the National Library to be equipped with appropriate ICT tools and resources
- Integrating ICTs in mainstream educational curricula as well as other literacy programmes and providing for equitable access for students at all levels
- Developing special ICT training programmes for disabled persons, youth, and women
- Setting up mechanisms that promote collaboration between industry and training institutions to build appropriate human resources capacity
- Promoting twinning of training institutions in Lesotho with those outside the country to enhance skills transfer
- Working with private industry to establish initiatives and programmes aimed at improving and upgrading the technical skills of existing employees

Policy implementation

The Ministry of Education and Training is reportedly ahead of the rest of the public sector in Lesotho, particularly in implementing an effective education management and information system (EMIS). The EMIS also assumes the form of a geographic information system (GIS) in which all schools and education institutions have been

plotted by the ministry. The ministry also has a wireless area network (WAN), which connects to remote sites, and a local area network (LAN), which has been active for eight years. Every work station in the ministry has Internet access, and there is also a dedicated Web site[7] in addition to the Lesotho Government Web site.

Policy implementation in education includes a few initiatives in the form of pilot projects in the schooling and tertiary sectors

Current ICT Initiatives and Projects: Schools

Two key projects stand out in the school sector: the NEPAD eSchools Demo Project and SchoolNet Lesotho. There are also reportedly a few private sector companies engaged independently in making some technology accessible to schools at a price on the basis of leasing the PCs for rental to schools.

NEPAD eSchools Demo Project
The New Partnership for Africa's Development (NEPAD) eSchools Initiative is a multi-country, multi-stakeholder, continental initiative that aims to impart ICT skills to young Africans in primary and secondary schools and improve the provision of education in schools through ICT applications and the use of the Internet.

The first phase of the initiative is a demonstration (demo) project that is being implemented by the private sector partners. The objectives of the Demo Project are to:

- Determine typical e-school scenarios and requirements in various circumstances in Africa
- Highlight the challenges inherent in a large-scale implementation of e-school programmes
- Monitor the effectiveness of multi-country, multi-stakeholder partnerships
- Determine best practice and exemplary working models for the large-scale implementation of the initiative, which aims to equip more than 550,000 African schools with ICTs and connect them to the Internet
- Demonstrate the costs, benefits, appropriateness, and challenges of a satellite-based network
- Demonstrate the costs, benefits, and challenges of ICT use in African schools

Lesotho is one of the 16 countries where the Demo Project was co-ordinated by a dedicated country liaison person based at the Ministry of Education and Training. Oracle and Microsoft are two companies that formed consortia to support the Demo Project in six Lesotho high schools where the typical model involved fitting each school with a lab comprising approximately 20 PCs, a server and printer, and a media lab which in some instances included a PC-based kiosk containing health information and satellite television access to education channels. Teachers at the six schools received training and learners have subsequently used the PC labs in the classroom.

The Demo Project was launched by the prime minister of Lesotho, which gave the project significant prominence. The success of the NEPAD eSchools Demo Project in Lesotho is attributed to the support and buy-in at the highest level. The project has reportedly influenced thinking among policymakers in Lesotho and has created huge demand.[8]

SchoolNet Lesotho
SchoolNet is a registered NGO in Lesotho. Its history dates back to 1999 when it operated as a project from the National University of Lesotho. Its role is to promote learning and teaching through ICTs to schools in Lesotho. SchoolNet Lesotho held launch workshop in 2005 with the support of the Open Society Initiative for Southern Africa (OSISA). It is run largely as an organisation of volunteers and is dependent on donor funds.

Current ICT Initiatives and Projects: Higher education

Lesotho has three main institutions of higher learning: the National University of Lesotho (NULS), the Lesotho College of Education, and Lerotholi Polytechnic.

The National University of Lesotho was the base for attempts at establishing ICT initiatives. For instance, a Technology Enhanced Learning Initiative of Southern Africa was established in the form of a telecentre at the Institute for Extra Mural Studies based at NULS, although this is project is no longer functional.

In general, NULS does not have ICT facilities to support integration into learning and teaching for its students.

Current ICT Initiatives and Projects: TVET, ABET, and Informal

The Ministry of Education and Training has a Technical and Vocational Department that is the governing regulatory body that aims to improve the quality of technical and vocational training. To date there have been no significant projects and programmes incorporating the use of ICTs. However, the semi-autonomous Lesotho Skills Agency (LSA) and the National Training Fund will raise sufficient funds to support high-quality training, allocate funds to support national and sectoral skill priorities, and promote the delivery of quality and market relevant training.

CECS
The Community Education Computer Society (CECS) is a South African-based NGO which focuses on the development of ICT skills in the form of literacy programmes across southern Africa. Lesotho is one of six countries where CECS has a dedicated ICT literacy programme that was established with the support of the Open Society Initiative for Southern Africa (OSISA).

The 80-hour programme on ICT literacy enables participants to use word processing, spreadsheet and presentation software, design a basic Web page using HTML, and perform basic computer troubleshooting and maintenance.

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in Lesotho in terms of enabling or constraining features in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation	Lesotho has a national ICT policy that incorporates the education sector.	
Advocacy leadership	Departments and individuals within the Ministry of Education and Training are actively pursuing strategies and projects to support the implementation of the national policy, particularly in the aftermath of the NEPAD eSchools Demo Project success.	
Gender equity	National ICT policy recognises explicitly the role ICTs can play in promoting gender equality and women's empowerment.	
Infrastructure and access		The lack of national infrastructure seriously constrains the use of ICTs in Lesotho's education institutions.
Collaborating mechanisms		While there are attempts at collaboration between Ministries of Education and other ministries, the private sector and civil society institutions, there are no explicit collaborating mechanisms in place.
Human resource capacity		There remains a very limited layer of skilled personnel and champions within ministries to drive the national policy implementation, and often

		consultants and groups from South Africa are drawn in to support projects and programmes.
Fiscal resources		Currently lacking
Learning content		Local contextually relevant learning content is currently lacking although there are attempts by the ministry to address this.
Procurement regulations		The duties and taxes currently levied on ICT products makes them too expensive.
Attitudes	Since the launch of the NEPAD eSchools Demo Project, attitudes have been more supportive of ICTs in education.	

Notes

1 Estimates for this country explicitly take into account the effects of excess mortality due to AIDS; this can result in lower life expectancy, higher infant mortality and death rates, lower population and growth rates, and changes in the distribution of population by age and sex than would otherwise be expected (July 2006 est.) https://www.cia.gov/cia/publications/factbook/geos/lt.html
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7 www.education.gov.ls
8 Interview with Lesotho Ministry of Education and Training representative.

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ICT in Education in Liberia

by Kofi Mangesi
May 2007

Source: *World Fact Book*[1]

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Overview

Liberia is in the process of developing a comprehensive ICT policy called E-Liberia: Vision 2010, yet efforts at increasing access and use of ICTs have already begun under the telecommunication policy. In the education sector, Liberia has no specific policy on ICTs, but there is wide acknowledgement that ICTs need to be incorporated in schools and universities.

Country Profile

Freed US slaves established Liberia in the 19th century as Africa's first independent country effective July 26, 1847. After nine years of misrule and decline, several rebel factions (including one led by Charles Taylor) mounted an uprising against President Doe, beginning an eight-year civil war that devastated the population. A peace agreement, brokered by the Economic Community of West African States (ECOWAS), ended the fighting in 1997 with a round of presidential elections

During the presidential elections on October 11, 2005, and November 8, 2005, Ellen Johnson Sirleaf became Liberia's – and Africa's – first elected female head of state.

Liberia's legislature is a bicameral National Assembly consisting of a Senate (26 seats) and a House of Representatives (64 seats). Members of both institutions are elected for nine- and six-year terms respectively by popular vote.

Historically, Liberia's economy has been predominantly commodities based. Prior to the war, the rubber industry generated over USD$100 million export earnings annually. The discovery of significant iron ore deposits attracted substantial foreign investment in the 1960s and 1970s, with the export-oriented concession sector as a whole generating about one-third of government revenue

Limited available information suggests that in recent years there has been a modest rebound in economic activity, largely driven by donor assistance (predominantly humanitarian aid).

Table 1 provides a quantitative perspective of some selected system indicators.[2,3]

Table 1: Selected Country Data

Indicator	
Population	3.3 million
Languages	English
Economic activity 2005 (% of GDP)	Agriculture: 63.6% Industry: 15.2%

	Services: 21.1%
Per capita gross national income (US dollars)	$130 (2000); $120 (2004); $1,300 (2005)

The Education System[4]

Elementary education in Liberia lasts for six years. Secondary education consists of two three-year cycles: three years of junior secondary (Grades 7 to 9) and three years of senior secondary education (Grades 10 to 12). At the end of Grade 10, students sit for an examination administered by the West African Examination Council (WAEC). Successful students are eligible to enter senior high school. Upper secondary education culminates in the WAEC Certificate Examination, which is the basis for access to higher education institutions. An entrance examination is also required for access to higher education.

Higher education is provided by universities, colleges of education, business schools, and polytechnics, as well as institutions that offer professional courses such as bookkeeping and accounting, architecture, law, medicine, and mass communication. Universities train high-level manpower in various fields.

The University of Liberia is responsible for research, but this role has been hampered by the serious damage inflicted on the university by the civil war: over 90% of its facilities were looted or destroyed, many faculty members fled to other countries, and student enrolment dropped. The Cuttington University College has now reopened.

Each tertiary education institution is under the Ministry of Education, the National Commission on Higher Education, and the Board of Trustees, but each sets its own standards.

Table 2 provides a quantitative perspective of some selected system indicators.[2]

Table 2: Selected Education Data

Primary enrolment (% gross)*	99.2 (2000)
Secondary enrolment (% gross)*	33.2 (2000)
Tertiary enrolment (%gross)*	15.5 (2000)
Ratio of girls to boys in primary and Secondary (%)**	72.7 (2000)

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**Ratio of girls to boys is the percentage of girls to boys enrolled at primary and secondary levels in public and private schools.

ICT Policy

National

Liberia is in the process of preparing its national ICTs policy, E-Liberia: Vision 2010. However a finalised telecommunications policy under the Telecommunications Act 2006[5] provides insights into the ICT vision for the country. This policy establishes the framework for the evolution of the Liberian telecommunications sector and the transformation of Liberia towards an information-based economy and society.

The objectives of the telecommunications policy are the following:

- To promote the development of the Liberian telecommunications infrastructure and markets
- To promote market liberalisation, private-sector expansion, and fair and effective competition throughout the telecommunications sector
- To create and establish an independent regulatory agency responsible for telecommunications and spectrum regulation
- To promote universal access to telecommunications services throughout Liberia
- To support education, economic, and social development within Liberia
- To ensure flexibility and adaptability and ease of access to radio spectrum resources in response to technological advances, and economic, social, and markets factors.

The Ministry of Post and Telecommunications (MPT) is responsible for determining broad sector policy and development strategy to conform with the goals and laws of the Government of Liberia.

Education sector

Liberia has yet to develop any comprehensive ICT strategy for the education sector, although the proposed Telecommunications Act specifically makes provisions for ICTs in education. The policy states, "The educational system, from primary through university curriculum, shall incorporate awareness and applications of ICTs, to prepare students to participate fully in the information age."[5]

It goes on to say, "The Government will promote universal access or community access especially in primary and secondary schools and universities, community health facilities and hospitals, telecenters and any other public or private community centers."[5]

Infrastructure

National

The Liberia telecommunications sector, like most other infrastructure, has been severely hit by the civil war. Copper wires have been looted and there is very little telecommunications service outside the capital Monrovia. However progress is being made and the existing telecom operators are busy expanding their infrastructure to other parts of the country.

Also several private sector initiatives have lead to an expanding use of computers and Internet cafés in the major cities, especially Monrovia.

Table 3 provides a snapshot of the state of national ICT infrastructure.[6]

Table 3: ICT in Liberia

Indicators	
Fixed-line operators	1
Cellular mobile operators	4
Total cellular mobile subscribers	200,000
Internet users per 1,000 inhabitants	1 (2004)

Education

Efforts at rebuilding the education infrastructure in Liberia have included increasing access to ICTs in schools and universities. A pilot computer project under which computer laboratories were established in seven public high schools in seven of the political subdivisions has been launched. The goal of this programme is to make computer education an integral part of public school education curriculum in all counties.

At the tertiary level (Cuttington University and University of Liberia), there is also a dire need for information technology including the Internet, CD-Roms, and Web-ready computers.

Current ICT Initiatives and Projects

Table 4 summarises the current and recent ICT initiatives and projects in Liberia.

Table 4: ICT Initiatives and Projects

Project: From Guns to Computers: ICT multimedia and skill training centre for child ex-combatants • *Organisation(s)/funding sources:* Education for Peace in Africa and SchoolNet Africa • *Contact:* www.schoolnetafrica.net/278.0.html
Project: ICT Training for Young Refugees in Liberia: enables development of an efficient and sustainable education in ICT, including the Internet • *Organisation(s)/funding sources:* UNHCR; funded by International Telecommunication Organisation • *Contact:* www.itu.int/ITU-D/CDS/newslog/rss_bdt_newslog.asp
Project: GATech Project: improving ICT training and infrastructure in the University of Liberia • *Organisation(s)/funding sources:* Georgia Technology and University of Liberia; funded by Georgia technology (USA) • *Contact:* www-static.cc.gatech.edu/~mikeb/Liberia/liberia.indx.htm
Project: Hoffman Technology Centers; 14 public access computers for use at no charge • *Organisation(s)/funding sources:* Monrovia Public Library • *Contact:* http://nhanced.net/sites/site15/index.cfm?page=page&id=989&pageid=142

Project: Digital Bridge Project: A multi-media laboratory installed at the University of Liberia that includes 200 computers linked to a university intranet, research data bases and a VSAT internet connection that allows students to register for courses, pay fees and access libraries globally. (http://allafrica.com/stories/200705020639.html) • *Organisations:* SocketWorks, a software and outsourcing company that provides packaged ICT solutions to clients; University of Liberia; WorldSpace. • *Contact:* Damilola Bamiro (dbamiro@socketworksglobal.com); K.Riva Levinson (Riva@krinternational.com)

Implementing ICT in Education: What Helps and What Hinders?

Table 5 provides the various factors that help and hinder ICTs and education growth in Liberia.

Table 5: Analysis of Factors Influencing ICT Adoption

Factors	Enabling Features	Constraints
Policy framework and implementation plans	A commitment to policy development	Lack of a clear, present strategy for ICTs in education
Advocacy leadership	Strong leadership on ICTs and education from the Minister for Vocational Education	
Gender equity	Presidential support for girls' education	
Infrastructure and access	A serious commitment for infrastructure development in the education sector by government, donors and private sector	unreliable electricity
Human resource capacity		A huge skills gap in meeting the ICT needs of the education sector
Fiscal resources	A large expected inflow of donor and multilateral support for Liberia's reconstruction	
Learning content		No learning content on ICTs currently exist in schools
Attitudes	A firm belief that the education sector is the key to the reconstruction of Liberia	
Sustainability		A high reliance on donor and philanthropic funding

Notes

1. The World Factbook 2007. https://cia.gov/cia//publications/factbook/geos/li.html

2. Country Brief: Rwanda. 2006. World Bank. http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/AFRICAEXT/LIBERIAEXTN/0,,menuPK:356204~pagePK:141132~piPK:141107~theSitePK:356194,00.html

3. "Beyond Scarcity: Power, Poverty and the Global Water Crisis." Human Development Report 2006. UNDP. http://hdr-beta.undp.org/hdr2006/statistics/countries/data_sheets/cty_ds_LBR.html

4. Liberia Education System. IAU World Higher Education Database. 2003-2004. www.unesco.org/iau/onlinedatabases/systems_data/lr.rtf

5. Republic of Liberia national Telecom Policy and Strategy. http://www.jhellerstein.com/liberiatelecompolicy.pdf

6. ICT at a Glance. World Bank. 2005. http://devdata.worldbank.org/ict/lbr_ict.pdf

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ICT in Education in Libya

by Amr Hamdy
June 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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Overview

Libya boasts the highest literacy rate in the Arab world, and the UN's Human Development Index, which ranks standard of living, social security, health care and other factors for development, places Libya at the top of all African countries. Government reform plans in developing ICT infrastructure in Libya and incorporating ICT in education as key components in its overall development plans. Libya has intentions to be seen taking a leadership role on the African continent through sponsorship of major initiatives and projects, including those in the neighboring countries of Chad, Niger, and Rwanda. That said, the challenges of poor existing infrastructure and a lack of skilled and ICT-equipped teachers is a great challenge to the current reform process.

Country Profile

Libya, one of the largest countries by area in Africa, is situated in North Africa, with long borders on the Mediterranean Sea where the majority of the population lives. The vast portion of the country covered by the Sahara Desert is hardly inhabited.

Table 1 provides some selected socio-economic indicators for the country.[2]

Table 1: Socio-economic Indicators: Libya

Indicator	
Religions	Sunni Muslim 97%; other 3%
Languages	Arabic, Italian, English. All are widely understood in the major cities.
Population	5.9 million (includes 166,510 non-nationals) (2006 est.)
Population growth rate	2.3% (2006 est.)
Literacy	Male: 92.4% Female: 72% Total population: 82.6% (2003 est.)
GDP (US dollars)	$34.83 billion (2006 est.)
GDP per capita (US dollars)	$12,700 (2006 est.)
Labour force	1.787 million (2006 est.)

The Education System

Education in Libya is free to everyone from elementary school right up to university and post-graduate study, at home or abroad. Schools are positioned throughout the country. The policy is to reach out even to the nomadic hard-to-reach areas, and mobile classrooms were introduced to cover all of Libya.

Libya's population of approximately 5.9 million includes 1.7 million students, over 270,000 of whom study at the tertiary level, including those in the higher-technical and vocational sector.[3] This number is an increase of over 200,000 from the level of 1975, when just over 13,000 were enrolled.

Pre-university schooling is divided into three sections: primary, preparatory, and secondary.

The first nine years of education are compulsory and are known as basic education, which consists of six years of primary school and the first three years of secondary school. Primary education covers six years divided into a four-year period and a two-year period, and secondary education covers six to seven years divided into a three-year cycle (compulsory) and a three- to four-year intermediate cycle.

The basic level allows students who drop out before completing the full nine years of the opportunity to enroll in vocational programmes of one to three years in length. Intermediate vocational training centres train students for various skills-based professions. Vocational schools offer programmes for 44 different vocations in seven major fields.

Higher education in Libya is provided by universities (both general and specialised) and higher technical and vocational institutions. The higher education system is financed by, and under the authority of, the state. The Open University is the only institution within the public sector that relies to some extent on tuition fees paid by students. Policymakers have in recent years allowed the establishment of private institutions of higher education through what are known as educational co-operatives (Tasharukiat Talimia). There has also been considerable research into the possibility of developing partnerships between the public (shabiat) and private sectors to finance higher education, which, in a three-year period between 1997 and 2000, resulted in the establishment of more than five private university colleges and higher education institutes.

Education is free up to university level. Post-graduate studies are not free but are subsidised. For example, the whole cost of a master's degree course at the Academy of Postgraduate Studies may cost around 3,000 Libyan dinars or about USD$2,300 for three years.

Table 2 provides a quantitative perspective of some selected system indicators.[4]

Table 2: Selected Education Data

Indicator	Total
Public schools	4,000
Private schools	255
Technical	1,066
International	15
Kindergartens and nurseries for pre-school children	1,250

Elementary students	838,395
Preparatory students	273,391
Secondary students	120,000
Specialist secondary schools	280,000
Public universities	27
Private universities	56
Private institutes	255
Technical	50 (approx.)
International	10 (approx.)
University students	246,000

ICT Policies

The national policy for ICT in education was launched in 2005 and is mainly managed by the Ministry of Education and the Ministry of Vocational Training with the participation and support of other parties such as the General Postal and Telecommunication Company and Libya Telecom and Technology. The policy in general aims at enabling access to the ICT through the provision of computers and the Internet. This is planned for the short term and there are some signs that the policy is being followed up and implemented.

The door has been opened for public-private partnerships especially since the embargos against Libya have ended. There is a huge scope for co-operation between the government and the private sector, as Libya is still new to technology in terms of its ability to run large-scale ICT programmes. The government is determined to provide tools and ICT skills on a large scale to all sectors of the country. The UNDP is playing a vital role in laying the groundwork for the ICT policy implementation.

The policy is in its early stages. However the main aim is to improve the quality of education through ICT by:

- Adopting modern techniques and methods in education
- Encouraging the scientific community to engage in research within the community
- Encouraging the private sector to get involved in funding higher and specialist education
- Developing open and distance learning as well as continued education
- Encouraging higher education

Each ministry is in charge of its designated sector of education (i.e., general education, higher education, and vocational education with training). The highest authority they all report to is the General People's Committee. The ministries also co-operate with each other in matters that are linked to one another.

Infrastructure

Libya has moved from having virtually no lines after its revolution in the early 1960s, to having one in every 10 of its four million inhabitants now having telephone access. The telephone system is 90% digital and is expected to be fully digitised by the end of the year. In Tobruq, Naidoo opened a new digital telephone exchange, watched by many hundreds of local citizens. A Siemens digital switch will add a further 8,000 lines to the country's rapidly growing telecommunications infrastructure.

The telecommunications operator is the General Posts and Telecommunications Company (GTPC) and there is also a cellular service based on the GSM standard, which is managed by Ericcson and Orbit Telecom for GPTC.

The Centre National de l'Information et de la Documentation is the main networking agency in the country. The Post and Telecom operates an Internet hub in Tripoli with a 2MB International link via Teleglobe in Canada. Dial-up and leased-line facilities are available via Libya Telecom and Technology.

Table 3 provides a snapshot of the state of national ICT infrastructure in the country. Table 4 summarises the computer penetration.

Table 3: ICT in Libya[5]

Indicator	
Telephones - main lines in use	750,000 (2003)
Telephones - mobile cellular	234,800 (2004)
Radio broadcast stations	AM 16; FM 3; shortwave 3 (2002)
Television broadcast stations	12 (plus 1 repeater) (1999)
Internet users	205,000 (2005)
Cities with internet POPs	1
Internet hosts	2
Internet access providers	1

Table 4: Computer Penetration in Libya

Indicator	
Home computers	3.16%
Primary schools	5%
Secondary schools	50%
Universities	100%

Current ICT Initiatives and Projects

Table 5 summarises the current and recent ICT initiatives and projects in Libya.

Table 5: ICT Initiatives and Projects

Programme	Description
Capacity-building Projects	
Capacity-building, post-graduate studies	In late 2006, 200 post-graduate students were sent to the UK to do an intensive one-year course in modern management techniques and management within the education system in Libya. *Partners/donors:* Ministry of Vocational Training
Capacity-building and teacher training	There is a programme for the training of teachers and staff on ICT and ICT for education which is a governmental initiative. *Partners/donors:* The Libyan General Company for Postal Services and Telecommunications owns and operates Libyan Telecom and Technology (LTT) which offers Internet access
National ICT project for capacity-building	The project activities will include the establishment of Local Area Networks (LANs) within all 149 faculties belonging to various university campuses and institutes, and of a Wide Area Network (WAN) forming the Libyan Higher Education and Research Network (LHERN). It also foresees the creation of digital libraries/portals of educational resources, the development of ICT-enhanced learning solutions (e.g., e-learning, tele-education, tele-medicine). An important component of the project is the training of faculty (digital literacy, basic ICT skills, advanced teacher training on using ICTs in teaching and courseware development) and staff (system administrators, media centre specialists, etc.). In addition, the project foresees the creation of a national ICT resource centre for educators and the automation of university management systems through ICTs (e.g., student information systems, university procedures, financial operations, etc.). *Partners/donors:* UNESCO and the government[6]
Infrastructure Projects	
The National Initiative for the Introduction of Computers	This initiative aims at importing and installing 3,400 computer laboratories at all elementary and primary schools at the estimated cost of 121 million Libyan dinars (about USD$95 million). This is an effort of the General People's Committee (Ministry of Education) to develop and modernise the educational system in Libya. *Partners/donors:* General People's Committee (Ministry of Education)
Model schools	About 400 model schools nationwide are going to be set up to offer modern and up-to-date courses as well as being equipped with the latest technologies and learning facilities.
Development of inexpensive educational laptop support	One Laptop Per Child (OLPC), a non-profit US group, has the goal of supplying machines to all 1.2 million Libyan school children by June 2008. Libya will receive 1.2 million computers, one server per school, and a team of technical advisors to help set up the system, satellite Internet service, and other infrastructure. The country will invest USD$250 million in the project. *Partners/donors:* The government and OLPC[7]
e-Learning Projects	
The Open University	The Open University was introduced in 1990 and offers distance education courses. Its main centre is in Tripoli, with 16 other branches located around the country. Curricula and teaching

	programmes are conveyed via written and audiovisual learning packages.

Implementing ICT in Education: What Helps and What Hinders?

Table 6 provides a summary of the current stage of ICT development in Libya in terms of enabling or constraining features in the education system.

Table 6: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation plan	A national ICT policy for education was launched in 2005. The policy aims at providing access to ICT tools and building a strong infrastructure. The policy also encourages research and development.	The implementation of the ICT policy is still at the early stages, as is access to ICT tools. Collaboration of all government entities, the private sector, and the donor community is required to achieve the set policy and ensure proper implementation and provision of access for all.
Advocacy and leadership	The leadership in the Jamahiriya headed by Col. Qaddafi is determined to build a strong society capable of competing in the global arena. Implementation of the national ICT policy in education is directly monitored by the Ministry of Education and Ministry of Vocational training.	Libya has faced a number of constraints and challenges especially during the embargo (which ended in 2006).
Collaborating mechanism	Different government agencies and the local and foreign private sector are collaborating to achieve socio-economic development through the implementation of the national ICT policy. UNDP and UNESCO work hand in hand with government agencies to ensure proper and timely implementation of the ICT strategy. This support also opens the door for the donor community and encourages investment in Libya.	Libya still lags behind in terms of usage of ICT tools, infrastructure and access. The process of implementing the national ICT policy in particular and development projects in different domains in general are still at an early stage.
Human resources	One of the main objectives of the national ICT policy for education	There is a lack of well-qualified and trained teachers, required for

	is human resource development. Investment in human resources is key to achieving the goals and objectives of the national ICT strategy.	building a generation of technically qualified students. In addition, there is a great deal of apathy among teachers due to their low salaries.
Rural/urban divide	The target is to provide education to all children and provide outreach to all areas of Libya. To overcome the constraint of the extended areas in the Sahara, mobile schools were introduced to provide access to education for nomadic, hard-to-reach parts of the country.	
Gender equality	A statement by Col. Qaddafi demonstrates the commitment to provide services, especially in the area of capacity-building and education, with no differentiation between genders. In fact, currently there are more females than males in the schools, and they record higher performances levels.	
Learning material	An objective of the national policy in education is research and development to ensure the provision of proper learning materials and tools. Provision of new methods and media for learning is also of concern.	Educational materials are available free up to secondary schooling, but the quality of learning material and curricula needs revamping to meet with latest technological developments and to set the grounds for building a generation capable of being active contributors to the development of Libya.
Sustainability	The lifting of the embargos has set the stage for stable sustainable development in Libya. The government remains focused on achieving growth at all levels. The national ICT policy is administered and supervised by relevant government officials with support and guidance of different UN agencies.	

Notes

1 The World Factbook 2007. https://www.cia.gov/cia/publications/factbook/geos/ly.html
2 Ibid.
3 Clark, N. Education in Libya. 2004. World Education Services (WES). http://www.wes.org/ewenr/PF/04Jul/PFPractical.htm
4 Libya Education.Encyclopedia of the Nations. http://www.nationsencyclopedia.com/Africa/Libya-EDUCATION.html
5 The World Factbook 2007. https://www.cia.gov/cia/publications/factbook/geos/ly.html
6 Multimedia Community Centres. UNESCO. http://portal.unesco.org/ci/en/ev.php URL_ID=20789&URL_DO=DO_TOPIC&URL_SECTION=201.html
7 Qaddafi's Computer Kids. http://www.checkpoint-elearning.com/article/3334.html

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ICT in Education in Madagascar

by Shafika Isaacs

April 2007

Source: *World Fact Book*[1]

Please note:

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Overview

Madagascar has begun to take steps towards promoting ICTs for development with the adoption of two policies: 1) the national ICT policy in 2004 and 2) the economic and social development policy, the Madagascar Action Plan for 2007-2012, which promotes the expansion of ICT infrastructure and access in the country including the establishment of ICT centres in schools. The country does not have a national ICT policy for education, and the level of access to ICTs including connectivity is relatively low. There are a few initiatives in the country that attempt to promote the access and use of ICTs to support learning and teaching, but these largely assume the form of extracurricular projects.

Country Profile

Since the mid-1990s Madagascar has followed a World Bank and IMF-led policy of privatisation and liberalisation which has placed the country on a slow and steady growth path. Agriculture, including fishing and forestry, is a mainstay of the economy, accounting for more than one-quarter of the GDP and employing 80% of the population. Exports of apparel have boomed in recent years primarily due to duty-free access to the US. Deforestation and erosion, aggravated by the use of firewood as the primary source of fuel, are serious concerns. Madagascar is plagued by periodic cyclones, floods, drought, and locust infestation. Poverty reduction and combating corruption will be the centrepieces of economic policy for the next few years.
Madagascar is a classified as a highly indebted poor country by the World Bank. Children make up more than half of the population, and half of them live on less than USD$1 a day.[2]

Table 1 provides some selected socio-economic indicators for Madagascar.[3,4]

Table 1: Socio-economic Indicators: Madagascar

Indicator	
Population	18.6 million (2005)
Languages	Official languages: French and Malagasy. National languages: Comorian, Antankarana, Southern Malagasy and Tsimehety.
2005 Economic activity (% of GDP)	Agriculture: 28.1% Industry: 15.9% Services: 56.0%
Human Development Index	143 (out of 177 countries) (2004)
Per capita gross national income (US dollars)	$240 (2000); $290 (2004); $290 (2005)

The Education System

Education in Madagascar is compulsory for children between the ages of six and 14. Primary schooling runs for five years. Secondary education for seven years and is divided into two parts: a junior secondary level of four years and a senior secondary level of three years. A vocational secondary school system, the collège professionelle (professional college), is the equivalent of the junior secondary level; the collège technique (technical college) is the equivalent of the senior level.[5]

The University of Madagascar is the main institute of higher education. It maintains six separate, independent branches in Antananarivo, Antsiranana, Fianarantsoa, Toamasina, Toliara, and Mahajanga. The university system consists of several faculties, including law and economics, sciences, and letters and human sciences, and numerous schools that specialise in public administration, management, medicine, social welfare, public works, and agronomy.

Official reports have criticised the excessive number of students at the universities. In 2006 the total student population at the six public universities was 37,152 when it reportedly had the collective capacity to manage 26,000 students. Reform measures have been under way to improve the success rate of students since only 10% complete their programmes taking an average of eight to 10 years to obtain a degree compared with five years for other African countries.

Table 2 provides a quantitative perspective of some selected system indicators.[6]

Table 2: Selected Education Data

Indicator	
Enrolment in primary education (% gross)*	134 (2004)
Transition to secondary	55 (2003)
Enrolment in tertiary education (% gross)*	3 (2004)
Gender Parity Index (GPI)**	0.96 in primary; 0.90 at university (2004)

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**GPI = gross enrolment ratio (GER) of females, divided by the GER of males and indicates the level of access by females to education compared to males. These GPIs (0.96 and 0.90) indicate that Madagascar is slightly below parity.

Over the past decade, the number of private tertiary institutions has grown. Most provide training in business, languages, management, and computer science. In 2005 the 50 recognised private higher institutions had 6,778 students (19.5% of the total).

The Malagasy government introduced a national plan to reach Education for All in 2003. Since then progress has been made with the total number of pupils in primary education increasing from 1.7 million during the 1997-98 school year to 3.7 million in 2005-06 school year. However, the challenge of improving retention rates remains. The percentage of young people age 11 to 14 years who attend secondary school is only 27%, which is among the lowest ranking in the world, even lower than the average of sub-Saharan Africa.

The rate of tertiary education enrolment is 3% which is lower than the average of 8% for sub-Saharan African countries. Madagascar also has high levels of illiteracy. In 2006 approximately 48% of the population of 15 years old and above were illiterate, and more than one million young people from 11 to 17 years were illiterate.[7]

Infrastructure

According to the World Economic Forum *Global Information Technology Report*, Mozambique ranks 102nd out of 115 economies using the networked readiness index (NRI) which measures the degree of preparation of a nation or community to participate in and benefit from ICT developments.[8]

Table 3 provides a snapshot of the state of national ICT infrastructure in Madagascar. [9]

Table 3: ICT in Madagascar

Indicator	
Fixed-line subscribers (2004)	58.7 per 1,000 persons
Mobile subscribers (2004)	334 per 1,000 persons
Dial-up subscribers	10.5 per 1,000 persons
Broadband subscribers (2004)	0
Internet users (2004)	90 per 1,000 persons
Television broadcast stations	1 (2001)
Radio stations	AM 2; FM 9 (2001)

New legislation passed in 1996 that envisaged full liberalisation of the telecommunications sector, including a second national operator. From 2003 to 2005 there was strong growth in the number of users of fixed and mobile telephones, expansion of the telecommunications network, and significant growth in the use of the Internet and access to financial postal services. Nevertheless, the nation needs reliable international connections at an affordable price to develop the economy and achieve regional integration. In 2005 only 8% of communes were connected by telephone and Internet services. Moreover, the majority of those connections were via satellite with inadequate capacity and high costs. Also in 2005, only 23% of communes had access to television and 39% were covered by the mail service.

ICT Policies

Madagascar Action Plan 2007-2012[10]

The Malagasy government has adopted the Madagascar Action Plan (MAP) for 2007 to 2012 which provides a set of eight commitments relating to the economic and social upliftment of Malagasy society:

- Commitment 1: Responsible governance
- Commitment 2: Connected infrastructure
- Commitment 3 Educational transformation
- Commitment 4: Rural development and green revolution
- Commitment 5: Health, family planning, and the fight against HIV/AIDS
- Commitment 6: High-growth economy
- Commitment 7: Cherish the environment
- Commitment 8: National solidarity

The commitment to connected infrastructure includes ensuring all urban and rural areas will be covered by a reliable, accessible, affordable communication system; information will flow to the regions through better access to radio and TV services, and partnerships with the private sector to provide new and better infrastructure will be promoted. The strategies to reach these goals include:

- Reducing the high cost of mobile phone and international calls
- Increasing competition between mobile operators
- Developing wider access to ICTs
- Implementing a national information technology action plan
- Expanding phone coverage throughout the nation
- Expanding postal coverage throughout the nation, including financial services
- Improving TV and radio media coverage

The priority projects to give effect to these strategies are as follows:

- Connect Madagascar to an international optical fibre network
- Develop access to telecommunications services including ICT and Internet
- Set up a national backbone system that includes a fibre optic network associated with major infrastructure projects (e.g., roads)
- Create new ICT centres in each region (technopoles)
- Improve the system of distribution and the flow of dispatching of postal services
- Modernise the radio and television infrastructure and services based on new technologies
- Liberalise the telecommunication sector
- Implement voice-over IP for all
- Replace the national regulator OMERT by a new regulator ARTEC

The Ministry of Telecommunications has been given the responsibility to lead theses projects.

One of the education challenges highlighted in the MAP is the challenge to improve upper secondary, technical, and vocational education. The strategies to meet this challenge include transforming the curricula to integrate new subjects: ITC, economy, communications, languages, and sciences with the creation of ICT centres in the schools as a stated priority project.

National ICT Policy[11]

The national ICT policy was developed by the Ministry of Telecommunications, Posts and Communication in collaboration with the United Nations Development Programme (UNDP). The integration of Madagascar into the globalisation process is stated as one of the government's priorities. The vision of the policy is for Madagascar to become a leader in providing high-quality ICT services, which will accelerate the country's economic, social, and cultural development. The strategic areas are infrastructure development, promoting content development and applications, capacity-building, and reviewing the institutional arrangements framework.

The policy identifies health and education as key sectors. It further identifies the necessity to produce ICT specialists and adjust the education system to meet the requirements of the new generation that utilises ICT facilities. It also proposes to introduce ICTs in all aspects of education and training.

The overall objective in the education sector is to establish an education system suitable for ICT development and innovation in pedagogy. This system facilitates the integration of new generations into the information society. Therefore, the policy proposes the incorporation of ICTs into the country's national curriculum framework and promotes the notion of continuous training in ICTs as a tool for education at all social levels.

Current ICT Initiatives and Projects

AVU Teacher Education Project[12]

The African Virtual University (AVU) established an ambitious teacher education project involving 10 African countries in partnership with African Development Bank (AfDB) and the New Partnership for Africa's Development (NEPAD) in 2006. Madagascar is one of the 10 countries involved.

The programme focuses on mathematics and science education and the integration of ICTs in and across the teaching of the curricula in these two subject areas. The intention is to contribute to the growth of more and better quality teachers through the use of flexible, open, distance, and e-learning (ODeL) methodologies at an affordable cost for diploma, undergraduate, and graduate levels.

The specific objectives of the project are to enhance the capacity of teachers in the use of ICTs in teaching and learning mathematics and science, to develop the capacity of teachers to deliver ICTs as a subject in secondary education, and to increase the number

of mathematics and science teachers by expanding access to training through the ODeL methods.

The project has set targets of developing 56 ODeL modules by early 2007, the content of which will be available in Portuguese, French, and English. The authors are drawn from 12 institutions in the 10 countries that the AfDB and UNDP funding covers. The Université d'Antananarivo in Madagascar is one of these 12 institutions.

Centre d'Information et de Documentation Scientifique et Technique (CIDST)
CIDST is a national research networking agency in Madagascar that works with various government ministries in establishing sectoral networks to facilitate information exchange.[13]

ICT Village
The ICT Village is an attempt at developing an integrated model on ICTs for sustainable development and poverty eradication involving a host of international organisations such as the FAO, IFA, ITU, UNDP, UNESCO, UNDESA, and the World Bank. The model considers the use of ICTs in producing clean energy and safe water.

The first ICT Village in Madagascar was in Sambaina. After two high-level missions in November 2005 and June 2006were carried out, a digital classroom that will serve more than 600 students of the community was inaugurated. In order to accelerate the digital alphabetisation of the community and create new jobs, a new community area has been made accessible to all and a refurbished health presidium has been equipped for pregnant women and newborn children.

Partners on this project include the UN Public-Private Alliance for Rural Development (UNPPA) and representatives from all stakeholders: universities (University of Oklahoma, Politecnico di Milano, Università Cattolica del Sacro Cuore), companies (Microsoft, Siemens, Telespazio, Pianeta, Water B2B, etc.), civil society (above all the community of Sambaina, which has been fully involved in the whole process), and the Government of Madagascar.

The next steps for the centre are to gain connectivity by acquiring the broadband satellite signal that can be received and distributed bi-directionally, a Wi-Fi system for the whole territory, and teleconference equipment. As well, there are plans for a train-the-trainer programme, to offer broadband services, and to act as an incubator and hub for economic activities.

International Network for the Availability of Scientific Publications (INASP)
INASP is an international network that encourages the creation and production of information, promotes sustainable and equitable access to information, fosters collaboration and networking, and strengthens local capacities to manage and use information and knowledge. Their activities include:

- Improving access to scientific and scholarly information

- Catalysing and supporting local publication and information exchange
- Strengthening local capacities to manage and use information and knowledge
- Fostering in-country, regional, and international co-operation and networking
- Advising local organisations and funding agencies on ways to utilise information and publishing to achieve development goals

INASP's Programme for the Enhancement of Research Information (PERI) supports capacity-building in the research sector in developing and transitional countries by strengthening the production, access, and dissemination of information and knowledge.

For more information: www.inasp.info

Jacaranda
The Jacaranda network comprises a number of institutions that share their bibliographic records, exchanges documents, conducts joint training courses, and sensitises decision-makers on the importance of information. The network is also involved in the publishing of catalogues on specific subjects.

Private Companies
A number of private of companies are also involved in ICT training:

- Institut Supérieur de Technologies d'Antsiranana (ISTS) provides training in infomatics and computer maintenance
- Institut Supérieur Polytechnique de Madagascar (ISPM) has a programme in engineering
- Infocentre runs a three-year training course in computer and information sciences.

SchoolNet Association of Madagascar
The SchoolNet Association of Madagascar was launched in 2005. Since then it has mainly been involved in activities supported by the International Institute for Communications and Development (IICD) Global Teenager Project which encourages on-line collaborative learning programmes with young learners from all over the world.

SchoolNet Madagascar has also trained 220 learners and teachers to participate in the Mtandao Afrika programme supported by Microsoft's Unlimited Potential Program, which assumes the form of a contest to encourage learners and teachers across Africa to form teams to develop educational Web sites.[14]

Support Technology for Educators and Parents (STEP)[15]
The USAID supported a pilot project known as the STEP programme in three provinces in Madagascar: Toliara, Finarantsoa, and Tamatave for 2006 to 2008. STEP works with the Ministry of Education National and Scientific Research (MENRS) to build the capacity of its personnel to offer high-quality training and support to Madagascar's growing numbers of teachers and schools. Activities focus on three distinct but linked domains: strengthening in-service teacher training, increasing community support to local primary schools, and strengthening local planning for teacher professional development.

STEP allows MENRS, USAID, and other partner NGOs to test and evaluate technology-based education support mechanisms that could add value on a nationwide scale as a means of maintaining educational quality and promoting a well-informed democracy. The programme used context-appropriate technology-interactive radio instruction, community radio programmes, and digital applications as both the catalyst for action and the mechanism to build the capacity of MENRS personnel at central and decentralised levels.

Universities

The Université d'Antananarivo is the largest university in the country with over 30 libraries and documentation centres. The university hosts the Centre Syfed of AUPELF/UREF, which is connected to the major ISP, Data Telecom Services (DTS), Internet hub. The Faculté des Sciences of the Université d'Antananarivo has a department specialising in mathematics and information sciences. The Ecole Nationale d'Informatique of the Université de Fianarantsoa has graduate programmes in computer and information sciences.

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in Madagascar in terms of enabling or constraining features in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation	Madagascar has a national ICT policy and an overall economic and social development policy with extensive reference to the development of ICT infrastructure in the country, including in schools.	There is no dedicated ICT in education policy and there is limited reference to education and the use of ICTs in the country's existing policies on ICT and economic and social development.
Advocacy leadership	Dedicated government ministries are assigned responsibility for priority projects for ICT infrastructure development.	There is no dedicated leadership around ICTs in education even though there are a few projects, largely civil society trying to take the lead.
Gender equity		There are no explicit references to gender equality and women's empowerment

		through the use of ICTs in general or in education.
Infrastructure and access		ICT infrastructure remains very limited within education institutions in particular.
Collaborating mechanisms		There appears to be limited collaborative mechanism to promote ICTs in education in particular.
Human resource capacity		There remains a very limited layer of skilled personnel and champions at the national level concentrated around a network of skilled engineers and personnel developed at the CIEUM.
Fiscal resources		There appears to be limited budget for ICTs in education and limited donor funding support.
Learning content		Local contextually relevant learning content is currently lacking.
Attitudes	Within government leadership at the highest levels have displayed a positive and supportive attitude towards ICTs for development in general.	

Notes

1 The World Factbook 2007. https://www.cia.gov/cia/publications/factbook/geos/ma.html
2 Ibid.
3 Ibid.
4 "Beyond Scarcity: Power, Poverty and Global Water Crisis." Human Development Report 2006. UNDP. http://hdr.undp.org/hdr2006/
5 Madagascar Education. http://www.country-studies.com/madagascar/education.html

6 EFA Global Monitoring Report. 2007. http://portal.unesco.org/education/en/ev.php-URL_ID=49591&URL_DO=DO_TOPIC&URL_SECTION=201.html
7 Madagascar Action Plan. http://www.madagascar-presidency.gov.mg/MAP/
8 Global Information Technology Report. World Economic Forum. http://www2.weforum.org/site/homepublic.nsf/Content/Global+Competitiveness+Programme/Global+Information+Technology+Report.html
9 The World Factbook 2007. https://www.cia.gov/cia/publications/factbook/geos/ma.html
10 Madagascar Action Plan. http://www.madagascar-presidency.gov.mg/MAP/
11 ICT Policy in Madagascar. http://africa.rights.apc.org/index.shtml?apc=21873s21844e_1
12 AVU Madagascar. http://72.14.235.104/search?q=cache:ehwLd82mwH0J:www.avu.org/documents/Fact-Sheet.pdf+ict+education+madagascar&hl=en&ct=clnk&cd=7&gl=za
13 Madagascar NICI Infrastructure. http://www.uneca.org/aisi/NICI/country_profiles/Madagascar/madaginfra.htm
14 Mtandao Afrika : Madagascar 2006 training program. http://www.mtandao-afrika.org/English/Training06Madagascar.aspx
15 International Education Systems of EDC. http://ies.edc.org/ourwork/project.php?id=3772&topic=13

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ICT for Education in Malawi

by Shafika Isaacs
May 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

The findings, interpretations and conclusions expressed herein are entirely those of the author(s) and do not necessarily reflect the view of *info*Dev, the Donors of *info*Dev, the World Bank and its affiliated organizations, the Board of Executive Directors of the World Bank or the governments they represent. The World Bank cannot guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply on the part of the World Bank any judgment of the legal status of any territory or the endorsement or acceptance of such boundaries.

It is expected that individual *Country Reports* from the *Survey of ICT and Education in Africa* will be updated in an iterative process over time based on additional research and feedback received through the *info*Dev web site. For more information, and to suggest modifications to individual *Country Reports*, please see www.infodev.org/ict4edu-Africa.

Overview

A highly impoverished country, Malawi has a dedicated national ICT policy that includes the promotion of ICTs in education. It also has a few innovative initiatives in this area, committed largely to the promotion of ICT access in schools and integrated library and information services and networks.

Country Profile

Malawi is one of the poorest countries in the world with a per capita Gross National Income of USD$160.[2] It is classified as a least developed country by the United Nations and a highly indebted poor country by the World Bank. The country has a narrow economic base with no mineral resources and is heavily dependent on agriculture. Nearly 90% of the rural population derive their livelihood from agriculture. Agricultural produce accounts for 90% of Malawi's exports.[3]

However, the agricultural sector has deteriorated in the past ten years and 80% of the country's population lives in rural areas where access to basic social services is severely limited. The country is very densely populated with a very high rate of forest loss and a fragile environment.

Poverty is widespread in both rural and urban areas with nearly half of Malawi's population struggling to live on less than USD$1 a day. Income distribution is very unequal.

A continuing food crisis in Malawi afflicts more than four million people, and more than a million of them are children under the age of five or pregnant women. Food insecurity is not only a major cause of malnutrition, but has also worsened the risk for diseases such as cholera and AIDS.[4]

Table 1 provides some selected socio-economic indicators for the country.

Table 1: Basic Economic Indicators: Malawi

Indicator	
Population (2005)	12.9 million
Languages	Official language: Chichewa. Other languages: Chinyanja, Chiyao, Chitumbuka, Chisena, Chilomwe, Chitonga.
2005 Economic activity (% of GDP)	Agriculture: 34.7% Industry: 19.4% Services: 45.9%
Human Development Index (2004)	166 (out of 177 countries)
Per capita gross national income (US dollars)	$160 (2004); $160 (2005)

The Education System

Malawi has an 8-4-4 education system consisting of primary school, secondary school, and university, which is the duration of compulsory education. Most children start formal education at primary school at the age of six. The primary school takes eight years from Standards 1 to 8 at the end of which pupils write the Primary School Leaving Certificate examinations. The introduction of free primary education in Malawi has seen a large increase in the number of pupils, but this increase in access has also brought major infrastructure problems and a decline in quality.

Secondary school education takes four years from Forms 1 to 4. Students can attend secondary school in public schools run by the government or in private schools run by the private sector and individuals. The quality of secondary education varies widely. In general, fees in private schools are more than 50 times that in public schools. For a long time, secondary education was very restrictive in Malawi but this situation is changing positively due to rapid expansion of private schools as well as government-run community day secondary schools.

Malawi has two universities: the University of Malawi, which opened in 1965, and Mzuzu University, which opened in 1997.

Technical and training colleges offer courses in fields such as forestry, marine science, social welfare and hotel management, as well as in various trades. These courses lead to certificates awarded after studies lasting between six months and four years.

Primary school teachers are trained in primary teacher-training colleges. The Malawi Institute of Education provides introductory courses to give school leavers the basic skills to act as “assistant” or “pupil teachers.” Secondary school teachers are trained at Chancellor College, which offers a four-year educational programme, and at a college of education for secondary school teachers at Domasi in Zomba. The Mzuzu University now also trains secondary school teachers.[5]

Table 2 provides a snapshot of education indicators in Malawi.

Table 2: Selected Education Data

Indicator	
Enrolment in primary education (% gross)*	125 (2004)
Enrolment in secondary education (% gross)*	29 (2004)
Transition to Secondary	76 (2003)
Enrolment in tertiary education (% gross)*	0.4 (2004)

Gender Parity Index (GPI)**	1.02 in primary; 0.81 in secondary; 0.54 at university (2004)

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
*GPI = gross enrolment ratio (GER) of females, divided by the GER of males and indicates the level of access by females to education compared to males. In Malawi, there is gender parity for primary education, but it declines at the secondary level and again at university.

Primary school enrolment rates remain high, with no gender gap.[6] However, the education system in Malawi faces many challenges in most areas including access, equity, quality, and internal efficiency. HIV/AIDS affects nearly a million people, including 83,000 children. Nearly a third of infected mothers pass the virus to their babies. Half of Malawi's one million orphans have lost one or both parents to AIDS. Child abuse, sexual exploitation, and child labour are serious problems, especially among girls and orphans.

Malawi's economy also suffers a serious skills deficit, especially in the ICT sectors. Malawi reportedly has 20 skilled librarians of which only 20% have ICT skills.[7]

Infrastructure

As is the case with most other developing countries, Malawi faces a number of human and financial resource constraints to the development of its ICT sector. These include underdeveloped ICT infrastructure, high cost of telecommunications, and unstable and unreliable power.

Table 3 provides an overview of Malawi's ICT infrastructure.

Table 3: ICT Infrastructure Indicators

Indicator	
Fixed-line subscribers (2004)	93.0 per 1,000 persons
Mobile subscribers	222 per 1,000 persons
Dial-up subscribers (2005)	16.2 per 1,000 persons
Broadband subscribers (2004)	0.0
Internet users (2004)	46.1 per 1,000 persons
Television broadcast stations	1 (2001)
Radio stations	AM 9; FM 5; shortwave 2 (2001)

Malawi adopted a communication policy in 1998 which has universal access, rural connectivity, liberalisation, and private sector involvement as key objectives. It has also established the Malawi Communications Regulatory Authority (MACRA).

ICT Policies

Vision 2020
Malawi has developed a visionary policy statement that says, in part, "by the year 2020, Malawi as a God-fearing nation will be secure, democratically mature, environmentally sustainable, self reliant with equal opportunities for and active participation by all, having social services, vibrant cultural and religious values and being a technologically driven middle-income economy." The policy statement has a dedicated human resource development component that states that Malawians aspire to have adequate and good quality social services especially education and health and efficient and effective utilisation of human resources in both the public and private sectors.[8] Vision 2020 sets the conceptual parameters for subsequent policy including national ICT policy.

National ICT for Development Policy[9] (ICT4DP)
A number of existing policies, legislation and programmes have in one way or other informed and fostered the development of this ICT4D policy as well as the Communications Act, Science and Technology Act, establishment of SchoolNet Malawi, the removal of import duty on pre-assembled computers and printers, the introduction of computer studies in secondary school curriculum, and the establishment of government Wide Area Network (GWAN).

After initial support from the United Nations Economic Commission for Africa (UNECA), which assisted with the development of a national ICT policy framework report, the Government of Malawi adopted a National ICT for Development Policy in December 2005.

The policy seeks to address an array of problems faced by the Malawian economy and society which include:

- Inadequate market information flow especially on small domestic markets
- "Brain drain" in the ICT sector due to low remuneration (Essentially, the brain-drain is at two levels: from Malawi to other countries especially within the SADC region, and from the public sector to the private sector.)
- Inadequate institutional capacity at national, sectoral, and organisational levels
- Negative attitude towards technology change
- Underdeveloped telecommunications infrastructure especially in rural areas
- Outdated laws that support ICT development, deployment, and utilisation.
- Fragmentation of administrative and political leadership in the ICT sector
- Proliferation of sub-standard ICT schools, syllabi, and service delivery
- Underdeveloped research and development capacity in ICT
- Underdeveloped ICT private sector

Its vision is for an ICT-led Malawi and its mission is to facilitate the creation of an enabling environment for efficient, effective, and sustainable utilisation, exploitation, and development of ICTs in all sectors of the economy in order to attain an information-rich and knowledge-based society and economy. This policy has a dual focus. It aims at developing the ICT industry and sector and promoting the development and use of ICTs

in all sectors for the greatest impact in socio-economic development. It is focused on eight thematic areas:

- Strategic ICT leadership
- Human capital development
- Governance
- ICT industry
- ICT infrastructure
- ICT growth sectors as identified in the Malawi Economic Growth Strategy (MEGS)
- Community access to ICTs
- Responsive ICT legal, and institutional regulatory framework

All these areas are deemed necessary for ICTs to enhance rapid growth of the economy.

The dedicated section on human capital development and education is an attempt to:

- Facilitate the deployment, utilisation, and exploitation of ICT within the educational system in order to improve access, quality, relevance, and delivery at all levels
- Achieve universal basic ICT literacy and improve the level of ICT literacy in the country
- Transform Malawi into an information- and knowledge-driven ICT literate nation
- Improve the management of education systems through the utilisation of ICT

Some of the strategies to achieve these objectives include:

- Mainstreaming ICTs throughout the entire educational system to promote lifelong learning
- Ensuring that primary and secondary schools and colleges have adequate and reliable computers
- Building facilities to promote ICT and computer-aided training at all levels including primary schools and nurseries
- Intensifying ICT education and training in all training institutions
- Encouraging collaboration between local and international educational institutions to facilitate educational exchange and promote ICT education and training
- Facilitating collaboration between the Ministry of Education and various accreditations
- Introducing ICT technical colleges in all regions of the country
- Promoting e-learning and e-teaching including e-distance education, training, and virtual learning systems to complement and supplement face-to-face campus, televised, and broadcast education and training systems
- Ensuring that all local universities and colleges take steps to progressively offer their programmes and courses on-line to broaden access to higher education to a large section of the population
- Promoting awareness on available opportunities to enable students, teachers, and educational institutions to purchase ICTs
- Facilitating the automation of libraries as a tool for e-research and e-learning
- Setting up special libraries to support ICT research and development

- Developing user-friendly electronic educational management information systems to improve the quality of management of educational institutions

Because Malawi has a severe shortage of skills, the policy also contains an accelerated plan for human resource development to promote and improve research and development capacity in ICT target the development and enhancement of technical, managerial, and operational skills in the use and deployment of ICTs in the public, private, and informal sectors.

The policy further contains strategies to reach under-served disadvantaged communities by promoting local content and applications in the ICT sector to meet the needs and requirements of the nation. It has a specific objective of building the capacity of women, youth, and other disadvantaged groups to implement ICT initiatives with dedicated strategies and funding.

Policy Implementation
The implementation of the policy will be centrally co-ordinated and supported by key sector agencies and institutions. The following institutions or agencies will play a central role:

- Ministries responsible for ICT matters
- The Department of Information Systems Technology and Management Services (DISTMS)
- Malawi Communication Regulatory Authority (MACRA)
- The National Information and Communication Technology Council (NAICT)

The Ministry of Education's responsibility will be to promote and facilitate the ICT skills acquisition and utilisation in all areas and levels of education and training in order to eliminate illiteracy in the country, while the Ministry of Gender, Child Welfare and Community Service will ensure that disadvantaged and marginalised communities participate fully through specific ICT initiatives. The Ministry of Youth, Sports and Culture is responsible for promoting the active participation of boys, girls, women and disadvantaged groups through ICT clubs and other promotional incentives.

The NICTC is a national body chaired by the president or the vice president with the mission to provide national leadership on all matters relating to the development of the Malawian information society. The Malawi Information and Communication Technology Agency (MICTA) was also established as a statutory and autonomous agency to act as the national ICT implementation and co-ordination body under the direct supervision of the NICTC and to act as its secretariat.

Current ICT Initiatives and Projects

There are a few noteworthy initiatives in Malawi that attempt to bridge the digital divide. Many of these initiatives depend on donor funding from groups such as the World Bank,

Swedish International Development Agency (SIDA), Department for International Development (DFID), and the Japanese International Co-operation Agency (JICA).

Computers for African Schools Malawi (CFAS)
The Computers for Malawian School scheme is jointly administered by the British Council and SchoolNet Malawi, which is a registered trust within the SchoolNet Africa organisation. The scheme's administrative committee is made up of academic and business representatives, as well as Ministry of Education and British Council personnel.

- The British Council receives the goods exempt of duty in Lilongwe. They are transferred to the SchoolNet facilities in Blantyre where the SchoolNet staff check, process, and repair the equipment. Microsoft OS and MSOffice are installed by agreement with Microsoft. The SchoolNet team also sets up the computers at the recipient schools.
- As in all recipient countries, strict criteria are applied to the candidate schools to ensure they have the right facilities and security to house the equipment. Each school receives 10 to 15 computers and a printer. Training of the teachers in ICTs has been arranged by the British Council, and UK trainers have travelled to Malawi to carry out training courses.
- In conjunction with the scheme, the Malawian Ministry of Education has developed an ICT curriculum.
- Schools are encouraged to ensure long-term self-sustainability for the facilities through their PTA. They are encouraged to raise money to replace or add to their equipment through fundraising, community use of the facilities, and, if necessary, asking parents for small contributions.
- Each recipient school is required to give a report on its experience with the computers and is subject to audit.
- The committee's objective is to have an ICT lab in all secondary schools with electricity by the end of 2008.

Information on the scheme in Malawi is shown on the SchoolNet Malawi Web site and a list of recipient schools is shown on the Malawian schools page.

For more information: www.cfas.org.uk

Malawi Library Information Consortium (MALICO)
MALICO was established in May 2003 as a consortium of organisations that combine talents and resources to promote and deliver library and information services for Malawi and the global community. Its institutional membership organisation participates in the acquisition and delivery of relevant electronic resources. MALICO's mission is also to offer leadership in library co-operation, training and development, mechanisms for improved access to information, and a capacity for members to respond to the information needs of the country.

The consortium's objectives include encouraging national, regional, and international co-operation among information stakeholders in Malawi; influencing information policy in Malawi; promoting adequate ICT infrastructure for members, especially sufficient Internet bandwidth; assisting in the development of appropriate ICT skills at all levels; facilitating access to electronic journal articles in international databases; organising and digitising Malawian content; and providing information consultancy.

MALICO has initiated a few projects such as 4 VSAT**.** With the support of the Open Society Initiative for Southern Africa (OSISA) and with supplementary funding from the Open Society Institute and the World Bank and the University of Malawi Dossani Trust, MALICO bought four VSATs which were mounted on three University of Malawi campuses and at the Mzuzu University in February 2005. This lays the basis for MALICO to support the planned National Education Research Network (NREN).[10]

MALICO contributes to subscription of e-resources by PERI and the electronic Information for Libraries (eIFL) and access e-resources from a host of institutions such as WHO, FAO, INASP, and CTA. They also assist with digitising Malawi publications. For instance the College of Medicine has digitised over 300 publications, and University of Malawi has reportedly bought digitisation equipment. This project also involves creating institutional repositories through post-graduate degree programmes.

MALICO's Internet for Influence Program, which was initiated by the British Council, involves librarians training various groups on how to use computers and access the Internet. Training programmes include women members of parliament, young women leaders, lawyers, and journalists.

Malawi Research and Education Network (MAREN) is another MALICO project that involves establishing high-speed Internet connectivity among tertiary education institutions. National research and education networks are national organisations in Africa and elsewhere representing groups of tertiary education institutions. Their mandate includes, among other things, improving Internet connectivity for members. MAREN is also is one of the founding members of the UbuntuNet Alliance for Research and Education Networking. MAREN has two founder members: the University of Malawi and Mzuzu University. Two other institutions are in the process of joining: the National College of Information Technology (NACIT), a tertiary institution; and the Department of Agricultural Research, a research institution. Two new universities are likely to join within the year.

For more information: www.malico.mw

National Library Services

The National Library Services (NLS) has 10 branches throughout Malawi, many of which are in rural areas with no electricity. Its Mother and Child Project aims at encouraging mothers to read and tell stories to their children, and has introduced computer games and lessons so that the children are encouraged to learn how to use computers at a very early stage.

The NLS has also established the Baobab Project which involves offering two low-cost PCs operating on low power for each library. These computers are run on solar panels or wind turbines with a high-battery life.

SchoolNet Malawi

SchoolNet Malawi is a non-governmental, non-profit organisation formed to provide and facilitate access to ICTs in Malawian schools. The ICT for schools concept is very new in Malawi and the initiating organisation itself is still in the conception stage. The ICT development for schools concept was hatched after the SchoolNet Africa Cape Town Declaration (September 1999) represented by 10 African countries of which Malawi was one. This initiative was facilitated by the International Development Research Centre (IDRC) and SchoolNet South Africa.

SchoolNet Malawi has the following objectives:

- To market and lobby ICT development initiatives to schools, CBOs, the private sector, and the donor community
- To establish a functional, transparent organisation capable of implementing ICT development in Malawi
- To build sustainable human resources capacities that are able to effectively implement the set programmes
- To provide schools with connectivity learning facilities, locally and internationally
- To supplement the current schools education system with ICT content and curriculum in collaboration with the Ministry of Education
- To research and create ways of strengthening the development ICTs in Malawi
- To develop a functional, sustainable technical distribution and support centre capable of providing service to the whole nation.

SchoolNet Malawi sources second-hand PCs from various agencies, such as Computer Aid International, Computers for African Schools, and World Computer Exchange, and refurbishes and distributes them to Malawian schools based on detailed selection criteria. The organisation also conducts training programmes for both the teachers and students after each successful distribution phase. To date six schools have their own Web sites supported by SchoolNet Malawi.

As a partner of SchoolNet Africa, SchoolNet Malawi also participates in SchoolNet Africa programmes such as its Campaign for 1 Million PCs, and ThinkQuest Africa (now called Mtandao Afrika). The latter programme involves both the students and the teachers and provides them with advanced knowledge on how to create personal Web sites in the local language. This has become a sort of competition, with the winners enjoying a camping holiday in an African country. The participants are also given certificates of participation.

In 2006, SchoolNet Malawi partnered with Malawi Open Source Society to lobby and advocate for the use of open source in schools. Together they hosted a workshop with the support of OSISA in early 2006.[11]

SchoolNet Malawi also employs volunteers on both the technical and training side. Volunteers assist with testing and maintaining computers, packing computers for distribution in schools, and training teachers and students.

SchoolNet Malawi's partners include the British Council Malawi, Computers for Africa (CFAS), ComputerAid International, Old Mutual, Malawi Telecommunications Limited, Reserve Bank of Malawi, ComputerLand Limited, Microsoft South Africa, Open Society Initiative for Southern Africa (OSISA), and SchoolNet Africa. To date SchoolNet Malawi has distributed more than 832 computers to 50 participating schools.[12]

For more information: www.schoolnetmalawi.org

University of Mzuzu
The University of Mzuzu offers library and information science and ICT degree programmes.

For more information: http://www.mzuni.ac.mw

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in Malawi in terms of enabling or constraining features in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation	Malawi has a national ICT policy that includes significant dedication to ICTs in education and human capital development.	
Advocacy leadership	Malawi has champions for the cause of ICTs for development at the highest level in government, in various government ministries, and within civil society and the local private sector.	
Gender equity	The national ICT policy mentions a commitment to gender equality and women's empowerment. The	

	policy also allocates responsibility for the promotion of girls and women through the use of ICTs with the Ministry of Gender. Malawi also has a number of women champions promoting ICTs in education who serve as worthwhile role models.	
Infrastructure and access	Malawi's national policies promote a commitment to universal access and a range of organisations and groups have made headway in improving the country's ICT infrastructure.	Malawi has a very poor and underdeveloped ICT infrastructure and very low levels of ICT access in education institutions.
Collaborating mechanisms	Malawi's national ICT policy refers to dedicated intergovernmental structures to promote collaboration in the realisation of policy objectives.	
Human resource capacity		Malawi has extremely limited human resource capacity exacerbated by very high levels of illiteracy.
Fiscal resources		Malawi's ICT for development strategy is strongly dependent on external donor funding.
Learning content	Malawi's information services and library organisations have made headway in digitising Malawian publications	There is little digital education content based on the local curriculum frameworks available in Malawi's education institutions.
Procurement regulations	Malawi has legislated a tax waive on the import of computers and accessories.	
Attitudes	Malawian government, local private sector, and civil society have demonstrated an enthusiasm and positive attitude in promoting ICTs for development in general and in education in particular.	

Notes

1 The World Factbook 2007. https://www.cia.gov/cia/publications/factbook/geos/mi.html

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ICT in Education in Mali

by Babacar Fall
June 2007

Source: *World Fact Book* [1]

Please note:

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Overview

Mali has a national policy and strategic plan for ICT, administered through the Information and Communications Technology Agency (AGETIC). One of its missions is to set up an empowering environment for the promotion and use of ICT in education and capacity-building for the formal and non-formal sectors.

Though certain challenges obstacles persist -- such as a very low level of development of the telephone networks and no direct access to an Internet backbone -- a number of actors, including the Ministry of Education, local and international public and private partnerships, and many others, remain committed to enhancing Mali's education system. Notable Initiatives in the formal system include a university intranet, the Nepad e-Schools Demo project, Internet in schools, SchoolNet Mali and, in non formal education, the UNESCO Community Multimedia Centre Scale-Up Project which enables ICT access for villages.

Country Profile

Mali is a landlocked West African country with a surface area of 1.24 million square kilometres and a population of about 13.5 million people, 73% of which live in rural areas. The population density is very disproportionate, from 90 people per square kilometre in the Niger central delta to less than five people per square kilometre in the north Saharan region.

A former French colony, Mali (Sudan Republic) became independent in 1960. Its capital is Bamako (population: 840,000). It shares its borders with Mauritania and Algeria on the north, Niger on the east, Burkina Faso and Côte d'Ivoire on the south, Guinea on the southwest, and Senegal on the east. The highest point is Hombori Tondo in the central region of the country. Table 1 provides some selected socio-economic indicators for the country.[2]

Table 1: Socio-economic Indicators: Mali

Indicator	2000	2004	2005
Total population	11.6 million	13.1 million	13.5 million
Population growth (annual %)	2.9	3.0	3.0
Poverty head count ratio at national poverty line (% of population)	..	..	..
Life expectancy at birth, total (years)	47.6	48.3	..
Fertility rate, total (births per woman)	7.0	6.8	..
Mortality rate, infant (per 1,000 live births)	124.0	121.0	..
Mortality rate, under 5 (per 1,000)	224.0	219.0	..
Immunisation, measles (% of children ages 12-23 months)	49.0	75.0	..
Prevalence of HIV, total (% of population ages 15-49)	..	..	1.7
Primary completion rate, total (% of relevant age group)	28.5	44.0	..
School enrolment, primary (% gross)*	52.8	63.8	..

School enrolment, secondary (% gross)*	15.0	22.3	..
School enrolment, tertiary (% gross)	..	2.1	..
Ratio of girls to boys in primary and secondary education (%)	71.3	74.4	..

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.

The Education System[3]

As in other countries of the francophone world, the Malian educational system inherited most of its principles from the French colonial system. Yet, since independence, it has undergone a set of reforms to meet the needs of the local population. The Ministry of Education is responsible for governing the whole system and implementing the policy of the government. Instruction is given in French. A normal school year runs from September to June.

Fundamental education encompasses nine grades, divided into two cycles. Grades 1 through 6 make up the first cycle. In the sixth grade all the students sit for the C.E.P. which leads to the second cycle: Grades 7 through 9 (junior high school). In the last grade of the second cycle, the students take a nationwide exam called the Diplôme d'Etudes Fondamentale (D.E.F.) which leads to high school or vocational and technical school.

Secondary education (senior high school) comprises Grade 10 through 12. All Grade 12 students sit for the baccalaureate exam (high school diploma) in biology, maths/physics, human sciences, or language and literature. With the baccalaureate the students can enrol at the University of Mali or apply for universities abroad. The baccalaureate is a very selective examination for the students.

Students who do not envision completing long-term study programmes can enter two- to four-years public/private technical and vocational schools, which are all recognised by the Ministry of Education. Two-year vocational and technical schools offer the Certificat d'Aptitude Professionnelle (CAP) and the four-year schools offer the Brevet de Technicien (BT).

In Mali, the education sector has always been considered as a priority because of its impact on development, which is why the proportion of the national budget devoted to education has noticeably increased in the last few years, from 26.62% in 2001 to 30.6% in 2004.[4] :

The Ten-Year Education Development Program (PRODEC), signed in 1999, is regarded as the Malian government's commitment to fund all its education systems. It is based on the strengths and weaknesses of the system in terms of accessibility, quality, and management. It applies to all levels of formal education (primary, secondary, and higher education) and comprises 11 priority domains**:**

- A universal and qualitative basic education
- A professional education adapted to economic needs
- A high-performing, renovated general and technical secondary education
- A quality higher-education, adapted to the priority needs and fixed costs
- The use of native languages in addition to French
- A policy on books and teaching/instructional materials
- A strong policy for teacher training

- A strong partnership about education
- An institutional adjustment and reconstruction necessary for a renovation of the education system
- A communication policy focusing on exchange and dialogue among all partners
- A strong and well-balanced financial policy that is reasonable and keeping with decentralisation

Non-formal education consists of:

- Adult literacy
- Education centres for development (CEDs)

ICT Policies

The national policy and domestic strategy plan[5] for ICT aims at defining a Malian vision for applications as well as the objectives and roles and responsibilities of the stakeholders. It also fixes completion deadlines. AGETIC (Agence des technologies de l'information et de la Communication) has been created to ensure the administration and implementation of the policy.

For 2007 the priority actions are:

- Setting up a legal and statutory framework
- Developing ICT infrastructure
- Education and capacity-building
- Health support
- Good governance and administrative intranet
- Popularisation of Internet access and connection of all communities of Mali

Infrastructure

Mali's telephone network is at a very low level of development. The development of its telecommunication infrastructure is mostly in the urban areas with 69.9% of all lines in the biggest cities. Its telephone density (telephones per hundred people) in urban areas is 1.78, compared to 0.08 for the rest of the country.[6]

Internet in Mali is limited because there is no direct access to a backbone (because there is no sea access). Therefore, Mali must negotiate its access to international telecommunication networks with the neighbouring nations of Senegal and Côte d'Ivoire. Thus, there are two main international channels for Malian telecommunication networks. The first one goes from Senegal to Bamako via Kayes. On this route, Ikatel has laid an optical fibre, whereas Sotelma uses a high-tension electric cable. The second channel goes from Côte d'Ivoire to Bamako via Sikasso, passing through Burkina Faso. On this route, Sotelma invested FCFA7 billion in optical fibre in May 2004.[7]

Table 2 provides a snapshot of the state of national ICT infrastructure in the country.

Table 2: ICT in Mali[8]

Indicator	
Population (in millions)	13.5
Literacy rate	27.2
Gross National Product (per capita)	240
Televisions per 1,000 people	17
Radios per 1,000 people	180
Fixed telephone lines per 1,000 people	4
Cellular phones per 1,000 people	4
Personal computers per 1,000 people	1.2
Internet users (in thousands)	30

ICT in Education

ICT is introduced as a school subject in the first years of primary level in order to enable Mali to face the challenges of the technology revolution. In addition, the government of Mali will be taking some legal and statutory incentive measures to increase e the cyber cafés and Internet usage. In so doing, young Malians will have more opportunities to communicate and exchange with other youth around the world. Noticeably, USAID has invested over a billion CFA francs to interconnect 10 sites of the University of Bamako.

Cyber Edu

The Ministry of Communication and New Technology and the Ministry of National Education have initiated an education cyberspace project called Cyber Edu, which provides some facilities for the teachers and the school managers to collect virtual educational resources for improving their professional activities. In Bamako, two school groups. Mamadou Konate and Kalaban Coura, have benefited from this project with computer labs equipped with 15 to 30 computers. This project involves10 school groups and three Schoolmasters Training Institutes (IFM) in the regions of Sikasso and Mopti and in the District of Bamako. It will enable teachers to seek further information that can enhance and enrich their lessons, and it also help better manage human resources and school materials.

Mali's partners from the Canton of Geneva in Switzerland support the project's accomplishment.

School Net Mali

Through this project, USAID has equipped certain Malian high schools with computer materials, thus giving students a chance to enjoy a first contact with a computer. SchoolNet Mali stems from co-operation between the Mokoya Juru Association and SchoolNet Africa.

The objectives of SchoolNet Mali are to:

- Equip schools with computers
- Train teachers and students on how to use the computers
- Convince people that new technology and its uses are at their reach
- Set up the bases of systematic exchange between Malian educators and those around the world

- Integrate new and renewable energies in the school system

Strategic partners of SchoolNet Mali are Global Teenagers Project (GTP)-Mali, iEARN International, and AMUL (Malian Association for Linux users).

Non-formal projects
UNESCO, with support from the Italian government, is developing a pilot training programme in ICT for those working in the areas of literacy and informal education. The objectives aim to:

- Increase visibility of the non-formal education process with the help of ICT
- Enable those who work in literacy and non-formal education to take advantage of ICT possibilities, especially to produce and exchange information across electronic networks

Current ICT Initiatives and Projects

Internet in School
The Internet in School project is designed to facilitate Internet access for students in secondary education. It makes it possible for these students to have access to an infrastructure at the international level and a staff of Malian faculty trained in ICT. The project is the result of an agreement between the International Telecommunications Union (UIT), Swisscom, the national Ministry of Education, and the Department of Communication and Technology. It is funded by Swisscom at about FCFA80 million. Begun in 2003, this project was completed in 2005.

Classroom connections
The Department of Communication and Technology ensured the installation of a line connection in a high school classroom through Sotelma. This enabled a connection to Internet as well as the necessary technical installations to make sure that the computers function properly.

TOGUNET
TOGUNET is a network for exchanging and sharing information among ICT users for development in Mali. TOGUNET currently has nearly 200 subscribers or members.

PNUD
PNUD (United Nation Program for Development) and CEA (Economic Commission for Africa) help Mali develop its own cyber strategy.

Teacher training
On-line teacher training is provided by the University of Montreal in Canada and by the International Institute for Capacity-Building in Africa (IIRCA).

ROCARE
ROCARE, in partnership with IDRC and the University of Montreal, works with some local schools to carry out case studies in order to better understand the conditions that favour a successful integration of ICT in the school environment .The following schools are schools involved:

- Mamadou Goundo Simaga science department
- Kalanso "espace éducatif"
- Le Progrès
- Danzie Kone High School of Koutiala
- "La Lumière" High School

Afribone
Afribone is a private Malian organisation founded in 1999 that offers innovative services such as Internet connection and training sessions related to ICT development in Mali to regular customers. After completing a survey of Malian companies, and considering the needs of agents as well as managers, Afribone is in a position to provide training in a wide range of subjects, namely:

- Human resources management
- Project management
- Labour management
- Multimedia and ICT
- Technology networks
- Communication and marketing
- Training trainers
- Company and association management

CMC Scale-Up Project
The UNESCO Community Multimedia Centre (CMC) Scale-Up Project is a major asset to the informal education sector and makes ICT accessible to community members. Currently there are 23 CMCs where people can access computers, printers, community radio, digital devices, and other services.

For more information: www.unesco.org/webworld/cmc

CLIC
The Community of Learning and Information Centre (CLIC) project is funded by the U.S. Agency for International Development (USAID) through USAID/Mali and administered by Afriklinks which sets up and supervises centres for access to ICT, conceives and presents training modules, designs and installs networks, and follows up on and evaluates programmes.

USAID
USAID supports 13 pilot community-of-learning and information centres, which offer access to the Internet, e-mail, CD-Roms, video programming, and general computer use to potentially over 450,000 Malians in local communities.

For more information: www.usaid.gov/locations/sub-saharan_africa/countries/mali/.

NEPAD e-Schools Initiative
This project is being led by the e-Africa Commission, the special task team of NEPAD responsible for the structured development of the ICT sector on the African continent. The NEPAD e-Schools Initiative will, over a 10-year period, develop all African schools (estimated to be in excess of 600, 000) into NEPAD e-Schools. These schools will be provided with the necessary infrastructure and ICT equipment. They will also have teachers that are appropriately trained and who will have access to appropriate applications and digital

content to ensure that ICTs play a meaningful role in enhancing education and health conditions on the African continent. Six schools in Mali are currently participating in the demonstration phases of the initiative.

Implementing ICT in Education: What Helps and What Hinders?

The Malian government's commitment to fuse the education system with the technological innovations available today will prove to be a boost for Mali's education system. The main constraints to adapting schools to ICT use stem from the slow development of infrastructure and the high cost of ICT materials.

Table 3 provides a summary of the current stage of ICT development in Mali in terms of enabling or constraining features in the education system.

Table 3: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation	The adoption of a national policy and strategy for ICT aims at defining a vision for Mali in the field and determining the trends, objectives, roles, and accountability of stakeholders. The policy will also state the scheduling and deadlines.	
	The government has committed to a comprehensive training project for people in the education system.	
Gender equity		A digital divide exists between genders.
Infrastructure and access		There is insufficient computer equipment, inaccessible network access due to high cost, and a digital divide between the rural and urban areas.
Collaborating mechanisms	The national policy document broadly outlines decisions to be taken whereas the strategic plan document provides the priority actions by objectives and the roles and accountability of the stakeholders. It also sets the scheduling and deadlines	
Human resource capacity	Training will make it possible to develop human resources.	

Factors	Enabling Features	Constraining Features
Fiscal resources	VAT on imported computer equipment has been banned, which allows ICT development in the country and wider access.	There is high dependency on donors.
Learning content		There is weak development of educational contents.

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Overview

Mauritania's approach to the implementation of ICTs in the educational and public sectors has been to use the Université de Nouakchott as the focal point of its activities to enhance the usage of these technologies in the youth and the administration of the country in future. The university is providing the leadership, plans, training, and management of the entire process.

With the growth of the country's oil industry, financial constraints that previously could have impeded the country's drive towards its connectivity objectives will be reduced; this should help to advance the rollout of its Internet connectivity and electrification programmes. Challenges include the relatively low number of secondary schools, and corresponding low enrolment levels, which adversely impact the numbers of people who will become computer literate in the near-term, since the country's educational ICT development programme focuses mainly on the secondary and tertiary education sectors.

Country Profile

The Islamic Republic of Mauritania lies mainly in the Sahara Desert belt of northwest Africa. The country comprises 13 *wilayas* (regions), is about 60% desert, and is very vulnerable to climatic and environmental factors. It borders the North Atlantic Ocean and shares borders with Morocco, Algeria, Mali. and Senegal. The capital city and major port is Nouakchott.

Mauritania has a mixed population of blacks, light-skinned Moors, and a mixture of black-Moor extraction. Arabic and French are the official languages. The major ethnic languages are Pulaar, Soninke, Hassaniya, and Wolof. Forty percent of Mauritanians live below the poverty line.

Among the country's few income sources are iron ore, fish and fish products, and gold exports. About 25% of the population still depends on livestock and agriculture for their livelihood while 29% are in industry with 46% in services.[2]

Mauritania has offshore oil and gas deposits and it is one of the four oil refining countries in West Africa. Offshore oil extraction began in February 2006. The oil industry is a significant element in the country's economy since oil-derived products supply 95% of the country's commercial energy needs.[3]

Table 1 provides some selected soci-economic indicators for the country.

Table 1: Socio-economic Indicators: Mauritania

Indicator	
Population	3.2 million (2006 est.)

Growth rate	2.88% (2006 est.)
GDP (US dollars)	$1 billion
GDP per capita (US dollars)	$360
Human Development Index[4]	153 (out of 177 countries)

The Education System

Mauritania educational system consists of six years of primary school, three to four years of junior secondary, three years of senior secondary, and an open tertiary system. Compulsory schooling is nine years with the compulsory school age set at six years.

The Ministry for National Education (MEN) is responsible for basic and secondary education, and the Ministry for Higher Education and Scientific Research (MESRS) handles tertiary education. MESRS[5] was created in August 2005 to ensure that the Mauritanian educational system produces qualified graduates with requisite skills to sustain increased production and help diversify the economy, especially with the advent of the oil economy.

As Table 2 illustrates, other ministerial departments handle different aspects of the education sector particularly regarding technical and professional education.

Table 2: Ministerial Responsibility for the Education Sector

Ministerial Department	Sector
State Secretariat for Literacy and Original Teaching	Literacy
State Secretariat for Women's Affairs, Nursery Education and the Promotion of Women	Pre-school education, children, and women's welfare
Ministry for Health and Social Affairs	Public health and paramedics
Ministry for Fisheries and Maritime Economy	Naval training and fishing
Ministry for Rural Development and the Environment	Agriculture and rural professions development
Ministry for Power and Water Resources	Electricians
Ministry for Employment and Civil Service	Public administration and other vocational training

Table 3 reveals UNESCO's educational statistics showing the disparities between women and men.[6]

Table 3: Gender Disparity in Education

Indicator	Percentages
Literacy rate 2002-2004, men	60
Literacy rate 2002-2004, women	43

Primary enrolment rate 2000-2005, men	75
Primary enrolment rate 2000-2005, women	74
Secondary enrolment rate 2000-2005, men	16
Secondary enrolment rate 2000-2005, women	13

The issues of both student attrition rate in the first cycle of secondary education and the quality of teaching called for reforms which were carried out three years ago. The sciences and languages programmes were specifically revised to emphasise the teaching of English and French.[7]

The educational system is reported to have been mismanaged by unqualified personnel at various levels. In some communities only two or three classrooms serve as school with the children and teachers running shifts to use facilities.

Scarcely any schools[8] have been constructed for second cycle education since the early 1980s, and school buildings rarely look alike. Few students, upon graduation, choose to be teachers but prefer white collar jobs in the civil and public services or the private sector. The quality of teaching has reduced considerably because of teacher truancy even at the Université de Nouakchott with a student population of about 10,000. The university is one of very few in Africa to have eluded closure owing to political upheavals.

Infrastructure

Telephone infrastructure

Since 2004, Mauritel has lost its place as the sole national carrier for fixed telephone services, though it is still the only operator of fixed phone lines in Mauritania with a penetration rate of 1.6% covering all the major cities. Mauritel launched ADSL services early in 2006.

There are two mobile telephone operators in the country: Mauritel Mobiles of Mauritel SA and Mattel S.A. (Mauritano-Tunissienne de Telecommunications). The rate of penetration of cellular telephones is about 23% with Mauritel covering 70% of the market.[9]

Table 4 provides a snapshot of the state of the telephone and other ICT infrastructure.

Table 4: ICT Infrastructure in Mauritania

ICT	
Telephone main lines	41,000 (2005) [10]
Telephones mobile cellular	745,600 (2005)
Radio broadcast stations	AM 1; FM 14; shortwave 1 (2001)

Television broadcast stations	1 (2002)

Electrification
Mauritania generates 105 megawatts of electricity. Fossil fuels provide 44 megawatts and hydroelectricity 61 megawatts. About 15% of the Mauritanian population has electricity with 30% in the urban areas and 10% in rural areas. Plans are afoot to provide electricity for 80% of the population in the two major cities of Nouakchott and Nouadhibou. National demand accretion rate is 10% to 15%.

The monopoly that Sonelec *(la Société nationale d'eau et d'électricité*), the national electricity company, enjoyed was abrogated in 1999. Two companies resulted: Somelec (la Société mauritanienne d'électricité) and Ader (L'Agence de développement de l'électrification rurale). Ader is responsible for rural electrification and Somelec handles power generation and distribution.

SNIM (La Société Nationale Industrielle et Minière), also produces 40 megawatts and 8 megawatts of electricity in its mining towns of Zouerat and Nouadhibou respectively.

Mali, Senegal, and Mauritania constructed the Manatali dam on River Senegal. The dam is managed by Sogem[11] (la Société de Gestion de l'Énergie de Manatali) and provides 807 GWh per year to the three countries with Mauritania obtaining 15% of power generated since 2002.

ICT Policies

The government created the State Secretariat for New Information Technologies (Le Secrétariat d'Etat aux Technologies de l'Information et de la Communication) to prepare and promote the national ICT policy.

The formulation of Mauritania's National Information and Communication Infrastructure (NICI) plan started in April 1999.[12] The process was led and co-ordinated by the Science and Technology Faculty of the Université de Nouakchott and the Ministry of Interior and Communications with support from the Internet Initiative for Africa of the UNDP as part of the national NICI team and the Economic Commission for Africa, ECA.

The NICI plan was finalised and approved in March 2000. The plan aims to:

- Integrate the ICT dimension into the realisation of the strategic choices for economic and social development in Mauritania
- Democratise access to ICT
- Contribute to the establishment of mechanisms of good governance
- Position the country to participate in the globalisation process

The plan identifies specific sectors requiring ICT-assisted development:

- Education: national network for learning and research
- Health: national information and communication in health systems
- Public administration: government's national ICT network
- Private sector: trade information and exchange network of Mauritania

To implement the plan effectively, Mauritania established a ministry for the development and promotion of ICTs to oversee the sector. The ministry has embarked on social inclusion strategies for the civil service, the private sector, civil society, and the local communities.

Education Policy
The 1999 educational reforms stipulated the following:

- Unification of the education system and the abolition of the experimental education system that emphasised national language instruction[13] for the first two years of primary education
- Teaching math, the sciences, and computing in French
- Teaching civic education, history, religion, and history in Arabic
- Teaching English and computing at the secondary school level
- Creating a department of national languages at the Université de Nouakchott

Thus, Mauritania emphasises ICT from the secondary education level. It also hopes to eliminate illiteracy in the long term through concerted programmes and activities in the non-formal education (NFE) sector. Four areas of emphasis are targeted:

- Providing more funding and logistics
- Improving the skills and competences of NFE instructors, programme designers, inspectors, and managers
- Improving the programmes and curricula
- Emphasising the role played by *mahadra*, the schools on camel backs, for the nomadic populations in the desert areas

Funds for these activities are being sourced from the Highly Indebted Poor Country (HIPC)[14] programme.

Current ICT Initiatives and Projects

The government preceded the NICI plan with some concrete actions[15] that aided its implementation:

- Establishment of the government Internet centre in the civil service
- Establishment of an independent regulatory body responsible for telecom sector deregulation and the introduction of free competition
- The privatisation of the national operator, Mauritel

- The creation of the State Secretariat for New Technologies (SETN) in the office of the prime minister
- The institution of a legal framework and attractive conditions including the development of a policy regarding access to universal regulated services and the preparation of a telecom development strategy for the rural areas
- Duty waivers on all imports of computer equipment and accessories

The government also embarked on some strategic initiatives to achieve these objectives:

- Development of means of access for all Mauritanians in the information society
- Human resource capacity-building
- Digital modernisation of public institutions and governance
- Adaptation of institutional and legal capacities to new technology contents
- Development and usage of new technologies in the private sector
- Development of Web content and visibility of Mauritania on the Web
- Support for sectoral technologies
- General governance of the new technologies sector

It is worth noting that these initiatives are underway in various public and private sectors. An example is the service offered by Université de Nouakchott in collaboration with AUF:

- e-learning (several certificated courses in this portfolio)
- Web site development and hosting
- Institutional and scientific capacity-building

Currently there are 450 subscribers in both the public and private sector to the services of the Information Access Centre (CAI) of the university in addition to 453 students and researchers.

The government also promoted the creation of an ICT users' network involving 450 associations, NGOs, women's co-operatives, 45 newspapers, and 35 communities.

Implementation

Université de Nouakchott has developed a USD$1,114,000 network[16] development plan, the national education and research network**,** to link all secondary and tertiary educational institutions to the Internet, including tertiary professional institutions that train administrators, health sector professionals, agriculturists, etc. Unfortunately, the plan is hampered by the absence of electric power in most parts of the country.

The university's Science and Technology Faculty (FST) has already initiated the teaching of ICT courses to the public in collaboration with the World Bank, the Agence Universitaire de la Francophonie (AUF), UNESCO, and the Institute for Research and Development.

The ministerial department in charge of secondary education, for its part, has also initiated a project with the FST and the Global Development Network (Reseau Mondial de Developpement) aimed at introducing ICT into public secondary schools in Mauritania.

Further, the government is implementing a reform programme to improve the quality and efficiency of teaching by using ICT. The objectives of the programmes, which derive from the activities of the Université de Nouakchott's FST, are:

- Access to data banks and e-libraries
- Scientific and technical content development for education and research
- Communication between the pupils, students, teaching, and research communities
- Creation of collaborative projects among pupils, students, teachers, and researchers including participation in sub-regional or international projects
- Statistics on educational and research systems
- A directory of personnel in the research and teaching structures

Six secondary schools in the capital are already connected to the FST network. FST envisages connecting all 10 teacher-training institutions in the country and other secondary schools nationwide. Since the plan focuses on education and research, it envisages ICT training for the teachers and researchers in secondary and tertiary education and includes the use of e-learning methods.

Further, the plan involves training a cadre of personnel that will maintain and repair computer systems and networks in the various localities where computer laboratories will be established.

The reduction of Internet access connection costs is a major element in the plan. Consequently ICT components are to be integrated into all telecommunication and electrification expansion plans. The government is also encouraging investment in ICTs.

All civil servants are to undergo ICT training, from beginner to advanced levels, to ensure the application of ICTs in national administration. The country set the targets[17] below for the implementation of ICTs in the civil service and the population at large in 2006:

- Increase the bandwidth from 3.3 Mbps to 100 Mbps
- Connect 216 communities, all hospitals and health centres, and all teacher-training institutions
- Increase teledensity to 5% for fixed lines and by 20% for mobile telephones
- Provide 30 computers for every 100 employees in the civil service (i.e., 7,000 hosts)
- Train 100 computer scientists and computer technicians and pay attractive salaries to computer professionals to minimise the brain drain
- Establish three intranets for education, health, and the civil service
- Establish four portals for the economy, culture and tourism, education, and health sectors

- Establish a pilot secure e-commerce system
- Initiate e-government procedures by providing several government services on-line
- Integrate ICT into all development projects
- Establish an ICT village in Nouakchott
- Adapt existing laws by integrating ICT usage aspects

The Campus Numérique Francophone de Nouakchott[18] in the Université de Nouakchott is staffed by management, computer, and training experts and is contributing to these efforts. The centre provides access to scientific and technical information, Internet communication, and e-learning.

In 2005, Resafad Mauritanie, in collaboration with the Ministry of Education, trained 43 education inspectors and officials in the ministry in beginner, intermediate, and advanced computing. Resafad is the Reseau Africain pour la Formation à Distance.

In 2006,[19] Mauritania allocated licences in the telecom sector to:[20]

- A new mobile operator, Chinguitel Mauritanie S.A.
- Orange Mauritanie S.A., which will operate a platform for pre-paid cards and a link to international telephone services
- Watanya Télécom Mauritanie SA, to construct local telephone circuits and to provide national and international telephone and Internet services

Through the World Links Programme of the World Bank, 12 schools are also involved in 14 collaborative projects involving 215 teachers and 6,000 students. The objective of the programme is to connect schools as communities of learning throughout the world and offer children the opportunity to use ICT creatively. Participating schools are provided free Internet connection. The programme has had a particular impact on Mauritanian women since it provides them the information that would otherwise not have been available within their societies and communities.

Legal and regulatory framework

To ensure the preservation of the potential gains of ICT in the economy, Mauritania plans to provide the necessary institutional and legal framework[21] to protect its nascent ICT industry being championed by the Université de Nouakchott. Among the rights to be protected by law are:

- Appropriate Internet policies including consumer rights, intellectual property rights, and personal privacy
- Cyber crime affecting commercial transactions as well as individual and company rights

To this end, the country will introduce modern tools and build institutional capacity levels to underpin the liberal environment created to ensure the sustenance and promotion of ICT.

Non-formal education
In the non-formal education (NFE) sector, Mauritania has established 500 literacy centres[22] nationwide and trained hundreds of literacy instructors to manage and teach in those centres. The country organises training workshops for would-be instructors who are secondary school graduates. New instructors are given theory and practical lessons on novel methods of adult learning and literacy.

Mauritania encourages women's participation[23] in the adult literacy programmes by locating the centres close to the communities and awarding prizes to female participants. The latest awards in the series were presented by Mauritania's First Lady to 15 female laureates and three journalists recognised as having contributed articles to the promotion of the NFE programmes and women's participation in particular.

Girls' education
Statistics[24] on girls' enrolment shows a high attrition rate of 30.3%. The adult female literacy rate is 27% in the rural areas and 52% in the urban areas.

The following factors[25] have been identified as contributors to the poor performance in examinations and withdrawal of girls from school:

- Extreme poverty of parents
- Distance from home to school
- Domestic chores
- Early marriages
- Social discrimination against girls
- Sexual harassment

Because of these challenges, girls' education has consistently received boosts with each educational reform since 1960. Government efforts at local and national levels include:

- Sensitisation campaigns involving traditional, political, and religious authorities
- Location of schools close to communities
- Employment of women teachers
- Prioritisation of girls' schooling by providing assistance and scholarships to more girls than boys
- Separation and grouping of boys and girls in the classrooms to meet the expectation of conservative parents

Introduction of the above measures increased primary school enrolment from 45.5% (39.3% for girls) in 1989/90 to 86.2% (83.2% for girls) in 1997/98.

Implementing ICT in Education: What Helps and What Hinders?

Table 5 lists the core factors and provides a summary of the current state of development in Mauritania in terms of enabling or constraining ICT applications in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features	Risk Factors
Electricity and telecom infrastructure development	Government policy to integrate Internet and electricity provision in all telecoms and power extension projects	Limited government funds in spite of resources from oil industry	Lack of sustained focus and commitment to planned projects
ICT deployment	Government investment policy and task holidays in the telecom/Internet sectors	• Lack of electricity • Unwillingness of investors to provide Internet access where they cannot recover their investment with profit	
ICT in education	Strategies and targets implementation underway	Access to ICTs limited to secondary and tertiary institutions	• Low levels of enrolment and access to secondary and tertiary education • No-exposure of primary school pupils and the illiterate adult population in the NFE sector to ICTs
Non-formal education	Impressive effort of government to reach nomadic communities on camel-backs with education	• Entrenched traditions and/or discrimination against women • Limited government funds	
Girls' and women's education	Priority given to girls' and women's education in the formal and informal education sectors	Entrenched traditions and sexual discrimination against girls	

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ICT in Education in Mauritius

by Shafika Isaacs
April 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

The findings, interpretations and conclusions expressed herein are entirely those of the author(s) and do not necessarily reflect the view of *info*Dev, the Donors of *info*Dev, the World Bank and its affiliated organizations, the Board of Executive Directors of the World Bank or the governments they represent. The World Bank cannot guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply on the part of the World Bank any judgment of the legal status of any territory or the endorsement or acceptance of such boundaries.

It is expected that individual *Country Reports* from the *Survey of ICT and Education in Africa* will be updated in an iterative process over time based on additional research and feedback received through the *info*Dev web site. For more information, and to suggest modifications to individual *Country Reports*, please see www.infodev.org/ict4edu-Africa.

Overview

Following the model of the Singaporean experience, the Mauritian government has been visionary in its promotion of its country as a "cyber island," a hub for the southern African region with a diversified economy. Mauritius has attempted to promote ICTs in schools since the late 1990s which is reflected in its national ICT policy, a segment of which is dedicated to education.

Country Profile

Mauritius is an island nation with a population of about 1.2 million. Since independence in 1968, the country has grown from a low-income agriculturally based economy to a middle-income diversified economy with growing industrial, financial, and tourist sectors. Since independence, annual growth has been around 5% to 6%, life expectancy has risen, infant mortality has been lowered, and the infrastructure has improved. The GDP was estimated at $16.28 billion for 2005, the second highest per capita in Africa.[2] In 2004 the UNDP classified Mauritius as a high-income country when it ranked 62nd out of 177 countries on the Human Development Index.

Table 1 provides some selected socio-economic indicators for Mauritius.[3]

Table 1: Socio-economic Indicators: Mauritius

Indicator	
Population	1.2 million (2005)
Languages	Official language: English. Other languages: Creole, French, and Bhojpuri.
2005 Economic activity (% of GDP)	Agriculture: 6.1% Industry: 28.1% Services: 65.8%
Human Development Index	62 (out of 177 countries)
Per capita Gross National Income (US dollars)	$5,200 (2005)

The Education System

Mauritius's education system is based largely on the British school system. Education has been free through to the secondary level since 1976 and through to the post-secondary level since 1998. Expenditure in the private Catholic church-controlled confessional

schools has also been subsidised. However, pre-primary schools are still mainly privately owned.

Tertiary education is delivered by a wide range of institutions with diverse characteristics. Some provide all levels of tertiary education in a range of disciplines while others focus their activities on only one or two areas at certain levels. A number of the institutions are overseas with their provisions made available through distance education. Public tertiary education institutions include the University of Mauritius (UoM), the Mauritius Institute of Education (MIE), the Mahatma Gandhi Institute (MGI), and the Mauritius College of the Air (MCA). Overseeing the four tertiary education institutions is the Tertiary Education Commission which is responsible for allocating public funds and fostering, planning, and co-ordinating the development of post-secondary education and training. These tertiary education institutions are geared towards programmes in very limited or specific disciplines.

Two polytechnics, managed by the Technical School Management Trust Fund, also operate within the public sector. They are the Swami Dayanand Institute of Management and the Institut Superieur de Technologie. The Industrial and Vocational Training Board and the Mauritius Institute of Health equally dispense tertiary-level programmes in selected areas.

In addition to these publicly funded institutions, an estimated 35 private institutions and 50 overseas institutions are presently delivering tertiary-level programmes, mostly in niche areas like information technology, law, management, accountancy, and finance. A majority of these private institutions operate on a part-time basis in the evenings, weekends, and on some weekdays with relatively small student cohorts.

The country has 1,070 pre primary schools, 289 primary schools, and 176 secondary schools.

Table 2 provides a quantitative perspective of some selected system indicators.[4]

Table 2: Selected Education Data

Indicator	
Male adult literacy rate 2000-2004	88%
Female adult literacy rate 2000-2004	81%
Male primary enrolment (% of gross)*	102 (2002-2005)
Female primary enrolment (% of gross)*	102 (2002-2005)
Male secondary enrolment (% of gross)*	89 (2002-2005)
Female secondary enrolment (% of gross)*	88 (2002-2005)

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.

Infrastructure

According to the World Economic Forum *Global Information Technology Report*, Mauritius ranks 45th out of 115 economies in terms its network readiness index, which measures the degree of preparation of a nation to participate in and benefit from ICT developments.[5]

Table 3 provides a snapshot of the state of national ICT infrastructure in Mauritius.[6]

Table 3: ICT in Mauritius

Indicator	
Fixed-line subscribers (2004)	287 per 1,000 persons
Mobile subscribers (2004)	505 per 1,000 persons
Dial-up subscribers	30,000
Internet users (2004)	146 per 1,000 persons
Television broadcast stations	2
Radio stations	AM 5; FM 9; shortwave 2

Mauritius is considered to be in the league of top performers in the global economy. The country has accelerated the liberalisation of its telecommunications sector by an early termination of the exclusivity of the incumbent operator as of 1 January 2003. Mauritius was among the 69 signatories to the General Agreement on Trade in Services (GATS) in 1997. In 2001 it introduced the ICT Act which provided the legal framework for liberalisation, and a subsequent amendment in 2002 brought forward the liberalisation in early 2003.

Because of the small geographic size of the country, coverage of telecommunications facilities is easy with all localities having access to telephone services. Almost the entire population is in the range of a cellular phone signal.[7] The high level of universal access is attributed to subsidisation of home telephone costs as well as increase in household incomes which make telephony more affordable.

There are also plans by a local company, ADB Networks, to make Mauritius the first national coast-to-coast hot spot, offering wireless Internet access across the island. Currently only 60% of the island is covered and only 70% of the population has access.[8]

ICT Policies

The Government of Mauritius has actively promoted ICT since 1989. Since then it also proposed a national ICT policy modelled on the Singaporean experience. The Mauritius

strategy involved creating instruments to support the liberalisation of its telecommunications sector, creating an ICT literate workforce, improving the capacity of public institutions to harness ICTs, and positioning Mauritius to be a key player in ICTs by creating enabling environment and robust infrastructure.

In 1989 the government set up four institutions: the National Computer Board, the Central Informatics Bureau, the State Informatics Limited, and the State Informatics Training Centre Limited. The Ministry of Information Technology and Telecommunications deals with the formulation and implementation of government policies in the ICT sector.

The National Information and Communication Technology Strategic Plan (NICTSP)[9] was first adopted in 1998 and was accompanied by the launch of a number of projects in policy formulation, ICT awareness, human resources development, government computerisation, and standard setting. The Mauritius Parliament also passed an Electronic Transaction Act in July 2000 to provide an appropriate legal environment for electronic transactions covering electronic contracts, establishment of certification authorities and standards to combat forgery and fraud in electronic business.

The policy's vision is to make Mauritius a "cyber island" in which ICT would become the fifth pillar of the economy after sugar, textile, tourism and financial services as well as a regional ICT hub.

A revised strategy was approved by the government in February 2006 following a review of the first five years of the NICTSP between 1998 to 2005. This revised strategy revolves around focusing on niche markets in the ICT industry, developing strategic partnerships with ICT leaders, investing in a world-class physical and telecommunications infrastructure, emphasising ICT culture development, providing for an adequate supply of human resources, and establishing a favourable business environment. It has three key focus areas:

- The establishment of an ICT industry comprising the cyber city and business parks supported by telecommunications infrastructure for wealth and job creation
- Attracting and maintaining a high calibre of ICT experts in Mauritius to increase local availability of trained manpower in ICT
- Creating a favourable business environment with a sound legal framework and attractive financial incentives for foreign investors

Current ICT Initiatives and Projects

National Computer Board

The National Computer Board (NCB) was set up in 1988 as the managing agency for the country's national ICT strategy. It is a parastatal body administered by a board of directors and operates under the aegis of the Ministry of Information Technology and Telecommunications. Its vision is to be the key enabler in transforming Mauritius into a

"cyber island" and a regional ICT hub, and its mission is to "e-power people, businesses and the public sector by developing and promoting ICT and ICT-related services."

The NCB oversees a range of projects in education, business and the public sector. These include the following.

Universal ICT EducationProgramme (UIEP)
This programme, approved in March 2006, aims at imparting computer proficiency skills to all students, workers, unemployed people, and the population at large. Through the UIEP, the government is aiming to train 400,000 trainees over four years to obtain the internationally recognised Internet and Computing Core Certification (IC3). This programme would create a significant pool of ICT professionals which, in turn, would attract employers interested in using Mauritius as an ICT bridge between India and Africa and between India and French-speaking countries.

The main objectives of UIEP are to:

- Make an e-society where ICT pervades all spheres of social development and well-being of all Mauritians
- Meet the demand of ICT manpower for the industry
- Align Mauritius to international benchmarking in ICT literacy
- Encourage people to go for higher-level industry-based certifications

The programme delivers an IC3 basic computing skills course in 59 training centres that are situated in schools across Mauritius. The Internet and Computing Core Certification was developed by Certiport Incorporation (US) and is the first globally accepted, standards-based, validated certification programme for basic computing skills. Becoming IC3 certified demonstrates that one possesses the knowledge required for basic use of computer hardware, software, and the Internet, which are nowadays prerequisites for virtually every placement opportunity.

Mauritians who successfully obtain the IC3 certification under UIEP will be able to follow professional ICT courses at a 95% discounted rate. The UIEP aims at imparting computer proficiency skills to over 400 000 persons over the next four years.

For more information: http://www.gov.mu/portal/sites/uieptest

The Cyber Caravan
Launched in November 2000, the Cyber Caravan project aims at making ICT facilities available in the most isolated areas in Mauritius through NCB's Cyber Caravans. The NCB presently operates two Cyber Caravans, which are equipped with nine and 10 PCs respectively and Internet connection. As of 2 March 2007, about 55,700 people had followed ICT literacy and ICT awareness courses.

The main objectives of the Cyber Caravan Project are to:

- Raise the level of knowledge about ICT and the level of competence in using personal computers and common computer applications
- Promote and encourage ICT literacy
- Ensure all computer users understand the advantages of using a personal computer.
- Enhance the employability of all people, to enable them to be part of the global information society

The ICT literacy programmes provided by the Cyber Caravans are customised to meet the needs of all people with few or no ICT skills. These courses are delivered by MQA-registered IT support officers. There are five types of training:

- ICT literacy
- IT Introductory course
- ICT awareness
- ICT awareness programme for children
- Evening ICT awareness

IT Empowerment Programme for the Unemployed

With the widespread us of information technology in businesses, employees at all levels are expected to have a basic knowledge in ICT tools. In this context, the National Computer Board runs a free training programme for unemployed people to empower them with ICT skills with a view to increase their employability.

A training programme of 60 hours' duration, spread over 10 full days is being carried out in the NCB Cyber Caravans. A certificate of attendance is issued to all participants who successfully complete the course.

Community Empowerment Programme

The Community Empowerment Programme (CEP) was introduced with the objective of facilitating the process for the community to make use of ICT to fully participate in the socio-economic development of the country. The CEP is in line with the government programme to encourage the development of local content and creativity.

The programme will provide a common platform for sharing local knowledge and a marketplace for project proposals, discussion forums, and thematic Web directories. It will also enable communities to formulate and implement their own development projects by collaborating with donors and other stakeholders.

ICT Literacy Training for Women

ICT literacy courses are provided to women of different regions across Mauritius after which a certificate of attendance is issued.

ICT Services on Your TV Set

The Mauritius government announced in late 2006 an ICT empowerment programme called ICT Services on Your TV Set which is designed to further empower people to the

use of ICT to improve their knowledge and living standards. The planned launch date is some time in 2007.

This project adds on to numerous ongoing national initiatives aimed at bridging the digital divide. It provides for the transmission of information on government services and other sectors of economic and social activities. The service can at the same time be used as a medium to educate a wide spectrum of the population with specific contents adapted to local needs and requirements.

Schools Projects
The Mauritius Ministry of Education has been involved in the introduction of ICTs in schools since 1991.

School IT Project
The national ICT policy states that IT will be taught in schools as a subject and integrated into teaching across the curriculum in primary and secondary schools. There remains a challenge to promote connectivity in schools and establish a network for information exchange and information in the education sector.[10]

The plan for the Schools IT Project was that all the 277 primary schools in Mauritius would have, at least, a computer laboratory with 21 computers, two printers (one ink-jet colour and one laser black and white), a scanner, a digital camera and a server with a LAN. They would all be connected to a network (SchoolNet) controlled by a powerful central server, based at the ministry, through which Internet connection would be possible and on which server on-line educational resources would be available.

In 2003, approximately 317 computer laboratories (instead of 222 as was initially intended) were needed for the 277 schools on the grounds that 40 overpopulated schools needed two laboratories instead of one. All 5,400 primary school teachers were also targeted to be trained in ICT to be able to use it as a pedagogical tool as of 2006. By the end of 2002, 330 newly recruited ICT teachers had been trained by the Mauritius Institute of Education and had been posted to primary schools.[11]

ICT Competition
With the objective of promoting ICT use as an education instrument, the NCB organises two ICT competitions for secondary- and tertiary-level students each year, namely the School IT Competition and the ICT Project Competition. This year the NCB has revised the scope of the School IT Competition to allow students to participate in an international Web site competition, ThinkQuest.

NEPAD eSchools Mauritius
The New Partnership for Africa's Development (NEPAD) eSchools Initiative is a multi-country, multi-stakeholder, continental initiative that aims to:

- Impart ICT skills to young Africans in primary and secondary schools

- Improve the provision of education in schools through ICT applications and the use of the Internet

The first phase of the initiative is a demonstration (Demo) project that is being implemented by the private-sector partners. The objectives of the Demo project are to:

- Determine typical e-school scenarios and requirements in various circumstances in Africa
- Highlight the challenges inherent in a large-scale implementation of e-schools programmes
- Monitor the effectiveness of multi-country, multi-stakeholder partnerships
- Determine "best practice" and exemplary working models for the large-scale implementation of the NEPAD eSchools Initiative, which aims to equip more than 550,000 African schools with ICTs and connect them to the Internet
- Demonstrate the costs, benefits, appropriateness, and challenges of a satellite-based network
- Demonstrate the costs, benefits, and challenges of ICT use in African schools

The Demo project has been implemented in six schools in each of 16 countries across Africa through partnerships that involve private sector consortia. Mauritius is one of the 16 countries where the Demo project was co-ordinated by a dedicated country liaison person. Cisco and Microsoft are two companies that formed consortia to support the Demo project in six Mauritius high schools where the typical model involved fitting each school with a PC lab comprising approximately 20 PCs, a server and a printer; a media lab, which sometimes included a PC-based kiosk containing health information: and a television with satellite television access to a bouquet of education channels including National Geographic, the History Channel, SABC Africa, and Mindset Learn. Teachers at the six schools received training and learners have subsequently used the PC labs in the classroom.

Tertiary Institutions

There are five institutions that offer courses leading to certificates, diplomas, and degrees in ICT: University of Mauritius, Mauritius Chamber of Commerce and Industry, Swami Dyanand Polytechnic, De Chazal Du Mee Business School, and University of Technology of Mauritius.

The Mauritius Institute of Education (MIE) is the only teacher-training institution in Mauritius. It was set up in 1973 and since then it has been responsible for training primary and secondary school teachers. The MIE has an online facility through which it engages with its students and lecturers (www.mieonline.org).

The University of Mauritius

The University of Mauritius dominates the tertiary education sector locally. In 2003 it established the Life-long Learning Cluster (LLC) which groups three dedicated multi-modal lifelong learning centres: the J. Baguant Centre for Distance Learning, the Virtual Centre for Innovative Learning Technology, and the Centre for Information Technology and Systems. The LLC was set up to:

- Enhance learning, develop flexible learning, and experiment with education delivery systems
- Strengthen the university's role as a provider of distance learning as part of the continuing development of innovative teaching and learning strategies
- Upgrade the centre for distance learning
- Provide more comprehensive opportunities for open and distance learning
- Expand and diversify the range of programmes offered by mixed mode in a phased manner
- Satisfy the existing and emerging needs of non-conventional learners

In this way, the LLC encourages the pooling of human and financial resources to facilitate the design of programmes of study and identify and supervise research projects in ICT and lifelong learning.

Virtual Centre for Innovative Learning Technology

The Virtual Centre for Innovative Learning Technology (VCILT) hosted the 2003 International Conference on Open and Online Learning (ICOOL 2003) in partnership with, among others, the Commonwealth of Learning, the University of La Reunion, Hewlett Foundation, and UNESCO, and during which the VCILT was able to strengthen links with other institutions and organisations both at national and international levels. Further, the Lifelong Learning Cluster (LLC) created in 2003/04 consolidated the existence of the Centre with the view to enabling it to attend to new challenges in the field of technology-enhanced education, e-learning paradigms, and innovative learning. The VCILT also participates on behalf of the University of Mauritius on a Commonwealth of Learning and Hewlett Foundation-supported initiative known as the Virtual University for Small States of the Commonwealth (VUSSC) which aims to build community through collaboration on open content.

VCILT has also developed an e-learning platform, iLearn, to deliver online modules, provide support to conventional classes, and host training programmes to enable lifelong learning. To support the management of learning activities, iLearn offers a panoply of pedagogical tools such as forum, self-assessment, assignments, and submission box facilities, bookmark-gathering, sharing of private space, and a test centre to assess students on modules. The platform allows individuals across borders to communicate and share knowledge and experience from anywhere at anytime through the Internet. The VCILT also developed a multimedia enhancement CD-Rom for teaching and learning history and geography at the primary level and assisted with the development of a bilingual Indian Ocean open learning portal that serves to promote open links internationally, especially among the Indian Ocean islands.

TVET

Mauritius has an Industrial and Vocational Training Board and Technical Board. The board provides incentives to firms to promote in-house training. Firms can claim back 75% of their training costs depending on their tax status. Training may be conducted in house or with a training institution recognised by the Mauritius Qualifications Authority. Grants are based on a cost-sharing principle.[12]

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in Mauritius in terms of enabling or constraining features in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation	Mauritius has been a front runner in an overall comprehensive national ICT policy and liberalised telecommunications framework. The national ICT policy also includes a component on education.	There is no comprehensive policy on ICT in education.
Advocacy leadership	The government has been at the forefront of driving ICT access and use at all levels of society and has implemented projects with ambitious targets.	
Gender equity	The government has introduced a dedicated project promoting the use of ICT by women.	There is no explicit reference to gender equality and women's empowerment in the national ICT policy.
Infrastructure and access	Mauritius has a relatively good ICT infrastructure and high levels of ICT access including Internet connectivity.	
Collaborating mechanisms	The government has instituted some collaborating mechanisms to co-ordinate, monitor, and manage ICT initiatives in the country.	
Fiscal resources	Dedicated budgets have been allocated for various ICT projects that promote the vision of government.	

Attitudes	The leadership of the government has been confident ambitious attitude in the promotion of ICTs as a cornerstone of the economy. The focus appears to be on technical training.	

Notes

1 The World Factbook 2007. https://www.cia.gov/cia/publications/factbook/geos/wa.html
2 Mauritius. Wikipedia. http://en.wikipedia.org/wiki/Mauritius
3 The World Bank. www.worldbank.org
4 Mauritius. UNICEF. http://www.unicef.org/infobycountry/mauritius_statistics.html
5 Global Information Technology Report.
http://www2.weforum.org/site/homepublic.nsf/Content/Global+Competitiveness+Programme/Global+Information+Technology+Report.html
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10 National ICT Strategic Plan, Government of Mauritius and UNDP. 2006.
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11 Ramharai, V. and K. Goodoory. "ICT in Primary Schools in Mauritius, Policy and Practice." ICOOL. 2003. http://66.102.9.104/search?q=cache:rE-Bezf7DQkJ:icool.uom.ac.mu/2003/papers/file/Ramharai.pdf+mauritius+ict+schools&hl=en&ct=clnk&cd=2&gl=za
12 National ICT Strategic Plan, Government of Mauritius and UNDP. 2006.
www.gov.mu/portal/sites/nictsp1/NICTSPReviewed3F.pdf

Given the constantly changing nature of the Internet, we suggest that you copy the document or web site title (and author or organization name, as appropriate) of a resource below into your favorite search engine if a link on this page is not working.

ICT in Education in Morocco

by Amr Hamdy
June 2007

Source*: World Fact Book*[1] *1*

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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Overview

The Moroccan government has realised the key role played by ICT-based education as a positive contributor to the Information Society. Article 10 of the National Charter of Education and Training of 1999 is focused on the integration of ICT in education and supports the acquisition of computing facilities at schools along with the promotion of distance education and learning. Several programmes and initiatives, led and supported by the government, are taking place in the context of a long-term strategy that is intended to cover all education sectors and regions to ensure equal opportunity for all citizens.

Country Profile

The Kingdom of Morocco is situated in North Africa, with a long coast on the Atlantic Ocean that reaches past the Strait of Gibraltar into the Mediterranean Sea. Its climate, geography, and history are all more closely related to the Mediterranean than to the rest of Africa, and for this reason visitors are often struck by the odd sensation of having not quite reached Africa in Morocco.

Morocco, a constitutional monarchy, is the only African country that is not currently a member of the African Union. However, it is a member of the Arab League, Arab Maghreb Union, Organization of the Islamic Conference, Mediterranean Dialogue group, and Group of 77, and it is a major non-NATO ally.

Table 1 provides some selected socio-economic indicators for the country.[2]

Table 1: Socio-economic Indicators: Morocco

Indicator	
Nationality	Moroccan
Ethnic groups	Arab-Berber 99.1%; other 0.7%; Jewish 0.2%
Religions	Muslim 98.7%; Christian 1.1%; Jewish 0.2%
Languages	Arabic (official); Berber dialects; French often the language of business, government, and diplomacy
Population	33.2 million (July 2006 est.)
Population growth rate	1.55% (2006 est.)
Literacy	Male: 64.1% Female: 39.4% Total population: 51.7% (2003 est.)
GDP (US dollars)	$56.72 billion (2006 est.)
GDP per capita (US dollars)	$4,400 (2006 est.)
Labour force	11.25 million (2006 est.)
Unemployment rate	7.7% (2006 est.)
Telephones: main lines in use	1.341 million (2005)
Telephones: mobile cellular	12.393 million (2005)
Radio broadcast	AM 27; FM 25; shortwave 6 (1998)

stations	
Television broadcast stations	35 (plus 66 repeaters) (1995)
Internet users	4.6 million (2005)

The Education System

Since its independence from French colonisation in 1956, Morocco has laid the foundation for the modernisation of the education system with the main goal of "Arabising" the curriculum and faculty as well as increasing access to education. It has made significant strides in education over the past decades. The French model was adopted and Morocco implemented three tracks of education:

- Modern, which is basically the continuation of the French system
- Original, which is basically Koranic
- Technical, to graduate skilled workers

The education system has undergone several reforms in an effort to reduce regional differences in quality and standards and to ensure general access to education throughout the country. In 1963, education became compulsory for Moroccan children between the ages of six through 13.

Education is free in public schools and is organised as follows:

- Basic (or fundamental) education is divided into two cycles of six and three years respectively. The first six-year cycle is taught at primary schools. The second stage of basic education is generally taught at colleges. Based on the grades achieved in the first nine years, students are enrolled at the secondary level to follow general, technical, or professional studies.
- Vocational studies are accessed by students who finish six years of basic education and pass an entrance exam. They attend a two-year course that leads to the Certificate of Professional Training. The students who complete nine years of basic education may join a two-year programme leading to a Diploma of Professional Qualification in an area of specialisation. Those who finish basic and secondary education but do not pass the baccalaureate exam can take a two-year programme that leads to the Diploma of Technician.

ICT Policies

One of the important axes of the educational reform is the integration of ICT into teaching. This reform was implemented by the National Charter of Education and Training of 1999. Article 10 of the Charter is focused on the integration of ICT in education and supporting the acquisition of computing facilities at schools with the promotion of distance education and learning. With the highest political support as well as the collaboration of selected business leaders and representatives of civil society, a national action plan was formulated in December 1998 and finalised in May 1999.

The King announced the period 1999-2009 as the "education decade." The government focused on five key themes that are important for facilitating the role of knowledge in development and for the effective use of ICTs: education, governance, private sector development, e-commerce, and access. These themes formed the basis for the national strategy for ICT development and together were called the e-Maroc plan.[3]

As a result of the enabling policy of the government to spread the use of ICT in all aspects of life in Morocco, a liberalisation and privatisation policy in the telecommunications sector led to the reduction of telecommunications cost and resulted in a rise in the number of cyber cafés and access to computers and Internet, even in small towns. Currently it is estimated that there are 4.6 million Internet users, which represents a 15.2% penetration rate in the population and a 4.5% growth rate since 2000.[4]

Infrastructure

Today with a population of 33 million, of which over 50% are under the age of 24, Morocco has more than 2,200 Internet service providers (ISPs) and cyber cafés and a reasonable communications infrastructure.

The Ministère de l'Education Nationale and the Ministère de l'Enseignement Supérieur, de la Recherche Scientifique et de la Formation des Cadres were involved in networking the academic institutions. A total of 14 universities and higher education institutions have been connected to the Internet via an X.25 gateway operated by Morocco Trade and Development Services in Rabat with support from USAID.[5]

Tables 2, 3, and 4 provide a snapshot of the state of national ICT infrastructure in the education system.

Table 2: ICT as of January 2005[6]

Indicator	Primary Schools	Middle Schools	High Schools	Training Centres
Number of institutions	6,788 schools 13,049 satellite schools	1,206	615	56
Computer-equipped	4.5% (320 schools)	70% (960 schools)	100%	100%
Internet connection	4.5% (320 schools)	20% (240 schools)	80% (500 schools)	100%
Trained personnel	1% (1,500 teachers)	13.5% (7,200 teachers)	9% (3,200 teachers)	100%

Table 3: Timetable for Equipping Schools[7]

	2004	2005	2006	2007	Total
High school	3,000	4,000	4,000	4,000	15,000
Middle school	4,000	8,000	8,000	8,000	28,000
Primary school		30,000	30,000	30,000	90,000
Total	7,000	42,000	42,000	42,000	133,000

Table 4: Timetable for Teacher Training[8]

Level of instruction	Total number of teachers	Training year				
		2004	2005	2006	2007	Total
High school	35,000	10,000	9,000	8,000	7,000	34,000
Middle school	55,202	15,000	14,000	11,000	7,000	47,000
Primary school	135,663	5,000	7,000	11,000	30,000	39,000
	225,865	30,000	30,000	30,000	30,000	120,000

Current ICT Initiatives and Projects

Table 5 summarises the current and recent ICT initiatives and projects in Morocco.

Table 5: ICT Initiatives and Projects

Programme	Description
GENIE	In March 2005, the Moroccan government adopted a strategy having as its main objective the generalisation of ICT in all public schools with the aim of improving the quality of teaching. This three-year programme will cost about $11 million and aims at providing schools (over 8,600 schools and high schools) with Internet-connected multimedia rooms by 2008. Infrastructure, teacher training, and the development of pedagogical content are part of this national programme which the King officially launched on September 15, 2005. USAID supports this programme through the Last Mile Initiative, which provides multimedia centres in rural middle schools and teacher training in four regions of the country. The GENIE project is built around three complementary axes: • **ICT equipment**: GENIE plans to equip all Moroccan schools with computer labs with ADSL Internet access. It is estimated that 104,000 computers over three years (2005-2008), plus additional equipments like printers and scanners, will be provided. The management of GENIE is placed on a steering committee chaired by the prime minister. A project team was created to follow the implementation of GENIE programme.

	• **Teachers' and school administrators' training**: The training axis in the GENIE project is carried out in close collaboration with several international partners. To implement the training components, regional computer labs have been set up in the 16 regional academies affiliated to the Ministry of Education. The components include: o Training in basic use of computers for 230,000 teachers and school administrators o Training in the use of ICT as a pedagogical tool to more than 18,000 teachers o Training in maintenance to more than 700 technicians o Special training in school management **Curriculum development**: The curriculum development axis includes installing a national laboratory for the development of educational content and installing a national educational portal. The portal will offer several services such as educational resources, discussion forums, e-mail addresses to all teachers, a virtual library, and educational search engines.
Marwan Project	Morocco Wide Area Network was launched in 1997 and activated in 2002. Its main objective is to ensure low-cost access to the Internet for Moroccan universities, to establish a network hosted within universities and administrated by dedicated staff, and to provide a scalable architecture and large bandwidth.
Higher Education Programmes	
CVM	The Moroccan Virtual Campus which was launched in 2002. Its mission is to build and promote synergies between the various e-learning projects within Moroccan universities, enable students to choose their study location and time, enforce the educational content quality, offer scalability to teaching and learning (individualised programmes), facilitate knowledge access, and raise the degree of responsibility of students.
CATT	Computer Assisted Teacher Training was implemented in 1999 with the support of the USAID, with the objectives of equipping CFIs, creating networks of seven CFIs, training 70 instructors and 490 teachers, and developing a community Web site. (www.ibtekar.edu.mc)
Collaborative Learning Programmes	
CIVICS	Community Voices Collaborative Solutions is a project for English-language educators from Algeria, Egypt, India, Jordan, Lebanon, Morocco, Pakistan, Sri Lanka, and Tunisia who are participating in iEARN projects that focus on issues of civic education. The iEARN CIVICS project: • Provides a model for civic education and content-based English as a second/foreign language using iEARN professional development resources and methodologies • Integrates educators in the Near East, North Africa and South Asia into iEARN projects • Creates safe and nurturing environments for students and educators in these regions to address civic education issues relevant to their communities[9]
BRIDGE	The goals of the BRIDGE (Building Respect through Internet

	Dialogue and Global Education) project are to: • Generate dynamic and meaningful dialogue between educators and students in the US and countries with large Muslim populations that lead to long-term personal and institutional ties and continuing face-to-face exchanges to promote mutual understanding • Enhance the use of the Internet in schools in developing educational materials and methodologies that will benefit schools in teaching language, geography, social studies, and culture. • Develop tools and a climate for discussing differing points of view, overcoming suspicion and avoiding and resolving conflict; to promote greater awareness from parents and community members about the benefits of Internet-based collaboration and face-to-face exchanges of educators and students • Generate tangible products as an outcome of the collaborative projects. (www.thebridgeproject.org)
ALEF	ALEF (Advancing Learning and Employability for a Better Future) is an educational project funded by the USAID American Agency for International Development. ALEF is a three-year project managed by a consortium of organisations and lead by the Academy for Educational Development (AED). (www.alef.ma)
MAF	MAF (Mtandao Afrika) is a collaborative programme for young people to form teams and develop educational Web sites. It is implemented in collaboration with SchoolNet Africa and AGENT Consulting.

Implementing ICT in Education: What Helps and What Hinders?

There are no major constraints facing Morocco, but the government is seeking innovative solutions and private-public partnerships to put in place the pilot projects in the different priority themes. The government has to combine the efforts of all development shareholders to promote the active use of knowledge for development and to take advantage of ICTs to facilitate information sharing, communication, new applications of technology, and to foster democracy and moralisation of public life using ICT as the major tool.

Notes

1 The World Factbook 2007. https://www.cia.gov/cia/publications/factbook/geos/mo.html
2 Ibid.
[3] Mots du Ministre Missions Textes Juridiques An2000 Plan Quinquennal Projets Manifestations Contacts Liens Forum home- Plan Quinquennal 1999-2003. United Nations Economic Commission for Africa (UNECA).
http://www.uneca.org/aisi/nici/Documents/Maroc%20NICI%20Country%20Plan.doc
4 Algeria Internet Usage and Marketing Report. Internet World Stats.
http://www.internetworldstats.com/af/dz.htm
5 Morocco News. USAID. 2005. www.usaid.gov/ma/news/sept05.html
6 Technologies for Education for All: Possibilities and Prospects in the Arab World. Hamid Behaj.

January 2005. http://www.uneca.org/aisi/NICI/country_profiles/Morocco/morocinfra.htm
7 Moroccan Education and Resource Network. www.mearn.org
8 Country profile: Morocco. UNECA.
http://www.uneca.org/aisi/NICI/country_profiles/Morocco/morocinfra.htm
9 Community Voices Collaborative Solutions (CIVICS). http://www.iearn.org/civics/

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ICT in Education in Mozambique

by Shafika Isaacs
April 2007

Source: *World Fact Book*[1]

Please note:

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Overview

Mozambique's economy has grown at a steady pace since the end of 1992, following 16 years of civil war. Its education system has also improved markedly with steady increases in school enrolment, even though the numbers of qualified teachers have not kept pace. Mozambique has also been in the lead in southern Africa in developing a national ICT policy and implementation strategy with dedicated programmes such as SchoolNet Mozambique and the Mozambican ICT Institute (MICTI), which serve as flagship projects in the use of ICTs to facilitate and support learning and skill development in the country.

Country Profile

In 1992 Mozambique was listed as the poorest country in the world with a GDP per capita of USD$80. Since then Mozambique's economy has grown steadily, with an average rate of 9% between 1997 and 2003. During the same period, the proportion of Mozambicans living below the poverty line fell from 69% to 54%, exceeding the goals set out in the government's first Poverty Reduction Strategy. Despite the impressive economic recovery, Mozambique is still among the world's 20 poorest countries.

Table 1 provides a brief overview of the basic socio-economic indicators for the country.

Table 1: Basic Economic Indicators: Mozambique

Indicator	
Population	19.5 million (2005)
Languages	Official language: Portuguese. Other languages: Emakhuwa, Xichangana, Elomwe, Cisena, Echuwabo.
2005 Economic activity (% of GDP)	Agriculture: 23.2% Industry: 30.0% Services: 46.8%
Human Development Index	168 (out of 177 countries) (2005)
Per capita gross national income (US dollars)	$230 (2004); $270 (2004); $310 (2005)

The Mozambican economy is based on agriculture with more than 70% of the population living in rural areas, working mainly in farming, forestry and fisheries. Half of the population is aged between six and 24 and women are in the majority. Almost 80% of public investment is earmarked for the social sector (education, health and water supply), and for agriculture, transport, and rural infrastructure.

The Education System

The Ministry of Education administers primary and secondary education and the Ministry of Higher Education Science and Technology has administered higher education institutions since 2000.

Formal education comprises a 5-2-3-2 system:

- Five years of lower primary education (known as EP1 which runs from Grades 1 to 5)
- Two years of upper primary education (known as EP2 which includes Grades 6 and 7)
- Three years of secondary education first cycle (known as ES1 which runs from Grades 8 to 10)
- Two years of secondary education second cycle (known as ES2 which includes Grades 11 and 12)

Under the current curricular transformation, the government vision is that the two levels of primary will gradually merge.

Education is compulsory at age six. Primary schools operate on two or three shifts depending on the region. Two types of study plans are established with different amounts of time and to ensure compliance with the curriculum.

Higher education takes place in both public and private institutions. Technical and professional education is taught at technical schools and institutes offering courses in three major areas (commercial, agricultural and industrial) at elementary, basic, and medium levels.[2]

Challenges

While enrolment has increased over the years, the recruitment of teachers has failed to keep pace. The ration of pupils to teachers in EP1 increased from 61:1 in 1997 to 66:1 in 2003. Since signing the peace accords in 1992, student enrolment (EP1 and EP2) increased in absolute numbers from 1.3 million to 3.2 million in 2003 while the number of schools increased from 2,836 to 8,418.[3]

About half of lower primary school teachers do not have formal teacher training, and double- or triple-shift teaching has been introduced to cope with the shortage of classrooms and teachers. And despite the considerable effort to rebuild and expand access to schooling, population data indicate that one million school-age children remain out of school. Of these, an estimated 650,000 are of primary school age. In 2004, only 28% of girls and 40% of boys completed primary school.[4]

Child poverty is a pervasive and deep-rooted problem, with about 58% of children living below the poverty line. One of Mozambique's biggest challenges is to translate its economic gains into improved child and maternal health and well-being over the medium and longer term.

The HIV/AIDS epidemic is less severe in Mozambique compared with the rest of southern Africa, but the consequences of the epidemic are still devastating. The National Statistics Institute estimates that the infection rate for all Mozambicans is 15%, and more than two million citizens are expected to die of AIDS in the coming decade. HIV/AIDS has two main consequences for the basic education system. First, it has deeply damaged the lives of many children, some of whom are now caring for infected relatives, and many who have lost their parents. Some students are themselves infected. Second, it has infected many teachers and other young adults, whose deaths will exacerbate an already critical shortage of teachers in the basic education system.[5]

Out of the country's 1.6 million orphans in 2006, more than 380,000 had lost their parents to AIDS-related illnesses. As parents continue to die, the number of orphaned children is predicted to rise to 626,000 by 2010. Life expectancy is also expected to fall from 37.1 years in 2006 to 35.9 years by 2010.[6]

Infrastructure

According to the World Economic Forum *Global Information Technology Report*, Mozambique ranks 101st out of 115 economies using the Networked Readiness Index (NRI) which measures the degree of preparation of a nation or community to participate in and benefit from ICT developments.[7] Most of Mozambique's infrastructure is concentrated in the capital city Maputo.

Table 2 below provides an overview of Mozambique's ICT infrastructure.[8,9]

Table 2: ICT Infrastructure Indicators

Indicator	
Fixed-line subscribers (2004)	69.7 per 1,000 persons
Mobile subscribers	708 per 1,000persons
Dial-up subscribers (2005)	6,000 (www.afridigital.net)
Broadband subscribers (2004)	0.0
Internet users (2004)	7.167
Television broadcast stations	1
Radio stations	41

Telecommunication costs remain very high due to internal and external communication relying on satellite links. Cell phone and Internet access is growing at an estimated 67% per annum although the access rate in Mozambique in general remains low[10] due to high Internet prices. Residential and broadband Internet access is available now in Mozambique, compared to 2004.

Mozambique also has a small but growing number of community radio stations which use local indigenous languages as a communication medium.[11]

Electricity is available in the capital city, Maputo, and in the provincial capitals. However the reliability and quality of electricity has been poor with power outages, voltage control, spikes and noise causing irregular access to electric power. Approximately 20% to 30% of schools that have access to ICTs are based in areas with no regular access to electricity.[12]

ICT Policies

The Government of Mozambique's primary policy goal is to reduce absolute poverty within 10 years. It adopted an Action Plan for the Reduction of Absolute Poverty (PARPA) for 2001-2005 and an Education Sector Strategic Plan (ESSP) for 1999-2003, which was revised for 2004-2008. The main objectives of PARPA and ESSP are to:

- Provide universal primary schooling and improve the quality and efficiency of teaching.
- Increase the number and quality of teachers
- Build additional classrooms and address gender disparities
- Increase girls' access to education and also increase the transition rate from EP1 to EP2, while reducing drop-out rates
- Reduce high rates of illiteracy, particularly in rural areas
- Reduce repetition and drop-out rates
- Expand access to secondary education
- Expand access to technical-vocational training
- Continue with investment in training of more and better teachers
- Carry out specific measures as part of its national AIDS programme

A second Poverty Reduction Strategy Paper (PARPA II) for 2006-2009 has a special focus on ICTs within various dimensions of its strategy to reduce poverty.[13]

In 1998, the government established a dedicated National ICT Policy Commission that facilitated the adoption of a national ICT policy in 2000 as an extension of its PARPA strategy. In doing so, Mozambique ranked among the first countries in southern Africa to adopt a national ICT policy.

The key objectives of the national ICT policy include:

- Considering ICTs as a contribution to the fight against poverty
- Expanding citizens' access to global knowledge
- Raising the efficiency and effectiveness of state institutions
- Improving governance and administration
- Transforming Mozambique into a producer and not just a consumer of ICTs
- Linking Mozambique into the global information society

Education, human resource development, health, universal access, national ICT infrastructure, and governance are the ICT policy priority areas.

Since 1998 the National ICT Policy Commission has established an implementation strategy that was adopted in 2002. A technical implementation unit (UTICT) was established within the ICT Policy Commission to oversee the implementation of strategic projects.[14]

Current ICT Initiatives and Projects: Schools

SchoolNet Mozambique

The history of SchoolNet Mozambique dates back to 1997 when it was established as a pilot project named Internet para as Escolas (Internet for Schools) which aimed to introduce computer literacy into 10 secondary schools, explore the integration of ICTs in the teaching process, encourage schools to become centres of information sharing and communication, provide training opportunities, and promote the use of e-mail and Internet access as well as the exchange of experience within the southern Africa region. This pilot project was supported by the International Development Research Centre (IDRC) and the World Bank Institute's World Links Program.

In 2002 SchoolNet Mozambique was launched as an in-house project of the Ministry of Education and was envisaged as a flagship of the National ICT Policy Implementation Plan. One of the central aims of SchoolNet Mozambique is the promotion of access to ICTs in all of Mozambique's secondary schools in order to enhance learning and teaching. Its targets include the need to reach 200 schools within three years and to establish an education portal and a Mozambican teachers' network.

Since its official launch, SchoolNet Mozambique, through the Ministry of Education, secured initial support from the IDRC. Later additional support was provided through partnerships with agencies such as TV Cabo, a local television company; TDM, the local telecommunications company; Computer Aid International; OSISA; SchoolNet Africa; and World Computer Exchange. OSISA and SchoolNet Africa supported the establishment of a technical services centre based at the Industrial Institute Maputo to refurbish and deploy of second-hand PCs to schools. Other agencies such as Computer Aid International and World Computer Exchange helped source the second-hand PCs.

Of the 280 secondary schools, SchoolNet Mozambique was instrumental in facilitating the establishment of PC labs in 75 schools by July 2006 with an estimated 25 schools connected to the Internet.[15]

For more information: www.mined.gov.mz/schoolnet

NEPAD eSchools Mozambique

The New Partnership for Africa's Development (NEPAD) eSchools Initiative is a multi-country, multi-stakeholder, continental initiative that aims to:

- Impart ICT skills to young Africans in primary and secondary schools
- Improve the provision of education in schools through ICT applications and the use of the Internet

The first phase of the initiative is a demonstration (demo) project that is being implemented by the private sector partners. The objectives of the demo project are to:

- Determine typical e-school scenarios and requirements in various circumstances in Africa
- Highlight the challenges inherent in a large-scale implementation of e-school programmes
- Monitor the effectiveness of multi-country, multi-stakeholder partnerships
- Determine "best practice" and exemplary working models for the large-scale implementation of the NEPAD e-Schools Initiative, which aims to equip more than 550,000 African schools with ICTs and connect them to the Internet
- Demonstrate the costs, benefits, appropriateness, and challenges of a satellite-based network
- Demonstrate the costs, benefits, and challenges of ICT use in African schools

The demo project has been implemented in six schools in each of 16 countries across Africa through partnerships that involve private sector consortia. Mozambique is one of the 16 countries where the demo project was co-ordinated by a dedicated country liaison person (CLP) based at the Ministry of Education and within the SchoolNet Mozambique project. Hewlett Packard and Microsoft are two companies that formed consortia to support the demo project in six Mozambican secondary schools where the typical model involved fitting each school with a lab comprising approximately 20 PCs, a server, a printer, and a media lab in some instances which included a PC-based kiosk containing health information and a television with satellite television access to education channels. Teachers at the six schools were to receive training and learners are meant to use the PC labs in the classroom.

The demo project was reportedly still ongoing in Mozambique at the time of writing.

EPCI

This project was established initially as a pilot in 2000, based at Emília Daússe Secondary School, situated in Inhambane City, the capital of Inhambane Province, known at the time to be the second-poorest province of Mozambique. EPCI's principal aim was to provide students, teachers, and the local community with access to ICTs. Within the school, ICTs would contribute to improving the quality of teaching and learning and support the school's administrative and financial management systems. To increase teacher and student interest in ICTs and to provide a framework for their learning to apply ICTs to real situations, the project designed a series of sub-projects involving groups of students and teachers around themes such as the environment and traditional practices. Within these sub-projects students and teachers conducted research, established partnerships with government and private institutions, and developed products and

services in support of the community and the provincial economy. For example, one sub-project involved developing skills in the translation of Portuguese and English. The students and teachers established a partnership with a professional translator and developed skills in using translation software and evaluated its merits using e-mail and the Internet to source translation work as well as word processing skills to produce high quality documents.

The project also served as a public access point for Internet and e-mail access, training in ICT use, graphics, fax and photocopying services, scanning, CD writing, digital photography, and data projection facilities. It was set up as a Research and Information Technology Centre. However, as a way of promoting ICTs as tools for providing good governance and encouraging accountability, transparency, and anti-corruption measures within the State, EPCI developed partnerships with the provincial government offices, the government's district administration offices in Massinga and Jangamo (in the centre and south of the province respectively), and the provincial Education Department.

The Research and Information Technology Centre is now a reference point in Inhambane City. It trains the future workforce and those aspiring to go on to higher education. It promotes the use of ICTs through local NGOs and the community. As the implementation of ICTs is a government priority, many of the local civil servants are taking courses at the centre to gain the skills now demanded of them.[16]

Current ICT Initiatives and Projects: Higher Education

While public and private post-secondary education institutions provide bachelor's-level training in computer science, these are reportedly insufficient in developing the requisite skills in software and application development in the labour market.

CIEUM
The Centre for Informatics at the University Eduardo Mondlane (CIEUM) played a pioneering role in introducing ICTs for development in Mozambique. It served as the home for a number of pilot projects during the late 1990s including telecentres and schoolnets and has evolved as a leading agency in promoting the development of Mozambique's national ICT policy and implementation strategy. Recently the CIEUM facilitated the establishment of MICTI (see below).

For more information: www.cieum.org.mz

ISCETEM
Instituto Superiour de Ciencias e Tecnologia de Mocambique (ISCETEM) is considered the best private post-secondary ICT school in Mozambique. It has a computer science programme that it is currently being revised to accommodate the needs of the labour market in skills development.

MICTI

The Mozambique Information and Communication Technology Institute (MICTI) is a multifaceted initiative aimed at addressing the challenges of skills shortage, post-secondary education and a weak ICT sector. MICTI aims, through ICT applications and research, to serve broader governance, social services delivery, and economic development needs of the country. It has several components including learning, research, and technology. The long-term goal is to place the institute and job incubation activities into a science park environment.

For more information: www.micti.co.mz

MoReNeT
Mozambique Research and Education Network was announced in 2006 to be established and sponsored by the Ministry of Science and Technology. MoReNet will serve to link 25 education and research institutions in Mozambique and will reportedly have the support of fibre-optic operators in an attempt to improve the speed and quality of Internet access to the education and research institutions. MoReNet will serve to build collaboration between research institutions within Mozambique and between Mozambican institutions and those based in other countries across the world. The focus is to allow the sharing of resources such as research journals and courseware.[17]

Current ICT Initiatives and Projects: TVET, ABET and Informal

Community multimedia centres
Supported by UNESCO, the merger of telecentres and community radio stations in Mozambique have led to the establishment of eight community multimedia centres in Mozambique with more planned for the coming period.

Telecentres Networking and Services Development
Based at the CIEUM, the Telecentres Networking and Services Development project started in May 2002 and aimed to consolidate the existing and planned telecentre initiatives led by CIUEM into a coherent and technically supported public access system to further the objectives of the ICT Policy Implementation Strategy. The project activities included the preparation of premises, buying and installing equipment, and managing the telecentre services over four years. The telecentre staff were recruited locally and trained by CIUEM.

For more information: www.telecentros.org.mz

Women's Information, Education and Networking via the Internet
This small project was run from an organisation called Forum Mulher, which developed a Web site as a mechanism to collect, store, and facilitate wider distribution of printed information pertaining to gender issues (especially violence against women) to a network of 50 gender-related NGOs within Mozambique and thus to their membership of community women. Training for some member NGO personnel on ICTs was carried out in the various telecentre areas.

For more information: www.forumulher.org.mz

Implementing ICT in Education: What Helps and What Hinders?

Table 3 provides a summary of the current stage of ICT development in Mozambique in terms of enabling or constraining features in the education system.

Table 3: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation	Mozambique has a national ICT policy that incorporates the education sector; a dedicated national ICT Policy Commission and an implementation strategy.	
Advocacy leadership	The ICT Policy Commission played an instrumental role in facilitating the development of the national ICT policy and its implementation strategy and constituted a core team of ICT champions in Mozambique.	
Gender equity	The national ICT policy explicitly recognises the role ICTs can play in promoting gender equality and women's empowerment. The implementation plan included support for dedicated women's empowerment organisations such as Forhum Muller.	
Infrastructure and access	Infrastructure and access has improved since the adoption of the national policy.	Infrastructure and access remains weak and largely confined to Maputo, the capital city.
Collaborating mechanisms	The National ICT Policy Commission's role is to encourage collaboration across the different ministries as well as with the private, civil society and donor sectors.	
Human resource capacity	The establishment of MICTI serves to address the long-term and strategic development of human resource capacity in ICTs in Mozambique.	There remains a very limited layer of skilled personnel and champions at the national level concentrated around a network of skilled engineers and personnel developed at the CIEUM.

Fiscal resources		The budget for the implementation of ICT programmes in Mozambique remains largely dependent on donor and private sector funds.
Learning content		Local contextually relevant learning content is currently lacking although there have been attempts at localising content produced in Brazil.
Procurement regulations		The duties and taxes currently levied on ICT products makes them too expensive.
Attitudes	Within government leadership is strong and a positive attitude in favour of the promotion of ICTs for development in general and in education in particular.	

Notes

1 The World Factbook 2007. https://www.cia.gov/cia/publications/factbook/geos/mz.html
2 Mozambique. http://www.eaie.nl/pdf/torino/905.pdf.
3 "Introducing the use of ICTs in Education." 2004. Ministry of Education Mozambique. http://72.14.203.104/search?q=cache:UUrVjiFBkbYJ:www.mec.gov.mz/documento.php%3Fid%3D27+schoolnet+mozambique&hl=en&ct=clnk&cd=9&gl=za
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7 Global Information Technology Report. 2003. http://www2.weforum.org/site/homepublic.nsf/Content/Global+Competitiveness+Programme/Global+Information+Technology+Report.html
8 Southwood, R. "Assessing Consumer Activity in the Telecoms and Internet sectors in Africa. IDRC. www.afridigital.net/downloads/IDRCconsumerdftV2.doc
9 The World Factbook 2007. https://www.cia.gov/cia/publications/factbook/geos/mz.html
10 "A Country ICT Survey of Mozambique." 2006. Greenberg ICT Services, SIDA. Stockholm, Sweden.
11 Ibid.
12 Ibid.
13 Ibid.
14 Ibid.
15 Ibid.
16 IDRC Acacia: Mozambique. www.idrc.ca/acacia/mozambique
17 "A Country ICT Survey of Mozambique." 2006. Greenberg ICT Services, SIDA. Stockholm, Sweden.

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ICT in Education in Namibia

by Shafika Isaacs
April 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

The findings, interpretations and conclusions expressed herein are entirely those of the author(s) and do not necessarily reflect the view of *info*Dev, the Donors of *info*Dev, the World Bank and its affiliated organizations, the Board of Executive Directors of the World Bank or the governments they represent. The World Bank cannot guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply on the part of the World Bank any judgment of the legal status of any territory or the endorsement or acceptance of such boundaries.

It is expected that individual *Country Reports* from the *Survey of ICT and Education in Africa* will be updated in an iterative process over time based on additional research and feedback received through the *info*Dev web site. For more information, and to suggest modifications to individual *Country Reports*, please see www.infodev.org/ict4edu-Africa.

Overview

Namibia has played a pioneering and visionary role in Africa in the area of ICTs in education and serves as a beacon for many organisations and groups operating across the continent. Namibia offers innovative options on affordable and sustainable access to ICTs through the active involvement of local youth under the leadership of SchoolNet Namibia. In addition to a visionary national ICT for education policy, the Namibian government has also taken the lead in committing a dedicated budget to support ICTs in education and the establishment of machinery for co-ordinated multi-stakeholder collaboration.

Country Profile

Namibia is one of the world's most sparsely populated countries with a population of just over two million people living in an area slightly over half the size of Alaska which is 825,418 square kilometres. It has among the highest per capita income in sub-Saharan Africa, but that income is unequally distributed. A 2000 survey of the Namibia labour force estimated the unemployment rate at 34% using the broad measure of unemployment nationwide. This high rate is partly attributed to exports of unprocessed primary products and the low levels of education among the economically active population.

Table 1 provides some selected socio-economic indicators for Namibia.

Table 1: Socio-economic Indicators: Namibia

Indicator	
Population (2005)	2 million
Languages	Official language: English. Afrikaans is the common language of most of the population and about 60% of the white population. Other languages: German and indigenous languages (Oshivambo, Herero, Nama).
Human Development Index	125 (out of 177 countries)
Per capita Gross National Income (US dollars)	$2,990 (2005)

Namibia's economy relies heavily on the extraction and processing of minerals as well as on processed fish for export. Namibia is the world's fifth-largest producer of uranium and a primary source of gem-quality diamonds. Cattle and sheep-raising dominate agriculture, and the country has one of the richest potential fisheries in the world. Policies adopted since independence have been aimed at sustaining economic growth, diversifying the country's productive base, and attracting foreign investors.

The Education System

Since gaining independence from South Africa in 1990, Namibia's education system has undergone extraordinary transformation from servicing a privileged few to one involving all learners in integrated classrooms.

Namibia's school education system begins with primary education that lasts for seven years, divided into lower primary (four years) and upper primary (three years). Junior secondary education lasts for three years and leads to the Namibian Junior Secondary Certificate. Admission to senior secondary education is based on the six best subjects in the Junior Secondary Certificate. Senior secondary education lasts for two years and leads to the International General Certificate of Secondary Education (IGCSE) which gives access to higher education. Vocational training centres (VTCs) offer technical subjects at the junior secondary level with options in bricklaying and plastering, electricity, motor mechanics, metalwork, welding, and woodwork.

Higher education is mainly provided by the University of Namibia, the Polytechnic of Namibia, colleges of education, and colleges of agriculture.

Namibia has about 19,000 teachers educating around 550,000 children in 1,550 schools. There are seven VTCs, four colleges of education, three agricultural training colleges, and one police training college. In addition, the Namibian College of Open Learning and private colleges like Damelin and the Higher Education Institute offer a variety of programmes in collaboration with other institutions.

Table 2 provides a quantitative perspective of some selected system indicators.[2]

Table 2: Selected Education Data

Indicator	
Enrolment in primary education (% gross)*	101 (2004)
Enrolment in secondary education (% gross)*	58 (2004)
Transition to secondary	88 (2003)
Enrolment to tertiary education (% gross)*	6 (2004)
Gender Parity Index (GPI)**	1.01 in primary; 1.14 in secondary; 1.15 at university (2004)
Adult literacy male[3]	87% (2000-2004)
Adult literacy female	83% (2000-2004)

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**GPI = gross enrolment ratio (GER) of females, divided by the GER of males and indicates the level of access by females to education compared to males. Namibia demonstrates gender parity at primary secondary and university levels.

A recent World Bank report on Namibia's education found that it was not meeting the needs of the country's economy and was "ineffective." It also found that Namibia's lack of early childhood development resulted in 80% of children entering Grade 1 without the

required level of learning readiness, while 60% of primary school teachers and 30% of secondary school teachers were unqualified. Of those teachers who are qualified, a large proportion lack essential competencies, such as mastery of their teaching subjects, good English proficiency, reading skills, curriculum interpretation, and setting student tests.[4]

The World Bank study also found that curricula were overloaded with too many subjects that lacked clear standards, there was a shortage of schoolbooks, and 21% of all schools had no permanent classrooms. As well, just a third of children enrolled in Grade 1 eventually completed senior secondary school (Grade 12).[5]

Infrastructure

According to the World Economic Forum *Global Information Technology Report*, Namibia ranks 78th out of 115 economies using the networked readiness index (NRI) which measures the degree of preparation of a nation to participate in and benefit from ICT developments.[6] Namibia's rank is ahead of Uganda, Nigeria, Mali, Mozambique, and Zimbabwe.

Table 3 below provides a brief snapshot of Namibia's ICT infrastructure[7,8]

Table 3: ICT Infrastructure in Namibia

Indicator	
Fixed-line subscribers	127,900 (2004)
Mobile subscribers	495,000 (2005)
Internet users	75,000 (2004)
Television broadcast stations	8 (plus about 20 low power repeaters (1997)
Radio stations	AM 2; FM 39; shortwave 4 (2001)

Namibia's close economic and historical links to South Africa means that its telecom market is one of the most developed on the continent. Its modern, fully digital telecom network has helped to drive growth in the Internet and mobile telephony sectors. While mobile and fixed-line services are still a monopoly, plans are underway to introduce competition in both sub-sectors. The Internet sector is open to competition, although the telecoms industry in general ranks comparatively low in terms of openness of the telecommunications market.

The Telecommunications Policy and Regulatory Framework (1999) describes a vision of universal access and liberalisation of the telecommunications sector. The draft Telecommunications Bill provides for the regulation of telecommunication activities including the use and allocation of radio spectrum and the establishment of an independent Namibian Communications Authority. The Bill's aim of universal access is

pivotal to Namibia's vision, and a universal service fund (USF) will be established and administered by the regulator. The existing telecommunications regulatory framework provides for a universal service obligation (USO) by the monopolies.

The liberalisation of the telecommunications sector will introduce competition as a means of accelerating infrastructure development, increasing efficiency, and diversifying services, thereby making government's decentralisation efforts cheaper and increasing Namibia's attractiveness for foreign investment.

ICT Policies

Vision 2030

The Namibian Government developed Vision 2030 as its national plan to "improve the quality of life of the people of Namibia to the level of their counterparts in the developed world by 2030." The policy aims to transform Namibia into a healthy and food-secure nation, in which all preventable, infectious, and parasitic diseases (including HIV/AIDS) are under control, and where people enjoy a high standard of living, good quality life, and have access to quality education, health, and other vital services. All of these aspirations translate into a long life expectancy and sustainable population growth.

In support of the objectives of 2030, capacity-building will be pursued by both the private and public sectors and will continue to be promoted by the existence of a suitable enabling environment in terms of political stability and freedom, a sound legal system, economic resources and opportunities, and social norms that are conducive to sustained development.

As required by Vision 2030, the country will operate a totally integrated, unified, flexible, and high-quality education and training system that prepares Namibian learners to take advantage of a rapidly changing global environment, including developments in science and technology. Arising from the overall capacity-building investments, Namibia will be transformed into a knowledge-based society.

ETSIP

Namibia has also devised a bold 15-year improvement plan for education known as the Education and Training Sector Improvement Plan (ETSIP). The main aims of ETSIP include the following:

- Improving the quality of general education from Grades 1 to 12, which includes curriculum revision, increasing the supply of textbooks, improving teacher performance, and enhancing special education
- Improving access to ICTs to enhance learning and administration including making ICT a subject and a cross-curricular tool, staff training in ICTs, and developing support services and structures for deployment and maintenance
- Improving efficiency and reducing wastage throughout the education system
- Expanding the provision of senior secondary education (Grades 11 and 12)

- Reforming and expanding vocational education and training, which includes establishing a national training authority, re-equipping government vocational training centres (VTCs), and expanding community skills development centres (COSDECS)
- Strengthening tertiary education and training including the establishment of a National Council for Higher Education and other bodies to ensure high standards and efficient allocation of resources
- Developing a national system of knowledge management and innovation including establishing a national commission for public policy co-ordination and the financing of research
- Enhancing early childhood development and pre-primary education
- Strengthening access to information, culture, and lifelong learning
- Enhancing HIV/AIDS management in education
- Promoting equity in education
- Pursuing a capacity development programme to improve all aspects of institutional development

It was estimated in 2005 that the plan to revamp the Namibian education system would cost Nam$23.4 billion (USD$4 billion) and that the Namibian government will provide Nam$21.8 billion (USD$3.8 billion), leaving a gap of Nam$2 billion (USD$349 million) to the donor community, development partners, and the private sector.

ICT Policy for Education

Consistent with the objectives of Vision 2030 and ETSIP, the Namibian Ministry of Education adopted an ICT policy for education in 2003 which is an update of the original policy developed in 1995 and revised in 2000. Developed by a mixed working group drawn from the two Ministries of Education, the policy reflects recent developments in pedagogy, research, technology, and partnerships and provides a comprehensive and holistic range of issues in its goal to access and use ICTs across the education sector.

The priority areas for the policy are colleges of education and related in-service programmes; schools with secondary grades; teacher education programmes at tertiary institutions; vocational training; primary schools; libraries and community centres; adult education centres; and special needs education. The policy objectives are to:

- Produce ICT literate citizens
- Produce people capable of working and participating in the new information and knowledge-based economy and society
- Leverage ICT to assist and facilitate learning for the benefit of all learners and teachers across the curriculum
- Improve the efficiency of educational administration and management at every level from the classroom, school library, through the school, and on to the sector as a whole
- Broaden access to quality educational services for learners at all levels of the education system and set specific criteria and targets to help classify and categorise the different development levels of using ICT in education

The policy also provides specific strategies for providing of ICT services; staff training; curriculum and performance measures; national technical standards; societal issues; open and distance learning; library, community sport and culture; public private partnerships; education management; and financing.

Policy Implementation

TECH/NA!

TECHN/NA! is a comprehensive implementation strategy that the Namibian Ministry of Education developed based on its ICTs for education policy. TECH/NA!'s main goals are to:

- Equip educational institutions with hardware, software, connectivity, curriculum, content, and technical support
- Educate administrators, staff, teachers, and learners in ICT literacy and ICT integration across the entire curriculum

The ICT policy for education and implementation plan prioritise educational institutions in accordance to their proximity of learners to the labour market. Teacher-training institutions are given the highest priority given their impact on the entire education system. Using these guidelines, the deployment of ICTs in the education sector is based on the following five priorities:

- Pre-service and in-service teacher education institutions
- Schools with secondary grades (combined schools, junior and senior secondary schools)
- Vocational training centres and community skills development centres
- National, regional, and community libraries and community and adult education
- Primary schools

The strategy is also premised on the support of the full range of existing role players, programmes, and projects operating in Namibia. Of these, the major initiatives are outlined below and others are included in Appendix A.

Recently the Namibian Ministry of Finance formally advertised for the submission of tenders for the purchase of the first round of equipment for deployment under TECH/NA! This is considered the biggest purchase of equipment in Namibian government history and will fully equip 40 secondary schools, all teachers' colleges, five teacher resource centres, seven vocational training centres, and 10 libraries. In all, nearly 1,500 computers, over 100 printers, and various other equipment will be purchased.[9]

For more information: www.tech.na

Implementation Co-ordination

An ICT for Education Steering Committee has been established and linked to the Ministry of Education and the ETSIP programme.

ICTs in Education Steering Committee

The ICTs in Education Steering Committee, established by the Ministry of Education in February 2004, creates a single forum for the co-ordination and collaboration of all projects, organisations, activities, and initiatives involved with ICTs in Namibia's education sector. The committee's membership includes representation from the Ministry of Education's executive management team and regional offices, the Teacher Resource Centre network, directorates within the Ministry of Education, tertiary education partners, the colleges of education, ICTs in education projects, civil society organisations, private sector partners, and donor/development organisations.

Ministry Directorates

The Ministry of Education also has the following directorates that are involved in the implementation process and that serve on the ICTs in Education Steering Committee:

- Directorate of Adult Basic Education
- Directorate of Education Programme Implementation
- Directorate of Higher Learning
- Directorate of General Services
- Directorate of Planning and Development
- Directorate of Science and Technology
- Directorate of Vocational Education and Training
- Directorate of Adult Basic Education
- Directorate of Education Programme Implementation
- Directorate of Higher Learning
- Directorate of General Services
- Directorate of Planning and Development
- Directorate of Science and Technology
- Directorate of Vocational Education and Training

ICT Alliance Namibia

The ICT Alliance serves as an umbrella organisation for companies, professionals, and citizens involved and/or interested in ICTs in Namibia. It aims to influence and shape ICT policy-making for the industry and users, drive ICT policy-making in the country, and liaise with and lobby government, non-governmental organisations, private sector, the ICT sector regulator, and the public at large on shaping policy decisions. It also represents the interest of members of the alliance on policy platforms and drafts and proposes sound policy suggestions to present to stakeholders for adoption on existing as well as future policies.[10]

For more information: www.ictalliance.org.na

Current ICT Initiatives and Projects: Schools

NETSS Centre

The National Educational Technology Services and Support (NETSS) Centre was established after a consultative process with all partners involved in ICTs in education in Namibia. The centre is responsible for co-ordinating access to ICTs to all Namibian education institutions by overseeing the sourcing, refurbishment, installation, and support of ICTs. It serves as a distribution hub for ICTs in education and a national helpdesk for technical support. The design of the NETSS Centre is based on models established by SchoolNet Namibia and Microsoft Pathfinder, including input from an analysis of experiences of end users.[11]

The Microsoft Pathfinder Project was initiated in 2003 as a joint venture between the Namibian government, Microsoft, and the Namibian education community. The project involved the development of a schools strategy plan by the Namibian education community in partnership with Microsoft. It included the rollout to 13 pilot schools of refurbished PCs obtained from its Digital Pipeline project, connected to a local area network and a new server on which is installed Microsoft's learning materials. The administration of this project was handed over to the Namibian government in 2005.

GeSCI

The Gobal eSchools and Communities Initiative (GeSCI) was founded by the UN ICT Task Force that was set up by former UN Secretary General Kofi Annan. GeSCI works at local, national, and international levels to support developing countries. Namibia is one of four countries where GeSCI has supported the ICT for education policy development, co-ordination, and implementation process. At the time of writing, GeSCI served as strategic advisor to the Ministry of Education.

For more information: www.gesci.org

SchoolNet Namibia

SchoolNet Namibia is in its seventh year of existence as a not-for-profit civil society organisation, providing sustainable, affordable open source technology solutions and Internet access, as well as technical support, training services, and creative commons-licensed educational content to schools, community-based educational organisations, and educational practitioners throughout the country. SchoolNet Namibia has successfully reached over 350 schools since 2000, which makes it a lead organisation in national ICT policy-making.

SchoolNet Namibia has also been instrumental in the establishment of the XNet Development Trust in partnership with Telecom Namibia in 2003, which serves as a vehicle to provide affordable bandwidth connectivity to a variety of social sectors (such as agriculture, education, health, and SME.). The XNet Trust has the founding president of Namibia as its patron and life member. Telecom Namibia has committed USD$2.05

million to XNet. This strategy has resulted in a standard flat-rate 24/7 Internet access of USD$25/month for schools, and free dial-on-demand Internet access for educators, using SchoolNet's national 0700 number with reduced telecom charges. This compares with the cost of a one-hour Internet call anywhere in Namibia for about USD$2.72. Under the XNet agreement, Telecom Namibia (and other telecommunications providers) support SchoolNet's connectivity service to all schools participating in the SchoolNet scheme nationwide. Provision is also made to subsidise those schools that cannot afford even the discounted rate by a cross-subsidy scheme that encourages privileged schools and other educational centres to pay more if they can afford to do so.

SchoolNet Namibia has recently introduced a comic book and weekly one-page newspaper and Web-based inserts called Hai Ti! ("listen up"). Hai Ti! Is published under a creative commons licence and aims to popularise the use of ICTs among Namibian teachers, the majority of whom are women and who have historically been technophobic.

SchoolNet Namibia has a wide range of partner organisations. It has historically been supported by IDRC and then later USAID and Sida who invested significant core funding.

For more information: www.schoolnet.na

Current ICT Initiatives and Projects: Higher Education

Colleges of Education

The four colleges of education (Caprivi, Ongwediva, Rundu, and Windhoek) in Namibia deliver pre-service teacher education to prepare student teachers to teach in Grades 1 to 10. Student teachers follow a three-year programme of study focusing on educational theory and practice as well as subject specialisation.

For more information: www.nied.edu.na

Institute of Information Technology (IIT)

Established in 1997, IIT is a privately owned training and education provider that has a national footprint with three full campuses and five satellite centres countrywide. It delivers internationally accredited industry qualifications to around 4,500 Namibians annually in disciplines ranging from basic computer literacy to hardware and software engineering as well as a bouquet of business and management courses accredited by the University of Cambridge. IIT utilises a blend of training methodologies including instructor-lead training, online training, computer-based training, supported correspondence training, and home education. Through its other divisions IIT provides Namibians with stable refurbished computers running on a mixture of open source and Microsoft platforms.

Polytechnic of Namibia

The Polytechnic of Namibia contributes to Namibian development by providing tertiary technological career-oriented education at internationally recognised standards. The main

objective is the practice, promotion, and transfer of technology to meet the professional human resource requirements of the country and those of the region and beyond.

For more information: www.polytecnic.edu.na

University of Namibia
The University of Namibia, established in 1992, delivers education designed to meet national human resources requirements through quality teaching, research, consultancy, and community services. Through its highly competent and dedicated staff and quality infrastructure, the university has been serving the nation in various ways and has contributed significantly to national reconstruction and development since its inception. The University of Namibia offers three types of ICT programmes:

- *Computer science* with heavy emphasis on programming, database management, networking, offered as one of two majors in the B.Sc. double degree.
- *Information studies,* which combines library science and information technology
- *Journalism,* which concentrates on graphic design and desktop publishing

For more information: www.unam.na

Current ICT Initiatives and Projects: TVET, ABET, and Informal

CECS Namibia
CECS Namibia is not-for-profit training organisation that provides training and support for teachers and communities in ICT literacy. CECS currently focuses on basic computer literacy, and as communities and teachers become literate in the basic skills, advanced literacy and pedagogy courses are available.

For more information: www.nied.edu.na/edusupport/cecs.htm

E-Learning Centre (ELC)
In April 2006 the Namibian ELC was formally launched through a partnership between the Namibian Open Learning Network Trust (NOLNet) and InWEnt (Capacity-building International, Germany). Established under the auspices of NOLNet, the ELC functions as the service hub for e-learning activities in Namibia and beyond.

NAMCOL
The Namibian College of Open Learning (NAMCOL), a parastatal educational institution created in 1997, provides continuing education learning opportunities for adults and out-of-school youth. NAMCOL has since grown to become the largest educational institution in Namibia by total number of students.

For more information: www.namcol.com.na

NOLNET
The Namibian Open Learning Network Trust (NOLNet) is a co-operative initiative of the

Ministry of Education, the University of Namibia, the Namibian College of Open Learning (NAMCOL), the Polytechnic of Namibia, and the National Institute for Educational Development to "establish a network of open learning centres throughout the country at which certain facilities will be shared and services offered on a collaborative basis." NOLNet enhances opportunities for supported, independent learning for adults and young people who cannot take part in conventional, institution-based education. The Open Learning Network enhances services provided by community libraries, teacher resource centres, school libraries, NAMCOL tutorial centres, and community learning and development centres.

Implementing ICT in Education: What Helps and What Hinders?

Namibia is unquestionably a front-runner in ICTs for education in Africa. The Government of Namibia has been visionary in its development of policy and organisations such as SchoolNet Namibia are well known for their leadership and pioneering role in the provision of low-cost ICT solutions for an African school context, especially within pan-African networks such as SchoolNet Africa.

Table 4 provides a summary of the current stage of ICT development in Namibia in terms of enabling or constraining features in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation	Namibia has had a dedicated national ICT policy for education since the late 1990s. This policy framework is consistent with the broader government vision and strategy to enable the development of a Namibian knowledge-based economy.	
Advocacy leadership	Within government and among civil society organisations such as SchoolNet Namibia, there is incredible leadership and innovation in the promotion of ICT access and use for learning and teaching in Namibia's education institutions.	
Gender equity	SchoolNet Namibia has led the way in promoting home access to computers for Namibia's teachers, 75% of whom are women. It also established a dedicated comic magazine with positive female	

	heroes and role models in their promotion of women's empowerment and gender equality in the use of ICTs.	
Infrastructure and access	Namibia has a well-developed ICT infrastructure because of its historical and economic ties with South Africa. Namibia has also pioneered low-cost sustainable access solutions including an open lab model for schools and flat-rate Internet access for education institutions.	
Collaborating mechanisms	Various collaborating mechanisms exist in Namibia that foster collaboration between government, civil society, and private sector agencies.	
Human resource capacity		Because of the low levels of education in Namibia the country is constrained by very limited human resource capacity.
Fiscal resources	The Ministry of Finance has just released a tender for support with rolling out ICT access to all education institutions backed by fiscal support.	
Learning content	Use is made of a range of creative commons-licensed materials.	Not much digital content is available that is aligned specifically to the Namibian national curriculum.
Attitudes	The leadership of Namibia's civil society, private sector, donor community, and government have a very positive attitude to the promotion of ICTs in education.	

Appendix A: Additional Initiatives

Some of the initiatives listed below are explicit ICT for education projects while others are not but have dedicated projects within them that focus on ICTs.

Activity	Programme Name	Project Description	Partners and/or Managing Agency	Web site
Management consultancy	Accenture Development Program	NGO set up to provide consultancy support to NGOs.	Accenture	www.accenture.com
Education publishing	Cambridge University Press	Publishes academic and educational writing	Cambridge University	www.cambridge.org/uk
ICT literacy training	Community Education Computer Society (CECS)	Training and support provision for teachers in ICT literacy	CECS Namibia	www.nied.edu.na/sedusupport/cecs.htm
e-Learning Content	LearnThings	Development of interactive e-learning curriculum materials	LearnThings Africa	www.learnthings.co.za
Education Volunteers	PeaceCorp Namibia	Provision of volunteers from the US to support the Namibian education system in teacher development, ICT labs, HIV/AIDS clubs, etc.	PeaceCorp	www.peacecorp.gov.
Training	Rossing Foundation	Supports and provides opportunities for adults and young school leavers to engage in lifelong learning through the provision of training and associated activities.		www.rossing.com/namibia
Teacher Volunteers	WorldTeach	Volunteers as English, mathematics, science, and computer studies subject teachers in schools and adult training facilities. Also serve as HIV/AIDS resource teachers.		www.worldteach.org
ICT Solutions	Information Technology Department	Designs and deploys ICT solutions tailored to the needs of schools and communities throughout Namibia.	Parliament of Namibia; Information Technology Department	
Literacy and Vocational	IFESH	Empowers individuals of developing nations	IFESH Namibia	www.ifesh.org

Activity	Programme Name	Project Description	Partners and/or Managing Agency	Web site
Training		through the operation and support of community-based programmes in the areas of literacy, education, vocational training, agriculture, nutrition, and health care.		
Basic ICT Literacy and Skills	ICDL Foundation	The world's leading end-user computer skills certification programme and an internationally recognised qualification designed specifically for those who wish to gain a benchmark qualification in computing to develop ICT skills and enhance career prospects.	ICDL Foundation	www.icdl.org.za

Notes

1 The World Factbook 2007. https://www.cia.gov/cia/publications/factbook/geos/wa.html
2 EFA Global Monitoring Report. 2007. UNESCO. http://portal.unesco.org/education/en/ev.php-URL_ID=49591&URL_DO=DO_TOPIC&URL_SECTION=201.html
3 UNICEF Namibia: Statistics. http://www.unicef.org/infobycountry/namibia_statistics.html
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5 Namibia: Government to overhaul education sector . http://www.irinnews.org/report.aspx?reportid=53403
6 Global Information Technology Report . http://www2.weforum.org/site/homepublic.nsf/Content/Global+Competitiveness+Programme/Global+Information+Technology+Report.html
7 Assessing consumer activity in the telecoms and Internet sectors in Africa. http://www.afridigital.net/downloads/IDRCconsumerdftV2.doc
8 The World Factbook 2007. https://www.cia.gov/cia/publications/factbook/geos/wa.html
9 Global eSchools and Communities Initiative. http://www.gesci.org/gesci/publisher/index.jsp
10 TECH/NA!, Namibia's ICTs in Education Initiative. http://www.tech.na
11 Ibid.

Given the constantly changing nature of the Internet, we suggest that you copy the document or web site title (and author or organization name, as appropriate) of a resource below into your favorite search engine if a link on this page is not working.

ICT in Education in Niger

by Osei Tutu Agyeman
June 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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Overview

The Republic of Niger is mostly desert and it is the poorest country in the world. Subsistence agriculture is the principal economic activity of its people who are confronted with inclement seasonal weather changes that further impact negatively on harvest volumes.

The country has an underdeveloped electric power and communications infrastructure that can hamper its drive towards the deployment of ICT in the education sector and the public at large. Another challenge is the scarce financial resources that render the provision of basic educational infrastructure nearly intractable to government not to mention the supply of computers to schools.

It is worthy to note, however, that the Niger government has implemented structures and made plans that should enable accelerated development in the ICT sector if the necessary donor support is found.

Country Profile

The Republic of Niger is a landlocked country in the Sahel region of West Africa. Niger is bordered by Algeria, Mali, Libya, Burkina Faso, Benin, and Nigeria.[2] The country is plagued by frequent droughts which have an adverse impact on the subsistence-based economy of its large agrarian population. The major languages are French, Hausa, and Djerma.

Table 1 provides some selected soci-economic indicators for the country.

Table 1: Socio-economic Indicators: Niger

Indicator	
Population[3]	12.5 million (2006 est.)
Growth rate	2.92% (2006 est.)
GDP (US dollars)	$2 billion
GDP per capita[4] (US dollars)	$170
Human Development Index[5]	177 (out of 177 countries)

Uranium[6] contributes 31% to the country's total export earnings. Thirty-three percent of the country's ground area is cultivated by 90% of the population that live off agriculture which contributes about 40% to the GDP. Sixty-six percent of the population lives below the poverty line[7] with 34% in abject poverty. Niger's population has 65% health coverage.

The Education System

Niger' education system consists of six-years of primary, four years of junior secondary, and three years of senior secondary, and two to four years of tertiary education.[8] The first six years are compulsory, and the mandatory school enrolment age is seven.

The Ministry for Basic Education and Literacy is responsible for primary education, and the Ministry for Secondary, Higher Education, Research and Technology is responsible for secondary and tertiary education.
Each of the two ministries has a regional departmental headquarters located in each of the eight regions of the country that manage issues related to the sector under their jurisdiction. The Ministry for Basic Education has 40 literacy centres and three directorates across the country for its literacy programmes.

The government builds 1,000 classrooms in the rural areas each year under the HIPC initiative. A new teacher recruitment policy was implemented to augment the number of teachers especially in the basic education sector. Further, 35 schools have been rehabilitated for 1,198 pupils.

Education currently receives 28% of the government's budget allocation, 40% of which is from HIPC funds with 50% of the provision for basic education.

Enrolment disparities exist between the urban and rural populations as well as between the sexes. The ratio of girls to boys' enrolment[9] is 65:100 and the rural to urban ratio is 45:100.

The literacy rate[10] for youth is 25.6% and 20% for adults (with males at 30% and females at 11%).

Infrastructure

Telecoms

Niger invested more than FCFA 25 billion (approx. USD$50 million) in telecom infrastructure[11] to establish digital international telephone and automatic telex connectivity with the rest of the world. The main operator, Sonitel, is 51% privatised and has 25,000 subscribers (2005) distributed over 13 switching centres in 13 localities without any fibre optic installation.

Other services enabled are Nigerpac, a data packets transmission service; leased line services; the Internet; cellular telephone services; and VOIP services by 11 operators in six of the big cities including Niamey. Many cyber cafés offer VOIP, Internet access, and basic computer training services. Meanwhile a substantial portion of the country's network is analogue and most times it is unreliable except in the capital, Niamey, and some selected cities like Maradi, Koni, and Gaya. There are three mobile operators and 300,000 cellular subscribers with coverage for all the big cities.

There is growing demand[12] in the capital and some rural areas for quality telecoms service. However, capital investment funds from government budget sources are inadequate.

An NGO, Telecom Sans Frontières (TSF),[13] has established a cyber café in Dakoro, one of the cities in Niger that caters for government agencies and private sector companies. TSF intends to train the student population on the use of computers and the Internet. Other interested companies may connect to the VSAT service using Wi-Fi (wireless connectivity) to prevent unnecessary physical movement to the TSF site.

Beyond these possibilities, Internet communication in other cities in Niger is at best via dial-up connections over noisy telephone lines.

Electrification

Niger produces 232 KWh of electricity from its thermal plant[14] and sources the rest of its energy needs from Nigeria,[15] but it is able to provide for only 10%[16] of the population in the cities.

The rural areas where 85% of the population resides have no electricity. Consequently in July 2006, the government created the Cellule d'Electrification Rurale (CER)[17] (Rural Electrification Unit) to address the problem.

One group, SOS Kandadji,[18] has also initiated moves to find funding from international sources for the construction of a dam over the Niger River to produce 125 megawatts of electricity. The project has yet to obtain funding.

Policy framework and implementation[19]

Niger's NICI plan recognises the role of a national steering committee involving government, private sector, the press (television and radio), and civil society. Development partners are invited as observers to committee sessions. It also establishes the ICT co-ordination centre responsible for ICT application in government.

The policy reveals six main strategic components:

- Infrastructure development
- Linking ICT to the Poverty Reduction Strategy (PSR)
- Legal and regulatory issues on ICT
- Content development
- Capacity-building
- E-government

With assistance from the ECA, Niger finalised and presented its ICT development plan to the national assembly in May 2005.

Further, the High Commission for New Technologies in Information and Communication (HCINTIC) was established to midwife the process, specifically to develop the legal,

regulatory, and institutional framework, including the harmonisation of policies with sister countries and regional organisations. The Commission, which is located in the office of the prime minister, is equally responsible for ICT policy promotion and technology development at the national level.

Niger has established an ICT training centre in Niamey, a branch of l'Institut Africain d'Informatique based in Gabon, and created a sectoral network comprising the press, female parliamentarians, NGOs, youth, and the universities to help accelerate the integration of the various strata of society with ICT development.

Some government departments have already been linked using fibre optic cable, and a study on the harmonisation of sub-networks of the government intranet is being conducted and the feasibility study on the interconnection of ministries and institutions of state is complete.

Siemens Networks has linked[20] Niger via Burkina Faso and Benin, Niger's western and southern neighbors, to the SAT-3 submarine cable using fibre optic cables. A section of the fibre optic backbone laid for international communications and interconnectivity of the national territory was inaugurated in Niamey in November 2006. Siemens Networks has already provided voice and data on 100 client loops. This development has necessitated the call to ISPs to increase bandwidth.

ICT Policies

Niger's 10-year educational development plan (PDDE; 2003-2012) stipulates:

- Supporting access and retention of girls in school through strategies and implementing plans at the local level
- Offering tutorial assistance to girls
- Improving schools for the handicapped, schools in nomadic zones, and schools for dispersed populations
- Providing food for pupils
- Offering teacher training including the management of multi-grade classes as rural alternative schools
- Developing integrated schools and institutions for the deaf
- Implementing a strategy to cater for dispersed children and adapting the school calendar to disadvantaged pupils

Assistance to disadvantaged populations and girls has become imperative given the current situation where two out of three children are unschooled with a worse statistic for the rural area; only 32% of the students pass their basic school exams; only 16% of the students are successful in secondary schools without repeating; and private school fees are in the order of USD$1,000 compared with USD$15 for the public schools.

This worsened situation is the result of policies introduced upon the implementation of the structural adjustment programme which culminated in the privatisation of services in

the university (restaurant facilities, residential accommodation, and transport); replacement of qualified teachers with poorly paid contractual staff due the cessation of recruitment in the civil service; increase in school fees; and other adverse measures.

The government's ICT plans involve focusing on and reducing the dearth of knowledge and acute illiteracy in the population through employment of ICT. The planned ICT emphasis, it is hoped, will help create jobs. However, owing to the extreme prevailing poverty, the 10-year programme does not include any indication of ICT application in education. Furthermore, government's inability to provide an adequate number of schools and educational infrastructure makes the populace assume that it has abdicated its responsibility[21] to its citizens.

Current ICT Initiatives and Projects

ICT law

Niger already has had a draft[22] ICT law since January 2006 that is yet to be promulgated. The law requires the training of officers in its legal institutions, the restructuring of existing institutions, and the establishment of new ones before it can be effectively applied.

Primary education

The "basic school for food" programme and other educational policies have generated an increase in enrolment from 37.3% in the past to 50% in 2005.

Development partners, specifically the European Union,[23] emphasise assistance on teacher training, the integration of schools into their environments, and development of bilingual training (i.e., the local language and French). In 2005, 80 public schools introduced the teaching of the local languages and French while the teacher-training colleges instituted new teacher training methods.

Since 2005 the UNDP[24] has been donating 400 refurbished computers to 40 primary schools each year. The laboratories enable the pupils to use computers and surf the Internet. The objective is to impact 200,000 pupils each year in 40 schools. The UNDP will also train the teachers who will train their pupils. The project aims at inciting intellectual curiosity, research, and the use of computer tools early in primary school children.

Vocational and technical training

The European Community is assisting Niger to provide post-primary education training to school leavers. The budgetary support has enabled the country to build community development training centres which provide training for the unschooled and school dropouts. The government has built 25 of these facilities of which 10 are for females.

Tertiary education

- The University of Lausanne[25] and the Department for Cooperation and Development of the Republic of Germany assisted the Geography Department of the Abdou

Moumouni University in Niamey with 15 computers, which enabled the faculty to run remunerative consultancy services to augment its budget even in dire financial circumstances confronting the university. Receipts from those services enabled the faculty to establish a second geography computer laboratory with Internet connection.

- The World Health Organization donated computer equipment to the Faculty of Health Sciences in the Abdou Moumouni University in Niamey to assist it to combat malnutrition[26] and conduct nutritional surveillance in 2005-2006.
- The Agence Universitaire de la Francophonie[27] has also established a Campus Numérique (learning centre) in the university. The centre is equipped with 50 computers and two servers. There are plans to increase the number of computers to 70. The learning centre enables students to apply to universities in the francophone world. Their applications are vetted and those successful are given scholarships that permit them to pursue degree or master's level programmes at about 15% of the original cost.
- The African Virtual University (AVU),[28] a World Bank-sponsored e-learning project, has adopted the Université Abdou Moumouni of Niamey as one of five francophone universities in its distance learning programme. The AVU learning centres are equipped with VSAT Internet connection, servers, 25 PCs, and ancillary equipment, televisions, and video-conferencing facilities. AVU courses are via the Internet, on video cassette or by video-conference where interactive sessions with instructors in remote places are organised for students and lecturers. The AVU structure permits the intervention of local tutors to assist students in difficulty, practical work, and examination assessment at the local level by local tutors in the host university. The average cost of programmes is USD$900. The very first few students on the AVU programmes are Niger government scholarship holders – an indication of government support for technology driven education.

Television in education

Télévision scolaire (education television) was introduced by the French government in Niger in the 1960s. The government then installed television sets in community centres as a way to reach the larger population with the programmes. However, this was discontinued owing to criticisms that while the lessons enabled its audience to learn to read rapidly, it did not equip them with adequate writing skills.

Radio in education

The government has envisaged a nationwide interconnected community radio project to be linked to the Internet. The radio network will be used to sensitise the population and produce mainly development-oriented programmes. The Internet connection is to permit the stations to transmit the same programmes when necessary. The system is called RURANET[29] and is to be launched in collaboration with UNICEF, FAO, and other international organisations.

Implementing ICT in Education: What Helps and What Hinders?

Table 2 lists the core factors and provides a summary of the current state of development in Niger in terms of enabling or constraining ICT applications in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features	Risk Factors
ICT deployment	• Installation of the 2 MB bandwidth connection in Sonitel has made Internet available in Niger. • AVU and the AUF facilities have improved Internet access especially for the university community.	AUF and AVU courses are within the reach of very privileged few who can afford the fees or who obtain a government scholarship.	Inability of government to extend ICT infrastructure due to financial and budgetary constraints
Non-formal education	Political and budgetary support for NFE Community schools: 500 teachers trained.	Insufficient funds once the HIPC initiative ends and necessary government budgetary support may not be available	Financial means to continue and maintain the facilities after completion of the HIPC programme and donor funds
Gender equity	• Awards given to committed female adult learners in the NFE centres to encourage the participation of girls and women • Centres built close to the communities to encourage participation • Some centres created purposely for girls and women	• Tradition that keeps girls from being educated especially in the rural areas • Girls put to domestic chores • Discrimination against girls • Sexual harassment	• Stoppage of the sensitisation programme for girls' education • Exhaustion of the HIPC funds
Vocational and professional education	Government policy to build a lot more technical/vocational schools using HIPC	Government budgetary constraints	Inadequacy of the number of centres
ICT policy implementation	Policy developed and publicised.	Slow pace of implementation due to financial constraints	Government's inability to source vital funds from donors and partners to develop and extend telecom infrastructure and

			electricity to the larger population in order to widen access to ICT

Notes

1 The World Factbook 2007. https://www.cia.gov/library/publications/the-world-factbook/geos/ng.html
2 US-Africa. http://us-africa.tripod.com/niger.html
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by Osei Tutu Agyeman
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Overview

The Federal Republic of Nigeria has no specific policy for ICT in education. The Ministry of Education created its ICT department in February 2007, notwithstanding several government agencies and other stakeholders in the private sector having initiated ICT-driven projects and programmes to impact all levels of the educational sector.

The challenge is the lack of electric power and telecommunications infrastructure in a substantial part of the country. Mobile telecommunication currently covers 60% of the national territory, but mobile telephone companies generally power their base stations using electric power generators since the Power Holding Company of Nigeria (PHCN) is unable to supply them with power. This phenomenon is prevalent nationwide and constitutes the bottleneck to effective countrywide deployment of ICT in education.

It is projected that Nigeria will be a net supplier of electric power by the end of 2007 when its massive cross-country electric power grid construction and interconnection projects are completed. It is hoped that mobile operators will introduce technologies that permit Internet access on their networks across the country to facilitate the implementation of e-learning programmes.

Country Profile

The Federal Republic of Nigeria is the most populous black African country in the world. It is located in West Africa, south of the Sahara. It borders the Gulf of Guinea in the south, Cameroon in the east, Niger and Chad in the north, and Benin in the west. It is a federation of 36 states divided into six geopolitical zones.

Table 1 provides some selected soci-economic indicators for the country.[2]

Table 1: Socio-economic Indicators: Nigeria

Indicator	
Population	140 million (2007)[3]
GDP per capita (US dollars)	393
Phone subscribers per 100 inhabitants (fixed and mobile)	14.5 (2006)
Computers	860,000
Internet hosts	1,094
Internet users	750,000
Radio households	15.3 million
TV households	6.3 million

The Education System

The National Council on Education co-ordinates planning, policy, and finance for the education sector under the federal government. The Council consists of the Commissioners and Ministers

of Education and the Joint Consultative Committee on Education. Education administration responsibility is shared with the federal government across the federation by the different administrative structures as follows:

- Primary level: local governments
- Secondary level: state governments
- Tertiary/university level: federal government

The federal Ministry of Education employs several national organs for its standards maintenance role in the specialised aspects of education. These include:

- The Federal Inspectorate Service
- The Nigerian Educational Research and Development Council
- The Science Equipment Centre
- The School Broadcasting Unit

Primary and secondary educations are both six years, and tertiary education may take one to four years depending on the qualification sought. The nine-year compulsory education is a combination of the primary education of six years and three years of junior secondary school education. Table 2 presents some enrolment statistics.[4]

Table 2: Gross Enrolment Ratios (%)*

Level\Year	1995	2000	2004
Primary	93.3	95.5	99.2
Secondary	32.0	24.2	34.6
Tertiary	4.3	6.6	10.2

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.

As at 2004, the ratio of pupils to teachers at the elementary level was 50.3 to 1. The literacy rate was 68% overall, with the female rate at 59%.

Infrastructure

Telecommunication

Presently the two national carriers, Nigeria Telecommunications Company (Nitel) and Globalcom, are both private entities. Nitel was public ally owned until late 2006 when it was privatised. There are four digital mobile (GSM) operators, and 20 other operators have been licensed to provide fixed wireless services at national and regional levels. All six geopolitical zones have Internet access, and efforts are being pursued to increase penetration. In 2000 the penetration rate was 1 in 100 persons; by 2006 the ratio had improved to 14.5 in 100.[5]

Nigeria is a member of the consortium that runs the SAT-3 submarine fibre optic cable. The country launched its first communication's satellite NlGCOMSAT-1 on 13 May 2007 to provide telecommunications coverage, navigation, television distribution, direct broadcasting system (DBS), digital broadband, etc.

Nigeria intends to use NIGCOMSAT-1 to create 150,000 jobs, save the country hundreds of millions of dollars a year, provide Internet access to remote rural areas, and to specifically help tele-education (educational television and e-learning) for the distance learning initiative. An agreement has also been signed with Patriot Inc (USA) to invest in VSAT manufacturing within Nigeria as a means to reduce the cost of antenna/VSAT on the local market.

Investment in the telecommunications sector exceeded USD$8 billion in 2006[6] from the low of USD$500 million in 2000. MTN, the leading GSM operator, has nearly completed building a 3,500 kilometre, ultra modern nationwide fibre optic transmission network which will help accelerate ICT projects and values in the economy. MTN's extensive transmission infrastructure provides access to approximately 60% of Nigerians. Other private operators are engaged in similar initiatives and projects in the country.

Electrification

The nation generates 3,500 megawatts of electricity against a required minimum of 5,500 megawatts. About 40% of Nigerians enjoy electricity from the national grid. However electric power supply is sporadic, and several communities in urban areas lack electric power. To date, 57 of the 774 local government headquarters are yet to be connected to the grid. The government increased the number and accelerated the development of power generation facilities nationwide after the return to democracy.

Rural communities are worse off because of the absence of infrastructure. In pursuit of the vision to improve access to electric power, most especially by rural dwellers, the government signed into law the Nigerian Electric Power Sector Reform Act (EPSRA) which established the Nigerian Electricity Regulatory Commission (NERC) and the Rural Electrification Agency (REA). The REA[7] is responsible for implementing the rural electrification fund, regulating rural electrification functions not covered by the NERC, and promoting rural electrification.

ICT Policies

Nigeria started implementing its ICT policy in April 2001 after the Federal Executive Council approved it by establishing the National Information Technology Development Agency (NITDA),[8] the implementing body. The policy empowers NITDA to enter into strategic alliances and joint ventures and to collaborate with the private sector to realise the specifics of the country's vision of, "making Nigeria an IT capable country in Africa and a key player in the information society by the year 2005 through using IT as an engine for sustainable development and global competitiveness." This vision is yet to be fulfilled.

Outlined below are some of the objectives of Nigeria's ICT policy:

- To ensure that ICT resources are readily available to promote efficient national development
- To guarantee that the country benefits maximally, and contributes meaningfully, by providing the global solutions to the challenges of the Information Age
- To empower Nigerians to participate in software and ICT development
- To encourage local production and manufacture of ICT components in a competitive manner
- To establish and develop ICT infrastructure and maximise its use nationwide
- To empower the youth with ICT skills and prepare them for global competitiveness
- To integrate ICT into the mainstream of education and training

- To create ICT awareness and ensure universal access in promoting ICT diffusion in all sectors of national life
- To create an enabling environment and facilitate private sector (national and multinational) investment in the ICT sector
- To encourage government and private sector joint venture collaboration
- To develop human capital with emphasis on creating and supporting a knowledge-based society
- To build a mass pool of ICT literate manpower using the NYSC, NDE, and other platforms as a train-the-trainer scheme for capacity-building

Telecommunications
Nigeria's telecommunications policy[9] was briefly stated by its Minister for Communication, Mr. Frank Nweke Jr., during his address at the 4th World Telecommunications Development Conference in Doha on 8 March 2006.

Policy implementation which was initiated as part of the current government's public sector reform agenda was launched in 2000 and focuses on:

- Deregulating, liberalising, and privatising the telecommunications industry
- Providing incentives to telecom investors and operators to facilitate their entry into the Nigerian telecom market by waiving tax and import duties
- Promoting and providing access to telecommunications facilities and services at reduced cost while increasing penetration

Consequently the Nigeria Telecommunications Act was passed by the National Assembly to give autonomy to the Nigeria Communications Commission (NCC) as the telecommunications regulator responsible for the implementation of the policy.

The government has also introduced converged licensing for ISPs for the benefit of the disadvantaged communities and rural populations. Bulk bandwidth purchasing by the Nigeria ISPs association (NISPA) is currently at 100 naira per hour for broadband Internet access, which is less than USD$1 at the going exchange rate.

Educational policy
Nigeria's objective for primary education does not elicit the knowledge of ICT. Emphasis is placed on:

- Widening access to basic education
- Eliminating present inequalities in the enrolment between the urban and rural populations
- Ensuring greater retention in schools
- Ensuring long-term permanent literacy for those children who have completed the programme

While ICT knowledge is not evoked in the vision set for primary school pupils, it is abundantly clear that government's new policies and programmes in the telecommunications and ICT policy sectors do address the problem otherwise.

Current ICT Initiatives and Projects

Nigeria's education ministry is yet to design its ICT policy for education. The Ministry's ICT department was created in February 2007. However several different initiatives by government agencies and the private sector to introduce and promote ICTs in education are underway. The drawback to these programmes is the generally sporadic and insufficient supply of electric power in the urban areas.

ICT in primary education

The energy problem motivated the government to embrace the US$100 XO laptop computer project for Nigeria's 24 million public primary school children. The government has ordered one million of these laptops, which can be cranked and do not need external power supply, for the primary school children. The laptop has in-built wireless networking, uses a 512 MB flash memory without a hard disk, and has two USB ports to which more memory or devices could be attached. It has a new user interface known as Sugar, and comes with a Web browser and a Web processor.

Given the telecoms and energy landscape described above, it may require a countrywide extension and provision of wireless Internet facilities by the private mobile operators, like MTN, accompanied by the provision of alternate sources of electricity to enable optimum usage of the laptops by Nigerian elementary schools. The laptops are yet to appear in the country as experts continue to debate the appropriateness of that ICT approach for Nigerian primary schools; opinions oscillate between establishing computer laboratories for all schools and instituting probably unsustainable child-per-laptop ownership schemes.

Some private elementary schools, however, have computer laboratories, especially those located in the high-class zones of the big cities.

ICT in secondary-level education

SchoolNet Nigeria is a non-profit organisation created to address the use of ICT in Nigerian secondary schools with the support of several government ministries.[10] It is a public sector initiative geared at mobilising Nigeria's human and financial resources for the purpose of using ICTs in education. SchoolNet creates learning communities of educators and learners to use ICTs to enhance education by:

- Implementing, supporting, and co-ordinating ICT development projects in education
- Providing and supporting lower-cost, scalable technology solutions and Internet for schools
- Providing support mechanisms for schools for technical infrastructure and connectivity

SchoolNet Nigeria has, in collaboration with the mobile phone operator MTN, established ICT laboratories/cyber cafés for four schools in four states in each of a four-phase project using local ISPs. SchoolNet has yet to embark on phase four of the project.

Similarly, SchoolNet Nigeria, in collaboration with the computer company BusyNet, is setting up ICT laboratories/cyber cafés in four schools in 12 states.

Another initiative by Zinox[11] Computers, a private computer company, in collaboration with Microsoft, is set to revolutionise ICT usage in education from the primary to the university level. Zinox's strategy is targeted at students, lecturers, and the institutions themselves. The company provides the computers at highly discounted prices and hopes with government support to

achieve 75% ICT application in Nigerian schools by 2010. First Bank of Nigeria is bankrolling the project. ICT labs are set up for schools that repay in two to three years. Lecturers repay the cost of their laptops in one year.

The ICT revolution has also registered corporate backing not only with computer companies like Zinox but also with the banks. Over 80 schools have benefited from the Zenith Bank's ICT for Youth Empowerment scheme. The scheme focuses on assisting Nigerian youth to bridge the digital divide through early introduction to ICT. Each school receives a minimum of 10 computers.

To encourage the use of ICT, the bank organises an annual ICT empowerment forum for youth that attracts about 2000 secondary- and tertiary-level students. The bank distributed 100 personal digital assistants (PDAs) to the first 100 students to arrive at the venue in 2006.

ICT in tertiary-level education

The National Universities Commission (NUC), the government agency responsible for registering and regulating universities, has prescribed[12] PC ownership for universities as follows: one to every four students, one PC to every two lecturers below the grade of Lecturer 1, one PC per Senior Lecturer, and one notebook per Professor/Reader.

While some universities, like the Nnamdi Azikwe University, have achieved a better ratio for their faculty, the same cannot be said for the PC-to-student ratio. However, some universities have made giant strides in campus-wide area networking and e-learning course deliveries.

The Obafémi Awolowo University (OAU) boasts of having the best-developed ICT system in the country with its own VSAT access to the Internet and a campus-wide intranet. OAU has embarked on the progressive application of ICT to all its functions and services – academic, research, and administrative. The OAU has more than 6,000 users on more than 1,000 computers distributed in 15 computer laboratories across the campus.

Meanwhile, among the universities, the University of Jos (UNIJOS) is blazing the trail for content development and e-learning in addition to campus networking. UNIJOS, in collaboration with AVOIR (African Virtual Open Initiatives and Resources) and the Carnegie Corporation (USA), has developed e-learning programmes for several departments. One notable achievement is the medicine by e-learning Web site of the Department of Anatomy of UNIJOS that permits students to undertake virtual electronic dissections – a phenomenon believed to be the first of its kind in medical training worldwide. Under a collaborative programme, lecturers from the Universities of Oxford and Cambridge have facilitated courses as part of the ICT initiative sponsored by A.G. Leventis.

The authorities in other universities have organised study tours to the OAU and UNIJOS sites as part of preparatory activities towards the implementation of their own laboratories and campus networks.

The National Open University of Nigeria (NOUN), established in 2002, has created 27 study centres across the country. NOUN's dream is to establish study centres not only in each of the 36 states of the federation but also at local government area in order to make tertiary education available to all citizens. Each NOUN[13] study centre is a computer laboratory/cyber café equipped

with a minimum of 25 computers in a local area network (LAN) configuration. The centres are yet to be connected to NOUN's REPRODAhq (repository, reproduction, distribution and administration headquarters) through a wide area network (WAN) to enable the mainstreaming of the following activities:

- Training and learning
- Assessment and testing
- Interactive sessions
- Communications (e-mail, chat, forums)
- Internet access
- Access to virtual library
- Other computer applications

NOUN uses the WAN to deliver distance learning courses to all the study centres. Each study centre has facilitators (instructional and tutorial) and student counsellors responsible for guidance and counselling services to the learners. The facilitators and counsellors are drawn from within the community or nearby communities. NOUN's ICT applications presently cover:

- Management of student records (on-line application, admission, registration, and exam procedures)
- Learner management system (e-learning and the virtual library)
- Communication (e-mail, SMS, video-conferencing, and Internet)
- Delivery of the human resource and finance courses. The pdf files of these two courses are already available on-line. The goal of NOUN is to use the REPRODAhq to eventually reproduce all course materials in electronic form.

In 2007 NOUN will, for the first time, receive government budgetary allocation for its programmes. To date, NOUN essentially obtained funding from other sources to mount its programmes and projects. Other government agencies employing ICT bemoan the low levels of government subvention.

The NUC started an on-line mandatory continuous professional development (MCPD) programme in pedagogy called the Virtual Institute for Higher Education Pedagogy for lecturers who do not have qualification in education.

The British Council has initiated a Digital Library Project (DLP)[14] project to assist universities to digitise their libraries.

Acquisition of basic ICT skills and capabilities have recently been made mandatory as part of the national minimum standard for teacher education at the Nigeria Certificate of Education and first degree in education levels. Also, some universities in Nigeria have made ICT skills a requirement for continuing and graduating students. Thus, the teacher education colleges have also been impacted by the current ICT revolution. The Federal College of Education (FCE) in Omoku has 130 computers in three e-learning classrooms each with 30 computers and a cyber café with 40 work stations.

Microsoft and CISCO interventions

In 2003 Microsoft and the Nigerian government signed a three-year agreement intended to enable Nigeria to deploy ICTs in order to accelerate economic growth. This partnership is to help Nigeria build its software development industry as well as streamline the government's use of Microsoft software tools. It is also intended to stimulate the private sector and increase Nigeria's global competitiveness. To this end Microsoft will provide support to the Computers for All Nigerians initiative and will produce their software in three local languages, Hausa, Igbo, and Yoruba, by the end of 2007.

Further, Microsoft has signed an MOU with the Educational Trust Fund (ETF)[15] under the Microsoft Partners in Learning Programmes (PiL) to develop the ICT skills of teachers. Microsoft and ETF are also jointly building a teacher-training methodology that will become the future standard for schools countrywide. The two parties hope to bring technology to bear on primary, secondary, and tertiary education through these agreements. Accordingly, NITDA is offering free training on Microsoft products to ICT staff in government and public enterprises. The government has also acquired Microsoft products for free distribution to these enterprises.

Another agreement[16] between the two parties focuses on cyber crime detection and prevention. The MOU stipulates that Microsoft will share information and train and build capacity of Nigeria's law enforcement agencies to fight cyber crime. The agencies will also benefit from training sessions for law enforcement officers and representatives, sponsored seminars, information for successful enforcement, and access to Microsoft's technical expertise. Nigeria's Economic and Financial Crimes Commission is the government organ involved.

Partnership with CISCO is also being promoted. The company seeks to provide the necessary services to telecom operators to grow their voice and data services and has established 22 CISCO training academies all across Nigeria, with the intention of expanding further training facilities and academies in the country to increase access to education. As of 2006 there were 1,320 students in training in these institutions.

Radio and television in distance learning

NOUN is currently working on a radio facility donated by the Commonwealth of Learning and will start airing some of their courses using that medium within the next six months. A British consultant is assisting NOUN to launch the facility.

UNESCO is also providing support to launch the Radio for Literacy Project for Nigeria. The project is intended to impact 60 million illiterate Nigerians with 12 states of the federation involved in the pilot phase.

The Government of Nigeria has also ceded the educational unit of the Nigeria Television Authority (NTA) in Tejusho, Lagos, to NOUN to enable it to televise some of their courses. NOUN already uses video-conferencing for some course deliveries by making students gather in study centres and interactively participate in class activities with facilitators in remote locations.

Girls and non-formal education

Nigeria is confronted with a persistent problem in girls' education, principally in the northern and rural areas, because of traditional beliefs and roles reserved for girls in the family and religious set-ups. This has prompted government to embrace gender equity programmes in

education. However, to date, school enrollment disparities still exist in the rural and northern areas.

Attempts have been made through the adult education programmes to address women's education issues as well as those of men and boys who are school dropouts. The establishment of the National Commission for Mass Literacy, Adult and Non-formal Education in 1990 improved the delivery of adult education in the country. Currently 30 tertiary institutions train adult education instructors and nine states have established income-generating skills centres.

Adult education programmes cover basic literacy, post-literacy, women's, workers', vocational, and nomadic education. Between 1990 and 2000, 7.2 million adults (55% men and 45% women) were educated.

Poorly paid part-time instructors, lack of instructional and physical infrastructures, and the missing links between the economy and the skills set provided in adult education hamper a potentially well-designed programme.

UNESCO, DFID, and UNICEF are among the various donors assisting Nigeria.

Policy, initiatives, and reality

The ICT revolution is yet to attain that critical mass required for it to register the necessary impact in the teaching, student, and civilian population nationwide. Whilst OAU, UNIJOS, and the FCE in Omoku could be said to be in the vanguard, the majority of Nigeria's universities, polytechnics, nursing and midwifery schools, and colleges of education lack computers.

Many of the lecturers in these public institutions have to go to commercial cyber cafés before they can have access to a computer. The private universities are better off since the majority of them, for example the ABTI-American University of Nigeria (AAUN), has 24-hour Internet connectivity on campus, and each student is provided a laptop with the cost factored into the fee structure. The AAUN fee is beyond the means of most Nigerians.

The activities of NITDA, ETF, SchoolNet Nigeria, and other stakeholders, as well as the partnerships with CISCO and Microsoft, should gradually move the nation towards the realisation of its ICT vision as network operators and software developers take advantage of the opportunities offered to acquire essential expertise and technology in their areas of endeavour to help initiate generalised Internet usage. It is then that e-learning and ICT application to education in general may come of age in Nigerian schools.

Implementing ICT in Education: What Helps and What Hinders?

Table 3 lists the core factors and provides a summary of the current state of development in Nigeria in terms of enabling or constraining ICT applications in the education system.

Table 3: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features	Risk Factors
ICT deployment	• Launching of NIGCOMSAT-1 in	• The low percentage of teachers who have ICT	• Inadequate motivation of

	May 2007 and connection to the SAT-3 submarine cable to reduce telecommunication and Internet connection rates • Investment of the private mobile telephone companies in fibre optic networks to enhance the deployment of Internet services and facilities especially in urban areas • Tertiary institutions and other schools involved in widening access to computer technology and knowledge • Nigeria will be a net supplier of electric energy by 2008 • Agreements with Microsoft, CISCO, and other stakeholders to spread the knowledge and usage of ICT including the production of Nigerian language versions of Microsoft products • Computers and blended learning being used in the distance learning programmes of some teacher-training institutions as well as NOUN	skills and the challenge of the massive ICT education drive needed to correct and develop the huge human resources base at national and institutional levels in the faculty and student populations • The lack of requisite telecommunications infrastructure capable of transporting multimedia messaging • The absence of electric power grids in most parts of the country even in cases where there is adequate telecommunications coverage • Uneasy access to computer equipment and other accessories at institutional and personal levels due to locations of cyber cafés in commercially profitable communities to the detriment of semi-urban or rural communities	government authorities and school administrators to implement the ICT policy in relevant education sectors • Lack of financial resources at government level • Inability of government to extend ICT infrastructure due to financial and budgetary constraints • High levels of illiteracy among women and the northern populations hamper programmes even in the ethnic languages
Technical and vocational education (TVET)	Government and UNESCO reviewed and re-oriented TVET and have equipped several institutions to train teacher-trainers in 28 disciplines in seven staff development centres. Already 527 staff are trained in 34 training workshops.	Government budgets do not permit meaningful provision for these initiatives.	Future absence of international donor technical assistance may stall progress in the programmes and defeat the purpose since less than 1% of post-secondary education is in TVET.

Gender equity	Government and society are involved in the campaign and programmes for girls' education, especially in the northern and eastern states.	Traditional daily household demands still take priority over girls' education especially in the northern states.	The bridging of girls and boys enrolment ratios is a daunting task in light of current enrolment statistics.
ICT policy and implementation	The university and some institutions establish computer laboratories with support from external sources.	The absence of policy at the ministerial level has not helped co-ordinate ICT projects and programmes being carried out separately by various agencies operating in the education sector, and will lead to resource wastage and duplication.	

Notes

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ICT in Education in Rwanda

by Glen Farrell
April 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

The findings, interpretations and conclusions expressed herein are entirely those of the author(s) and do not necessarily reflect the view of *info*Dev, the Donors of *info*Dev, the World Bank and its affiliated organizations, the Board of Executive Directors of the World Bank or the governments they represent. The World Bank cannot guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply on the part of the World Bank any judgment of the legal status of any territory or the endorsement or acceptance of such boundaries.

It is expected that individual *Country Reports* from the *Survey of ICT and Education in Africa* will be updated in an iterative process over time based on additional research and feedback received through the *info*Dev web site. For more information, and to suggest modifications to individual *Country Reports*, please see www.infodev.org/ict4edu-Africa.

Overview

ICT is central to Rwanda's Vision for 2020, and ICT in education is one of the core pillars of the country's National Information and Communications Infrastructure Policy and Plan, adopted in 2000. Tremendous progress has been made since then and the country continues to receive plaudits and support from its development partners. The pace of development of a national ICT infrastructure is remarkable as is the progress within the education system on disseminating computers and providing connectivity and teacher training. Moreover, there is a nationwide effort to provide universal access to both infrastructure and the Internet in order to facilitate ICT4D in the broadest sense.

Country Profile

Rwanda, a landlocked country with a painful history, is one of the world's poorer nations. However, it has made remarkable progress over the last decade in economic growth, increases in per capita income, and decreases in poverty levels. As well, it boasts the highest proportion in the world of female members of parliament at 48%. Rwanda is well on the way to meeting the Millennium Development Goals (MDGs) for education and is successfully containing the spread of AIDS. Over one-third of the national budget is spent on health and education.[2]

Table 1 provides some selected socio-economic indicators for the country.[3,4]

Table 1: Socio-economic Indicators: Rwanda

Indicator	
Population	9 million
Languages	English, French, Kinyarwanda, Swahili
Adult literacy rate	64.9% (age 15 and over)
Economic activity 2005 (percent of GDP)	Agriculture: 42.2% Industry: 20.2% Services: 37.7%
Human Development Index	158 (out of 177 countries)
Human Poverty Index	67 (out of 102 countries)
Per capita gross national income (US dollars)	$200 (2003); $210 (2004); $230 (2005)

According to the World Bank,[5] Rwanda receives about 60% of its annual public spending from about 10 significant bilateral and multilateral donors. About half of this amount is provided through budget support from the African Development Bank, DFID, the European Commission, Sweden, and the World Bank. The remainder comes via projects using parallel delivery mechanisms and donor procedures that are funded by the above donors as well as by Belgium, Germany, the Netherlands, the UK, the USA, and various

UN programmes and Global Funds.

The 2000 report from the Ministry of Finance and Economic Planning, Rwanda Vision 2020, was adopted by the government in 2002. It sets out a vision for the country along with strategies that focus on education and human resource development through the use of ICT.[6]

The Education System[7]

Three years of pre-primary education is available in Rwanda, followed by six years of free compulsory primary education. Fees for primary education were abolished in 2003. As mentioned previously, Rwanda is well on the way to meeting the education MDGs, with net primary enrolment at 94%, and the ratio of girls to boys enrolled in primary schools at 100% (see Table 2 below).

Secondary education is divided into two levels. The lower level is a three-year programme of general studies for all students following primary education. The higher level, also three years, offers both academic and technical/vocational options.

Tertiary education is offered by the country's six public and 14 private universities as well as by specialised public and private institutes. The National University of Rwanda (NUR) and the Kigali Institute of Science and Technology (KIST) are particularly noteworthy in terms of ICT in education – NUR because of its academic excellence in ICT and KIST because of its ICT training mandate and its partnership with the African Virtual University (AVU).

While most schools and institutions of higher education come under the jurisdiction of the Ministry of Education, the churches are also significant providers.

Table 2 provides a quantitative perspective of some selected system indicators.[8]

Table 2: Selected Education Data

Indicator	
Primary enrolment (% gross)*	110 (2003); 119.2 (2004)
Secondary enrolment (% gross)*	11 (2003); 14.3 (2004); 16 (2005)
Primary completion rates (% of 6-to12-year age group)	22.4 (2003); 37.4 (2004)
Tertiary enrolment (% gross)*	1.7 (2003) 2.7 (2004)
Ratio of girls to boys in primary and secondary (%)**	99 (2003); 100 (2004)

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**Ratio of girls to boys is the percentage of girls to boys enrolled at primary and secondary levels in public and private schools.

ICT Policies

The Government of Rwanda has set a national goal that the country will achieve middle-income status by 2020 based on an information-rich, knowledge-based society and economy, achieved by modernising its key sectors using ICT. This vision, developed through a national consultative process that began in 1998, is the driving force for policy development across government ministries, public institutions, and with the country's development partners.

National

Rwanda promulgated its national ICT policy in 2000. It is based on a document that was released in 1999 for national debate and consultation, "ICT-Led Integrated Socio-economic Development Framework." The policy is being implemented in four 5-year rolling plans, which are referred to as the National Information and Communications Infrastructure (NICI) plans. Phase One (NICI-2005) began in 2001 and concluded in 2005. The development of the plan for Phase Two (NICI-2010) built on the achievements of Phase One. The Phase Two Plan,[9] launched in 2006, is structured into sub-plans, each representing one of the following 10 pillars:

- ICT in education
- Human capacity development
- Infrastructure, equipment, and content
- Economic development
- Social development
- E-government and e-governance
- Private sector development
- Rural and community access
- Legal, regulatory, and institutional provisions and standards
- National security, law, and order

The partners working with the Government of Rwanda in the development of its national ICT policies include the Economic Commission for Africa, USAID, UNDP, and the Carnegie Foundation.

The structures[10] to develop and monitor the NICI plans were established in Phase One. These include the National Information Technology Commission (NITC) and the Rwanda Information Technology Authority (RITA). The first, NITC, is chaired by the president; its mission is to lead the process of creating the Rwandan information society and economy in line with the aspirations of the 2020 Vision. It is also responsible for policy and programme monitoring and evaluation. RITA is an autonomous agency under the direct supervision of NITC. It is the main body in charge of actually implementing the ICT policies and all of the associated projects and programmes – including human development. It also acts as the secretariat for NITC and has administrative links and working relations with the Office of the President, the Prime Minister's Office, and the Ministry of Public Works, Transport and Communications (the sponsoring ministry). RITA's primary role is to enhance public awareness about ICT and, through its National

Computing Centre, provide consulting services to the government and to public and private sector organisations. RITA is implementing its mandate through a series of strategies that relate to each of the four NICI plans.[11]

The Rwanda Development Gateway Group[12] is another facet of the national facilitating structure. This is a group of three "ICT for development" initiatives under the Ministry of Education, Science, Technology and Scientific Research (MINEDUC) being funded by the government, which include the following:

- The Rwanda Development Gateway (RDG), hosted by the National University, which is establishing a national portal to provide one-stop shopping for information on Rwanda and to be the country's Web interface to the rest of the world
- The Centre for Geographic Information Systems and Remote Sensing, also hosted by the National University
- The Regional ICT Training and Research Center (RITC),[13] hosted by KIST, which provides ICT training for government staff, teachers, school leavers, and staff in institutions of higher learning

Education sector

ICT in education policy, along with detailed implementation strategies, are defined in each of the quinquennial NICI plans for action by the Ministry of Education – supported and monitored by the national facilitating agencies described above.

The sub-plan for education in NICI-2010 sets out a number of policy action items and associated planned actions that include time frames, budget estimates, and expected benefits. The planned actions, with leadership assigned to the Ministry of Education (sometimes in collaboration with other agencies), are listed below. Some of these are new, while others relate to planned actions in NICI-2005 that have been updated and revised. Others have been rolled forward from the NICI-2005 plan into the NICI-2010 plan because implementation is continuing.

- Train primary and secondary teachers on ICT in education
- Establish a national library network
- Develop new e-learning content
- Implement an educational management system (EMIS)
- Survey educational software appropriate for Rwanda and translate to Kinyarwanda
- Convert existing computer-based training and e-learning content to Kinyarwanda
- Develop programmes to promote the acquisition of computer equipment by educational institutions
- Develop a comprehensive policy on computer education in schools
- Develop a national SchoolNet to provide access to the Internet for schools, facilitate sharing of learning resources, facilitate electronic distance education within the school system, and link Rwandan schools with schools internationally
- Develop a national computer curriculum for primary and secondary schools and co-ordinate its implementation
- Train a critical mass of computer literate teachers

- Develop a national programme to speed up the deployment and use of ICTs in higher education institutions (A specific component is the establishment of a Rwandan Academic Research Network that links all institutions and provides a gateway to the Internet.)
- Develop a national electronic distance education and training programme that supplements and complements campus-based education at all levels, facilitates lifelong learning, and encourages in-service training in both the public and private sectors
- Develop special ICT-in-education initiatives for academic exchanges and twinning, implementation of the SMART schools concept, and penetration of ICT into rural schools
- Establish a regional information technology training and research institute to serve Rwanda and the sub-region

The Ministry of Education has begun work on many of these action plans and in March 2006 tabled a draft ICT policy that identified the following four areas of focus:

- Developing an understanding within the system of the value of technology and the need for investment
- Developing procurement and installation strategies
- Implementing an EMIS
- Developing and managing content and integrating it into the curriculum

The Kigali Institute of Education (KIE),[14] started in 1999, with funding from the government and numerous donors such as the World Bank, the Swiss Co-operation, DFID, USAID, and UNESCO, has become an important teacher-training institution. KIE's mission is to train secondary school teachers and faculty in teacher-training colleges and technical schools.

Infrastructure

National

Creating access to ICT infrastructure is at the heart of Vision 2020, and the government is being widely recognised and applauded for the achievements since the promulgation of its ICT policy and plans.[15] However, there remain plenty of challenges: the extent and quality of ICT infrastructure and access to the Internet varies widely, computer hardware is in short supply, the skilled resource pool is small, and financial resources are scarce.

Findings from a recent feasibility study[16] on community information centres (CICs) are indicative of the task ahead. Although the idea of setting up CICs appeals to Rwandans, the study findings reveal that only 7% of the population have ever used the Internet, and 71% have never even heard of it – not surprising given that the vast majority of Rwandans live in rural areas.

Table 3 provides a snapshot of the state of national ICT infrastructure as of 2004 (note, however, that there has been considerable development over the last two years).

Table 3: ICT in Rwanda[17,18]

ICT	
Telephone main lines (per 1,000 people)	2 (2000) 3 (2004)
Mobile subscribers (per 1,000 people)	5 (2000) 16 (2004)
Population covered by mobile telephony (%)	65 (2004)
Internet users (per 1,000 people)	1 (2000) 4 (2004)
Personal computers (per 1,000 people)	4 (2004)
Households with television	2 (2000) 2 (2004)
VSAT providers (broadband)	15
Private FM stations	8
Private TV stations	2

Rwanda Terracom, founded in 2004 as a private company, has been the national telecom service provider and has been developing a state-of-the-art fibre optic network connecting schools, hospitals, and government buildings in Kigali.[19] The next step will be to extend the network to the next four largest cities – more than half the population. Base stations will allow wireless connections to the cable from several kilometres away. Anyone who is patched in will benefit from data transfer speeds of up to 2 Mbps that will offer phone, Internet, and television services. This network, together with the highest VSAT density of any African country, will enable every household to have a mobile phone within the next two years. In July 2007, the government of Rwanda announced that it will take over Terracom, buying back all shares in Terracom from its private owners and changing its name to Rwandatel.[20] While not the primary reason for this decision, government dissatisfaction with the slow pace of the roll-out of Internet connectivity to schools was a contributing factor.

Education

In 2000 just one school in the country had a computer. Six years later over half of primary and secondary schools have been equipped with hardware, over 2,000 teachers have received ICT training, and all public schools are expected to join the information superhighway by the end of 2008. Already, out of the 400 secondary schools that have been fully equipped, 39 of them having wireless Internet access.[21] The national SchoolNet project included in the NICI-2010 plan is intended to be the vehicle for school connectivity.

A non-binding schools agreement has been signed with Microsoft for the use of their software in Rwandan schools at a significantly reduced annual fee from their usual

commercial offerings. This will extend to the use of the Microsoft XP operating system and Microsoft Office.

At the tertiary level, all universities and institutes have computers. The two primary universities, NUR and KIST, are the best equipped with ICT infrastructure consistent with their mandates to provide leadership in achieving Vision 2020. However, all universities are independently connected to the Internet in various ways such as fibre optic cable, wireless broadband (Wi-Fi), leased lines, and VSATs. There is no direct inter-university connectivity, and most Internet traffic is focused on international Web sites that are costly and slow to access due to expensive and limited international bandwidth. However, this is about to change with the development of the Rwanda Education and Research Network (Rwednet),[22] which will enable broadband access for all higher education institutions and research centres. As well, there is hope that, with assistance, this access can be expanded to link secondary schools and, potentially, primary schools as well. Rwednet will be part of the UbuntuNet Alliance for Research and Education Networking, an association of national research and education networks (NRENs) across Africa.

Current ICT Initiatives and Projects

Table 4 summarises the current and recent ICT initiatives and projects in Rwanda.

Table 4: ICT Initiatives and Projects

Project: Market and employment information dissemination via FM radio stations throughout the country. • *Organisation(s)/funding sources*: FM coverage is excellent and radios are generally affordable. FM stations provide this service as a contribution to poverty reduction. • *Geographic scope and time frame:* Countrywide; ongoing. • *Contact:* Gahamanyi Jacob, www.rwandagateway.org
Project: HIV/AIDS and other health information is provided to clinics and health workers around the country via cell phones using an Internet platform. • *Organisation(s)/funding sources*: TRACnet, under the leadership of the Ministry of Health, and the Centre for AIDS Treatment and Research (TRAC), are the primary organisations. RwandaTel and MTN-Rwandacell provide toll-free numbers and donate network time to support TRACnet. • *Geographic scope and time frame:* National; launched in 2005. • *Contact:* www.earthinstitute.columbia.edu/news/2005/story10-28-05.html
Project: Distance education programmes are offered by the AVU in collaboration with NUR and KIST. KIE hosts a programme for training under-qualified secondary school teachers. Foreign institutions offer programmes in information management, information technology, and business management • *Organisation(s)/funding sources*: In addition to the AVU and its Rwandan partners, the

University of South Africa, in partnership with KIE, and the University of Australia (with KIST), offer programmes. Others are offered directly by European and American institutions.

- *Geographic scope and time frame:* National;; ongoing.
- *Contact:* Rwanda institutions and Ministry of Education

Project: Rollout of computers to secondary schools: 2,100 computers have already been distributed to secondary schools, and another 2,200 are ready for distribution. The target is to continue distribution at 300 computers per month.

- *Organisation(s)/funding sources*: Ministry of Education; Rwanda Network Computer, a Kigali based company, is building the computers.
- *Geographic scope and time frame:* National; launched in 2005.
- *Contact:* Ministry of Education

Project: ICT training in basic skills for 3,000 secondary school teachers carried out in partnership with Microsoft Partners in Learning (PIL) using a trainer-of-trainers model.

- *Organisation(s)/funding sources*: RITC and PIL managed the project. PIL, Microsoft Emerging Markets Team, RITC, and the Ministry of Education provided the funding.
- *Geographic scope and time frame:* A national project in 2005.
- *Contact:* Ministry of Education

Project: In-depth ICT training 1,000 secondary school teachers: The objective was to following on from the basic skills training to train two teachers per school with higher-level skills such as troubleshooting and fault-finding. These teachers are expected to train other teachers in the schools.

- *Organisation(s)/funding sources*: RITC managed the programme with funding primarily from the Ministry of Education.
- *Geographic scope and time frame:* National; 2006.
- *Contact:* Ministry of Education

Project: Content development: Fifteen NCDC curricula developers were selected for training in the development of digital curricula. Trainers from World Links provided the first course, which was followed by an intensive six-day course using expert trainers from Learnthings that included a follow-up six-month mentoring programme of on-line support.

- *Organisation(s)/funding sources*: The NCDC managed the project with funding from PIL. Discussions have also been initiated with SUN Microsystems Global Education Learning Community (GELC) for the use of open source curricula content software.
- *Geographic scope and time frame:* Institutional (NCDC); launched in 2006.
- *Contact:* NCDC

Project: Rollout of computers to primary schools: Two desktop computers were provided to 98 primary schools with power, and one laptop plus solar supply provided to another 1,018 primary schools without power. A rollout of up to five computers in each of the 2,200 primary schools in Rwanda is planned over a three-year period beginning in 2007.

- *Organisation(s)/funding sources*: World Links provided the first phase, and costing of phase 2 is underway. UNESCO, the World Bank, and the African Development Bank have supported the rollout of computers in schools generally, particularly to assist in the teaching of science.
- *Geographic scope and time frame:* National; 2002 to 2005.
- *Contact:* Ministry of Education.[23]

Project: Training of primary school teachers in computer skills: Two teachers in each of the schools equipped with a computer were trained in basic computer literacy who then trained colleagues. A total of 2,216 teachers were trained.

- *Organisation(s)/funding sources*: World Links provided the training in collaboration with the Ministry of Education (MINEDUC). This training programme will be continued in line with the MINEDUC programme to roll out computers to primary schools.
- *Geographic scope and time frame:* National; 2002 to 2005.
- *Contact:* MINEDUC

Project: Microsoft Pathfinder programme: A new initiative from Microsoft for a pan-African partnership network for sharing knowledge and providing training in ICT.

- *Organisation(s)/funding sources*: Microsoft, RITA, and MINEDUC.
- *Geographic scope and time frame:* To be announced.
- *Contact:* RITA

Project: Phase 1 of NEPAD e-Schools Initiative: A demo project that includes six schools in Rwanda. Private sector consortia are providing the components to equip the schools with the latest ICT technology, including full Internet capability, a media centre, content, and e-curricula.

- *Organisation(s)/funding sources*: CISCO and Microsoft
- *Geographic scope and time frame:* Six sites are being targeted from 2005 to 2007.
- *Contact:* MINEDUC

Project: Hundred dollar laptops: The government will collaborate with the One Laptop Per Child (OLPC) non-profit association to test the applicablilty of the technology. There will be no cost to Rwanda.

- *Organisation(s)/funding sources*: Ministries of Infrastructure and Education and the Minister of Science and Technology and Research in the President's Office.
- *Geographic scope and time frame:* TBA
- *Contact:* MINEDUC

Project: KIST: an intensive programme to train ICT technicians to maintain hardware, software, and networks, aiming to build local capacity to maintain the ICT infrastructure through staff upgrading. KIST has also introduced a CISCO Network Academy Programme and Microsoft Certification Programme.

- *Organisation(s)/funding sources*: In collaboration with DFID.
- *Geographic scope and time frame:* National; ongoing.
- *Contact:* www.schoolnetafrica.net/1409.0.html

Project: A programme to establish telecentres in the country has been launched as a way of improving access to information, to enhance educational standards, and to foster human resource development.

- *Organisation(s)/funding sources*: RITA is the lead agency. The government has earmarked USD$1 billion.
- *Geographic scope and time frame:* National; began in 2006.
- *Contact:* http://english.peopledaily.com.cn/200603/29/eng20060329_254425.html

Project: Support to village phone operators (VPOs) to operate businesses where no telecommunications services exist. The concept, pioneered by the Grameen Foundation, assists

the VPOs to rent their phone to their community on a per-call basis. They provide affordable rates to their patrons while earning enough to repay their loans and earn profits.

- *Organisation(s)/funding sources*: Village Phone Rwanda was created as a joint venture between the Grameen Foundation and MTN Rwanda.
- *Geographic scope and time frame:* Currently located in 14 of 30 districts. The goal is to have over 3,000 VPOs by 2009.
- *Contact:* www.grameenfoundation.org/where_we_work/sub_saharan_africa/rwanda/village_phone_rwanda

Implementing ICT in Education: What Helps and What Hinders?

The core factors that influence the adoption and diffusion of ICTs in education have been identified in many studies and project reports such as the UNESCO *Meta-survey on the Use of Technologies in Asia and the Pacific*[24] and, in the context of East Africa, by IDRC in its thorough analysis of ICT policy-making in the region.[25] Two other studies that have discussed some of these factors in the higher education sector are those carried out by the United Nations National University[26] and by the African Virtual University.[27] What emerges from these analyses is that the factors are essentially the same in both developed and developing economies, although they differ in terms of importance depending on which side of the "digital divide" they are viewed from. What differentiates the rate of adoption and diffusion is not the factors at play, but rather the degree to which they have been developed or are present in a given country.

Table 5 provides a summary of the current stage of ICT development in Rwanda in terms of enabling or constraining features in the education system.

Table 5: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation plans	The scope and detail of the NICI plans for achieving Vision 2020 provide clear, meaningful direction and have captured a broad base of donor support.	
Advocacy leadership	The president is providing clear visionary leadership and has strong support from his colleagues in government and from officials at all levels.	Long-term success will depend on continuing stability and support for Vision 2020 and the spending priorities needed to achieve it.
Gender equity	Strong emphasis on the NICI plan. Evidence is that goals are	Female participation rates drop off at tertiary levels.

	being met in primary and secondary schools. Several non-formal education projects target rural women.	
Infrastructure and access	The rate of development is remarkable and the goal of universal access within the NICI-2010 plan has wide appeal.	Rwanda is still a predominantly rural society with lack of access to electric power, equipment, and trained teachers in schools, and lack of awareness of ICT generally.
Collaborating mechanisms	The NICI planning process, although managed centrally, is highly participatory with implementation decentralised to facilitating structures such as RITA, RITC, the line ministries, and various lead institutions such as the NUR.	
Human resource capacity	The NICI-2010 plan emphasises the importance of developing this capacity.	People with the requisite skills to contribute to the development processes are currently in short supply.
Fiscal resources	The government's spending priorities are consistent with its vision and implementation plans.	Rwanda is a poor country so it remains dependent on donor partners.
Learning content	Development and acquisition of digital content in all official languages is identified as a priority in the NICI-2010 plan.	Digital content is currently lacking.
Procurement regulations	The government has put policies in place that encourage and enable procurement domestically and from international sources.	
Attitudes	Strongly positive within government and the education system.	Most rural Rwandans are unaware of ICT and its potential for development.
Sustainability	Plans are based on achieving a sustainable, ICT-based economy.	Rwanda will continue to need the support of partners until those goals are achieved.

Notes

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ICT in Education in São Tomé and Príncipe

by Babacar Fall
June 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

The findings, interpretations and conclusions expressed herein are entirely those of the author(s) and do not necessarily reflect the view of *info*Dev, the Donors of *info*Dev, the World Bank and its affiliated organizations, the Board of Executive Directors of the World Bank or the governments they represent. The World Bank cannot guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply on the part of the World Bank any judgment of the legal status of any territory or the endorsement or acceptance of such boundaries.

It is expected that individual *Country Reports* from the *Survey of ICT and Education in Africa* will be updated in an iterative process over time based on additional research and feedback received through the *info*Dev web site. For more information, and to suggest modifications to individual *Country Reports*, please see www.infodev.org/ict4edu-Africa.

Overview

The government of São Tomé does not consider ICT to be a priority sector, and there is currently no specific policy that addresses ICTs. Internet service is not yet liberalised, but there is some restructuring of telecommunications infrastructure underway.

Country Profile

The Democratic Republic of São Tomé and Príncipe consists of two islands and four islets. The country took its name after those islands, which are located on the west of the African continent in the Gulf of Guinea. The das Rolas islet is the most important of the four and is situated in south of the island of São Tomé. This South Atlantic archipelago is 350 kilometres from the Gabonese coast. The surface area of São Tomé is 859 square kilometres and that of Príncipe is 142 square kilometres for a total of 1001 square kilometres. The distance between the two islands is about 160 kilometres.[2]

São Tomé and Príncipe is a former Portuguese colony with 133,600 inhabitants (2005) and a population density ranging from 3.145 people per square kilometre in Agua Grande to 21 per square kilometres in Caué. Over half (54.5%) of the population is concentrated in urban zones, leaving 45.5% in rural zones.

The economic structure is characterised by a strong dependence on outside sources and on cacao, the sole export product.

Table 1 provides some selected soci-economic indicators for the country. [3]

Table 1: Socio-economic Indicators: São Tomé and Príncipe

Indicator	
Population	133,6000
GNP per capita	290
Televisions per 1,000 people	228
Radios per 1,000 people	318
Fixed telephone lines per 1,000 people	36
Internet users	9,000

The Education System

The National Action Plan that has been developed is seen as a mechanism for strategic action for reaching the Millennium Development Goals. However, the implementation of the plan will require an infusion of resources from international partners.

Formal education[4]

The education system in São Tomé and Príncipe, currently regulated by LSBE-Decree-Law #53/88, has long suffered from multiple modifications. This system consists of the five following sub-systems:

- General schooling, with pre-school, elementary school, secondary school, special and professional school
- Professional and technical education
- Training and improvement of teaching executives
- Adult education
- Higher education

Table 2 summarises some basic education data.

Table 2: Education Data (2004)

Indicator	
Primary completion rate, total (% of relevant age group)	74.9
School enrolment, primary (% gross)*	132.9
School enrolment, secondary (% gross)*	40.2
Ratio of girls to boys in primary and secondary (%)**	99.3

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**Ratio of girls to boys is the percentage of girls to boys enrolled at primary and secondary levels in public and private schools.

Non-formal education

There are several initiatives and approaches in the non-formal education domain. São Tomé has a national radio station that broadcasts 17 hours a day and a national television channel that broadcasts five to six hours a day. As well, since 1999, a new regional radio station on Príncipe has started broadcasting.[5]

In these initiatives, the educational activities oriented towards literacy are a means to giving a fresh start to rural development objectives.

ICT Policies

There is currently no specific policy that addresses ICT in São Tomé and Principe.

Infrastructure

Telephones

The international telephone network is connected via an underground system called INTELSAT. The main operator for fixed telephone lines is Companhia Santomense de Telecomunicaçoes (CST), which is 5% controlled by Portugal Telecom

(http://www.cstome.net/). The number of fixed telephone lines in 2003 was 7,000, with a density of 4.6%.

The main mobile phone service provider is Portugal Telecom. The number of mobile phone subscribers is 4,800, with a density of 3.17%. Competition was supposed to open in 2006 for the mobile telephone market in São Tomé and Príncipe.

Internet
Internet service access is not yet liberalised, in contrast with the majority of African countries.[6]

CST is currently the main Internet service provider. It operates through TELEPAC, a branch of Portugal Telecom. It also offers connections through Wi-Fi. With local and Swedish funds, Bahnhof ST (http://www.bahnhof.st/index.html) is going to offer wireless access from an underground station. It already offers electronic message service and Internet site hosting.

Table 3 summarises the Internet connection data of the country.

Table 3: Internet Connection

Indicator	
Number of Internet service providers	1
Technologies used	RTC, Wi-Fi
Number of servers per 10,000 people	62.5
Total number of Internet users	20,000
Users per 100 people	12.2

The restructuring of the telecommunications sector is in progress. CST lost its monopoly over Internet service and data transmission in 2004 and over the fixed and mobile telephones in December 2005.

ICTs in Education

The Polytechnic Institute (Institut Supérieur Polytechnique) is the only public school at the tertiary level. The institute has a computer laboratory.

There are about 30 computers in the institute, 20 of which are quite recent and installed in two rooms (12 in one room and eight in another). The room with eight computers is connected to the Internet. The two rooms are supervised by foreign co-operation assistant teachers working with local teachers. These rooms are especially reserved for computer classes that are part of the syllabus for all training sections. The syllabus ranges from word processing to the use of the Internet as a research tool. The two rooms can host up to 40 students at one time pairing up.

There is no fax machine at the national high school. Instead, it has a special 28 kbps line connection to Internet. The e-mails are often lost in the network, and communication is difficult. By and large, there is now a political will to extend the network and develop the technical capacities in the country and especially in the schools. In this regard, the Netescolas project envisions to upgrade the high school Internet connection to 64 kbps[7]

Bahnhof ST offers free online training to all qualified students through the Bahnhof ST Internet School.

Current ICT Initiatives and Projects

The government does not consider ICT to be a priority sector. Nevertheless, these technologies offer an essential instrument for sharing information and knowledge, paramount for efficient and modern management of the limited resources of the country, essential conditions to a good governance.

The strategic objectives of the government are to transform ICT into a service instrument used to reduce poverty and to attain the Millennium Development Goals. In the perspective of this political choice, one can include UNESCO's Participation Programme which has run for about 10 years and extends to formal and non-formal education. This programme, designed to provide direct assistance to initiatives undertaken by member states in the organisation's fields of competence, in line with priorities determined by the countries themselves, included a communication project in São Tomé and Príncipe from 1994 to 2003. The project was designed to use radio transmissions for improving formal and non-formal education and animating school-community interactions.[8]

The government expects to conduct a study for connecting São Tomé and Príncipe to a network of underwater optical fibres. This is a way for the country to reduce the costs and improve the quality of access to telecommunications. This connection will allow the transformation of the country into a service centre for the region and the creation of infrastructure conditions that will attract private investment into the country.

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in São Tomé and Príncipe in terms of enabling or constraining features in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation		There is no specific policy that addresses ICT.
Advocacy leadership		ICT is not a priority sector.
Gender equity		There is gender inequity for access to

Factors	Enabling Features	Constraining Features
		ICT.
Infrastructure and access		Internet service access is not yet liberalised
Policy and collaborating mechanisms	The strategic objectives of the government are to transform ICT into a service instrument used to reduce poverty and to attain the Millennium Development Goals through popularising ICT.	
Fiscal resources		There are high taxes placed on computers and connectivity.

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ICT in Education in Senegal

by Babacar Fall
June 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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Overview

Senegal's hands-on commitment to incorporating ICT in education is still in the beginning stages of progress and evaluation. Although Senegal's public officials and government bodies recognise ICT as a powerful engine for progress in economic expansion and modernisation and have a national ICT policy in place, it has not yet been integrated into the education sector in any kind of formal policy. However, the Ministry of Education and several organisations have taken initiatives to launch and continue activities that will facilitate the modernisation of schools and other educational institutions. Initiatives have also been made in the informal sector, such as the UNESCO Community Multimedia Center Scale-Up Project, to make ICT accessible to community members. Although obstacles remain, such as the need for more telecommunications infrastructure and computer materials, the outlook for integrating ICT into Senegal's education system is very optimistic.

Country Profile

Senegal is located on the westernmost point of the African continent, along the Atlantic Ocean. With a surface area of 196,722 square kilometres, it is bordered by Mauritania to the north, Mali to the east, Guinea and Guinea-Bissau to the south, and 500 kilometres of Atlantic Ocean coastline to the west. The Gambia forms a partial enclave within Senegal, extending more than 300 kilometres inland (and separating the region of Casamance from the rest of the country). Dakar, its capital, is on a peninsula located in the far west, which extends over 550 square kilometres.

Table 1 provides some selected socio-economic indicators for the country.[2]

Table 1: Socio-economic Indicators: Senegal

Indicator	
Population	10,564,303 (2004)
Education rate (elementary education)	82.5%
Literacy rate	39.3%
Number of students in elementary school	1,444,163 (2005)
Number of students in middle school	311,863 (2005)
Number of students in high school	89,187 (2005)
Life expectancy at birth	51 years
Gross national product per capita	470
Rate of urbanisation	41%

The Education System

Senegal's education policy is based on Law 91-22, enacted February 16, 2001. It distinguishes between formal and non-formal sectors in the Senegalese educational system.

Formal education

Formal education comprises several levels and types of schooling: pre-school, elementary school, middle school, high school, technical and vocational training, and higher education (universities and colleges). There are public and private providers within each of these levels of education. However, the number and diversity of the private providers has increased since 1990 – particularly in higher education.

Likewise, special education (integrative and other kinds) is becoming more and more important in the system. Even though its presence is stronger in elementary schools, trends in the development of this sector are towards better coverage of previously neglected school-age populations.

Informal education
The informal education sector includes literacy development, basic community schools, and less conventional schools (often grassroots). The latter two types of education are under experimentation.

Tables 2 and 3 provide data on attendance at both middle and high schools.[3]

Table 2: Rate of School Attendance in Middle Schools, 2005

	School-age Population	Population in School	Percentage
Boys	472,597	176,920	37.40%
Girls	505,887	134,943	26.70%
Total	**978,484**	**311,863**	**31.90%**

Table 3: Rate of School Attendance in High Schools, 2005

	School-age Population	Population in School	Percentage
Boys	376,264	53,736	14.30 %
Girls	440,438	35,451	8.00 %
Total	**816,702**	**89,187**	**10.90 %**

ICT Policies

National
Policymakers recognise the value of ICT for Senegal's economic and social development, and the government recognises ICT as a powerful engine for progress in economic expansion and modernisation.

Since 2000, the following legal and institutional measures have been taken:

- Definition of a national strategy for developing ICT [4,5]
- Adoption of a new telecommunications code
- Creation of an agency in charge of overseeing telecommunications
- Creation of the State Computer Science Bureau
- Creation of a ministry responsible for the promotion of ICT

- Complete liberalisation in the telecommunications sector

Additionally, the Programme National de Bonne Gouvernance (National Program for Good Governance) identified ICT as a valuable instrument for improving productivity in public service, enhanced performance, and modern communication.

Electricity is obviously a facilitating factor for using the Internet. Senegal has recorded a great deal of progress in this regard. Currently 38.5% of schools are connected to the electric network, but there is a disparity between rural and urban areas, with only 7.9% connected in the district of Kedougou to 100% in Dakar City.[6]

Senegal possesses modern telecommunication infrastructures. A completely digitised telephone network as well as an Internet protocol network covering a large area of the country is in place. There are 25 fixed telephone lines for every 1,000 residents, and in recent years, there has been a steep surge in mobile telephony, with a total of about 3.5 million users as of February 2007.[7] The number of Internet users is estimated at about 100,000 with a huge increase having occurred in the last two years.

Table 4 provides some recent data on the state of telecommunication in Senagal.[8,9,10]

Table 4: Telecommunications in Senagal

Indicator	
Internet speed	1.24 Gbps
Number of cellular phone users	3.5 million
Number of operators	2 (Orange et Tigo)
Number of land-line telephone users	274,054 (2006)
Televisions per 1,000 people	79
Radios per 1,000 people	126
Land-line telephones per 1,000 people	25
Cellular phones per 1,000 people	31
Personal computers per 1,000 people	18.6
Internet users (in thousands)	100
Community multimedia centres	24

The sector already plays a significant role in the economic and social development of the country, comprising 7% of the Gross Domestic Product (GDP) and 5.4% in total capital. The will to make communication services one of the vehicles for the country's economic and social development has been a goal since the mid-1990s.

The president of the Republic of Senegal, the "first in line" in the fight to reduce the digital gap between the North and the South, enacted an in-depth ICT policy within the Senegalese civil service. The State Computer Science Bureau's Government Intranet Project provides a 1 Gbps network, linking the different departments through optical fibres. Outside services will be connected to this intranet through wireless connection. The telephone lines between departments will be free. The government is also working at the community level, with the support of UNESCO, towards building community multimedia centres (CMCs), to provide radio broadcast and ICT services.

Education sector

With its Ten Year Education and Training Program (PDEF), the Ministry of Education envisions promoting information and communications technology for administrative development and the improvement of education.

The Ministry of Education has designed a computerisation plan (referred to as the PDI-Education Plan) for the educational sector which defines, for each of its activities, an action plan as well as an expected budget to modernise the administration system.

The four main objectives of the plan are:

- Improvement in communication: The demand for better management of the Senegalese education system requires, first and foremost, improvements in internal communications to carry out its missions and responsibilities.
- Improved management of databases: The availability of descriptive data through a projected integrated information system will make it possible to satisfy indicator formats in PDEF reference documents.
- Development of decision-making tools: Web-based tools for making decisions according to each mission, both internal and external (via the Web), will be available to institutions.
- Project sustainability: This will require technical proficiency throughout the entire organisation and will be achieved by recruiting consultants and training civil servants.

Infrastructure

Computers in schools
The computer-to-student ratio is variable. For example, it ranges from 1 to 20 at Mariama Bâ high school of Gorée to 1 to 2,000 at Parcelles Assainies high school. NGOs have been working actively with their francophone partners to supply computers to schools.

Institutional Internet connection[11]
- 100% of universities are connected
- Two-thirds of high schools are connected
- 10% of junior high schools are connected and more are being connected all the time
- 233 schools benefit from the Ministry of Education's arrangement with SONATEL that offers preferential fees to schools;
- At the Université Cheikh Anta Diop de Dakar (UCAD) 100% of teachers and 70% of research teachers have access to Internet
- The Dakar campus of the Arrange University Francophonie (AUF), provides Internet access to up to 500 students a day

Connectivity within the Ministry of Education
A computing unit, called CIME (Cellule Informatique du Ministère de l'Education) was instituted by ministerial decree. It serves all levels of the administrative hierarchy as well as at the Regional Inspectorates and the other ministries concerning education.

The Minister of Education also created a National Commission for the Integration of Information and Communication Technologies (COMNITICE) in the school curriculum.

This commission is responsible, in conjunction with the Ministry's Computer Technology Unit, for promoting the use of technology as a tool for teaching and learning in schools.

Though significant progress has been made for improving the management in terms of administrative organisation and human resources, there is currently no official policy in place for integrating ICT into the Senegalese school curricula and the country is still in the promotion phase.

There is a significant penetration of computer equipment into the Senegalese school system, and the ministry has also taken several other initiatives to facilitate the development of ICT infrastructure:

- The Ministry of Education has partnered with the private sector to provide computer hardware and networks as well as the digitalisation of content and training. The main private partners are SONATEL (the national telecommunications company and subsidiary of France Telecom), Cisco, and Microsoft. The agreement with SONATEL provides schools with a 75% rebate on Internet service. An addendum to this agreement signed in 2004 grants a 50% reduction on subscription fees, and monthly payments for ADSL lines. The monthly payment for a 256 K ADSL now stands at FCFA13,500. SONATEL also supports education through its foundation.
- UCAD has hosted the regional CISCO Academy in Senegal since 2003. The academy was established through a joint partnership between Cisco Systems, USAID, UNDP, and the State Directorate for Computer Technology. Eleven other academies operate in middle schools, high schools, and vocational schools throughout Senegal. For a fee, they offer students and community members a combination of distance and conventional training. The distance education platform is supported by CISCO's Web site (CISCO Networking Academy Program). In all of these centres, CISCO offers practical training to equip students with the skills needed to design, implement, and operate small- or medium-scale networks. The prerequisite for a CISCO academy is the availability of computer equipment. This equipment is generally provided within the framework of a project pursuing pedagogical goals, but used additionally for the training activities of the Cisco Academy. The resource people with the most experience are often used as trainers. The outcomes of this training are very positive since graduates find employment as network technicians.
- Partners in Learning is a protocol between Microsoft and the Ministry of Education that was signed in October 2004. The partnership would make available computer software at a reduced price, develop a Web portal for teachers, and organise a series of training workshops. USAID also partnered with Microsoft to optimise the cost of its support for the Senegalese education system: equipping schools, setting up ICT structures, and partnering between ministry and NGOs and other development agencies. Despite the important issues facing education (access, gender equity, quality), and the economic odds, the government is resolutely committed to the use of ICT in education.
- NGOs such as World Links and GEEP (Group for Studying and Teaching Population) have long been active in providing equipment to schools. For example, the initiative La Case des Tout-Petits, has made it possible for 50 pre-schools to be equipped with computers.

Current ICT Initiatives and Projects

The current socio-political atmosphere is very favourable to the dissemination of ICTs in education. The following are some of the innovative initiatives underway.

African Virtual University

The African Virtual University is an intergovernmental organisation disseminating training courses in collaboration with other African higher education institutions. It provides distance learning courses to support local institutions, thus improving course offerings in response to an ever-increasing demand.

Sinkou

The Sinkou cyber campus, costing a total of FCFA1.2 million, consists of an impressive computer lab equipped with 500 state-of-the-art computers. A high-speed Internet connection through a VSAT antenna opens students up to a world that allows them to enhance their studies and further their research. In its second phase, the project includes Gaston Berger University in Saint-Louis, the

community colleges in Thiès, Ziguinchor, and Bambey, as well as different professional training institutes, high schools, and middle schools. The project funding is FCFA5 billion.

SchoolNet Africa
Since June 2006, SchoolNet Africa, a pan-African organisation specialising in promoting ICT and education, moved its headquarters to the School of Education (Faculté des Sciences et Technologies de l'Education et de la formation) of the University Cheikh Anta Diop of Dakar. As a partner of SchoolNet Africa, GEEP and the School of Education hosted a training workshop to establish technical service centres in francophone African countries to support the sourcing, refurbishment, distribution, and maintenance of second-hand PCs to schools.

Civil Society Projects
Senegal has had learners and teachers participate in civil society type projects such as the Global Teenager Project and the Mtandao Afrika programme. Mtandao Afrika (MAf) Internet Challenge is a Web site contest for African youth aged nine to 12. The contest focuses on the creation of African Web sites with African content and promotes the use of African local languages.

For more information: www.mtandao-afrika.org; mtandao@schoolnetafrica.org

Global Teenager Project
The Global Teenager Project (GTP) aims to enlighten teenage learners about ICTs and to develop their conceptual understanding of the way they can be used to pursue their learning goals – particularly by using the technology to enable worldwide interactions with peers. For example, it enables participants to become part of learning circles in different languages, runs world conferences on global citizenship, and supplies corporate literature.

For more information: www.globalteenager.org

Dakar's Digital Francophone Campus
This partnership between the State, Sonatel, and Salta Service International establishes a network of inter-university and inter-school telecommunication hosted by the UCAD library, RESAFAD-ICTE and the University Information Network Project.

FASTEF
FASTEF (Faculté des Sciences et Technologies de l'Education et de la Formation School of Education) leads a couple of initiatives. The Computer-Education Laboratory offers basic training in computers to the students and teachers involved in the UNESCO programme in educational sciences (CUSE) delivered by distance learning, and the Center for the Application, Study, and Resources in Distance Learning (CAERENAD) is a programme financed by the ACDI.

GEEP
GEEP (Group for Population Studies and Education) is a project testing the installation of "youth cyber spaces" in middle and high schools, run in collaboration with IDRC in Canada in the context of the Acacia Senegal Plan. It was launched in 2000.

EBAD
EBAD (School of Librarians, Archivists, and Record-Keepers) runs a project called FORCIIR, a virtual West African class. It was launched from Dakar in October 2001 and it is made possible through distance education. It offers a degree in information sciences and an advanced degree in information and communication sciences.

Canadian International Development Agency

CIDA is the lead funding agency for several projects that focus on the promotion of ICT use among youth and women, the promotion of distance education, and the provision of support to the development of instructional resources.

USAID
USAID funds a project for incorporating ICT education in the middle school curriculum in the regions of Fatick, Kolda, and Tambacounda.

Japan International Cooperation Agency
JICA provides training for principals and directors via distance education.

Arrange University Francophonie
AUF has created a French-speaking numerical campus in Dakar that provides a Digital Access Centre for students and offers training and Internet access to a worldwide network of 635 higher education institutions.

World Links
This programme assists in the renovation and computerisation of the UCAD library.

Nepad e-Schools Demonstration Project
The first phase of the Nepad e-Schools Initiative aims to have all schools in Africa equipped with ICTs and connected to the Internet, with teachers and school staff fully trained over the next decade. The Demo project is being implemented by a private sector consortia and the project is co-ordinated by Nepad's e-Africa Commission. Six schools in Senegal are participating.

UNESCO CMC Scale-Up Project
Twenty-four community multimedia centres (CMCs) have been set up, and hundreds of thousands of people living in remote rural areas can now access community radio, computers with Internet connection, and Digital devices. The CMCs constitute the most important network of community access to ICT.

Table 5 summarises other projects in Senagal.

Table 5: ICT in Education Projects in Senegal

Institutions	Programmes/projects
National institutions	
ME (Ministry of Education)	PDEF (March 2003 version), number II-6: global strategies for an action plan: Extending the use of ICT by: • Connecting schools to the Internet • Developing computer skills training • Using ICT to improve teaching and learning processes • Using ICT to oversee schools engaged in achieving quality • Designing and implementing a framework for information sharing
ME/DEE (Direction de l'Enseignement élémentaire)	ICT component of DEE action plans for 2005-2007 (phase 2 PDEF)
ME/DEMSG (Direction de	• ICT component of DEMSG action plans for 2005-2007

Institutions	Programmes/projects
l'Enseignement Moyen et Secondaire Général)	(phase 2 PDEF) • SONATEL agreements (special rates for Internet connection, recently ADSL)
ME/CIME Cellule Informatique du Ministère de l'Education	• Plan for ICT development (see document on SDI report, February 2004) • Contract with Microsoft
ME/DEMSG/RESAFAD-TICE	• DUCM • Development of collaborative work spaces • Development of digital content • Establishment of local multimedia centres; the centre in Thiès is currently running • FAD directors
ME/CIME/DEE/CNFIC	Plan to integrate computer technology into school curriculum (The project was conceived in January 2002, but it apparently lacks follow-through.)
ME/COMNITICE	Commission created on 13 May 2003; in charge of reflecting on ICT in teaching/learning in school.
UCAD (Université Cheikh Anta Diop)	• UVA (World Bank) • Dakar's digital francophone campus • Cyber Campus Project (a partnership between the State, Sonatel, and Salta Service International) to establish a network of inter-university and inter-school telecommunication (hosted by the UCAD library, BU) • DUCM (RESAFAD-ICTE) • University Information Network Project
Bilateral institutions and Multilateral co-operation	
ACDI	• CÆRENAD: Promotes distance education • REFORMA: Supports access to instructional resources • ACACIA: Promotes ICT use among youth and women
UNESCO-BREDA	• University of the Future • GT-EDAL ADEA • Distance training for substitute teachers (ENS)
AUF	• DESS UTICEF • Digitised campus
ESMT	ESMT (Multinational School of Telecommunications) offers distance training to reach its goal, which is to broaden its services and to benefit from those occasions that offer information and communication technology.
Other initiatives taking place within the context of promoting educational opportunities and protecting the right of private organisations, individuals, and communities to support the expansion of educational opportunities)	

Institutions	Programmes/projects
City of Fatick	Creation of a multimedia resource centre at Khar Ndoffène Diouf Middle School, through a partnership with Veolia, and HP. RESAFAD/Senegal trains trainers.
FAWE NGO	Aims to make of the main middle school in Diourbel a place of excellence, thanks to the Internet.
Various initiatives, GIS	• Dyna Entreprises, for example, gives computers to schools to help improve their management. • See also private operations such as GIS (Computerised School Generation), which, after meeting with one school, installed used computers and organised trainings.

Implementing ICT in Education: What Helps and What Hinders

Factors favouring the implementation of a national ICT policy for Senegal are related to the boom in mobile telephony and the multiplication of operators in the telecommunications sector.

In education, Senegal is ahead in the integration and use of ICT in schools. This is indicated by the development of teaching content, follow-up by educational administrators, and intensification in the use of ICT at different teaching levels. However, it is important to note that ICT is not yet widely used as a source of gaining new knowledge. The problem of access to ICT and high-quality content arises. The problems identified are:

- The computer-to-student ratio is still low.
- The lack of power supply and telephone coverage in the countryside is a limiting factor.
- The level of computer proficiency among users and specialists is an issue.
- The computer network is more complex.
- There is a lack of equity in students' access to ICT in schools; only students who can afford fees of up to FCFA5,000 can receive one to two hours of computer classes per week.

Notes

1. The World Factbook 2007. www.cia.gov/cia/publications/factbook/geos/sg.html
2. Observatoire des politques des TIC en Afrique. http://afrique.droits.apc.org/index.shtml?apc=s21834e_1
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ICT in Education in the Seychelles

by Shafika Isaacs
July 2007

Source: *World Fact Book*[1]

Please note:

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Overview

Seychelles is considered as one of the richest countries in Africa by income per capita. The government has made some strides in the promotion of ICTs as a learning subject as part of the national curriculum. According to the UN Economic Commission for Africa, the country has a national ICT policy, although it does not as yet have a specific policy on ICTs in education. A limited number ICT projects have been attempted in the education sector to date.

Introduction

Seychelles comprises 115 islands and islets scattered over the Indian Ocean, 75 of which are uninhabited and volcanic. It has the smallest population of any sovereign state in Africa with 88% being accommodated in Mahé, the largest island. The main economic activities are tourism and marine fishing, along with some agriculture and small-scale manufacturing. Tourism employs 30% of the workforce and provides more than 70% of hard currency earnings. Seychelles is also member of the Southern African Development Community (SADC), the Indian Ocean Commission and the Common Market for Eastern and Southern African States (COMESA).[2]

In 2004 Seychelles was ranked by the United Nations Development Program (UNDP) as a high-income country at 47th out of 177 countries on the Human Development Index. However it is also per capita, the most highly indebted country in the world with a total public debt of 122.8% of Gross Domestic Product (GDP). The debt burden is a function of an over-valued exchange rate that has caused the country to borrow extensively both domestically and from multilateral institutions.[3]

Table 1 provides some selected socio-economic indicators for Seychelles.

Table 1: Socio-economic Indicators: Seychelles

Indicator	
Population	84,494 (2005)
Languages	Official language: English. National language: Creole.
2005 Economic activity (% of GDP)	Agriculture: 2.7% Industry: 28.0% Services: 69.4%
Human Development Index	47 (out of 177 countries)
Per capita Gross National Income (US dollars)	2000: $7,300 (2002); $8,170 (2004) $8,290 (2005)

The Education System

After completing six years of primary school and three years of secondary school, students who wish to continue, needed to attend a National Youth Service (NYS) programme in order to pursue further studies. This two-year programme has historically been the source of much controversy because it was perceived as being of inferior quality and it did not allow learners to live with their parents.. The duration of the NYS programme was later changed to one year, and in 1993 attendance in the programme was no longer a requirement for further education such as at the Seychelles Polytechnic. Because of the absence of higher education institutions in the country, higher education can only be pursued abroad, as there are no opportunities in Seychelles.[4]

Table 2 provides a quantitative perspective of some selected system indicators.[5]

Table 2: Selected Education Data

Indicator	
Enrolment in primary education (% gross)*	110 (2004)
Enrolment in secondary education (% gross)*	102 (2004)
Transition to secondary	95 (2003)
Gender Parity Index (GPI)**	1.00 in primary; 1.08 in secondary (2004)

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**GPI = gross enrolment ratio (GER) of females, divided by the GER of males and indicates the level of access by females to education compared with males. In Seychelles, the GPI suggests that there is gender parity in primary and secondary schools.

Infrastructure

An e-readiness assessment of southern African countries conducted by SADC in 2002 rates Seychelles as having among the most developed infrastructure compared with other southern African countries. Seychelles also rates among the highest in terms of fixed-line density, mobile phone penetration, electricity penetration, PC penetration, Internet access, and number of households with television and radio. However, despite having a good infrastructure, there are reportedly disparities in the use of distribution and use.[6]

Table 3 provides a snapshot of the state of national ICT infrastructure in Seychelles.[7]

Table 3: ICT in Seychelles

Indicator	
Fixed-line subscribers (2004)	70 per 1,000 persons
Mobile subscribers (2004)	49 per 1,000 persons
Dial-up subscribers (2004)	3.3 per 1,000 persons
Internet users (2004)	20 per 1,000 persons

Television broadcast stations (1997)	2
Radio stations (2001)	AM 1; FM 1

The linkage of Seychelles to the South Africa-Far East (SAFE) submarine cable which is a connection of over 13,800 km from Cape Town in South Africa to Malaysia, linking Mauritius, Reunion and India on the way, is still under discussion within the Seychellois government[8].

ICT Policies

According to the UN Economic Commission for Africa, the Seychelles government has a national strategy on ICTs that is co-ordinated and implemented by the Ministry of Information Technology and Communication.[9]

Early in 2007, the Seychelles government was the last of the COMESA countries to receive financial and technical assistance to establish a national consultative ICT committee which comprises representatives of the public and private sectors[10].

With reference to ICTs in education, in 2000 the government adopted Education for a Learning Society, which included the principle of introducing ICTs in schools and which affirms a commitment by the Ministry of Education to provide the widest possible access to information technology and harnessing its full potential for supporting and enhancing the learning process.[11] A national curriculum document also identifies ICT as a key learning area.

In 2005 the president of Seychelles announced that under a new secondary school curriculum that will be implemented as of January 2006, ICT will be introduced as an academic subject with the possibility of an International General Certificate in Secondary Education (IGSCE) in computer studies being introduced in 2007. The director for IT services in the Ministry of Education said that the programme will expose the children to ICTs at a very early age and help bridge the digital divide in the long term.[12]

In May 2007, the Seychelles president announced plans to popularize the use of ICTs in education through a subsidized scheme for teachers to gain access to laptops. Dell laptops will be provided to teachers at 25% of their market value and the proceeds from the sale of these laptops will be used to establish a fund for the continuity of the scheme[13].

Current ICT Initiatives and Projects

Two of the known initiatives under way in Seychelles are: the Microsoft Partners in Learning and the Virtual University for Small States of the Commonwealth (VUSSC) projects..

Microsoft Partners in Learning
In 2005 Microsoft partnered with the Ministry of Education and Youth to train 166 master teacher trainers in its five-day training programme which involves basic ICT skills development and application to support learning and teaching. The agreement between Microsoft and the Ministry of Education also involved donation of software to schools.

VUSSC
The Ministry of Education in Seychelles hosted a meeting of Ministers of Education from small states to discuss establishing an initiative promoted by the Commonwealth of Learning known as the Virtual University for Small States of the Commonwealth (VUSSC) programme. The VUSSC is a network committed to the collaborative development of free content resources for education.[14]

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in Seychelles in terms of enabling or constraining features in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation	A national ICT strategy is in place and reference is made in the education policy to the promotion of ICT as a subject to be taught in schools.	The country does not have a specific policy on ICT for education.
Advocacy leadership	The former Minister of Education championed the promotion of ICTs in education. The President has made pronouncements which support the promotion of ICTs in education	Leadership has been limited to some representatives within government and to a lesser extent from civil society agencies. .
Gender equity		There are no explicit references to the promotion of women and girls or gender equality in any existing policy documents related to ICTs or ICTs in education
Infrastructure and access	Relative to other countries in Africa, Seychelles ICT infrastructure is strong.	

Collaborating mechanisms	A national consultative ICT committee has been established which include representatives from public an private sectors	There are limited known mechanisms for collaboration on ICTs in education in the country that also involves civil society agencies
Human resource capacity		Human resource capacity is limited, particularly in reference to ICTs in education and in view of the absence of higher education institutions in the country
Fiscal resources	A subsidised scheme to provide laptop access to teachers have been introduced in 2007	The country has no fiscal resources dedicated to ICTs in education.
Learning content	The government has introduced ICTs as a learning subject in schools.	

Notes

1 The World Factbook 2007. https://www.cia.gov/cia/publications/factbook/geos/se.html
2 Seychelles country profile. UNESCA.
http://www.uneca.org/aisi/nici/country_profiles/Seychelles/seychab.htm
3 Wikipedia: Seychelles. http://en.wikipedia.org/wiki/Seychelles
4 Seychelles Education. http://www.country-studies.com/seychelles/education.html

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10 Gervais, J Henrie (2007) : "Committee set up to advise government on ICT" in Highway Africa News Agency, 19/01/07. http://hana.ru.ac.za/article.cfm?articleID=1260
11 Paterson, A. "Conditions Necessary for the Successful Implementation of ICT in Seychelle Schools." In *The Use of ICTs in the Curriculum in Botswana, Namibia and Seychelles.* 2004. SADC Education Policy Support Initiatives. HSRC, South Africa.
12 Seychelles plans new way ahead for ICT training.
http://www.digitalopportunity.org/article/view/117884/1/
13 Gervais, J Henrie (2007) :Laptop Computers at a Subsidised Price. In Highway Africa News Agency, 10/05/07. http://hana.ru.ac.za/article.cfm?articleID=1383
14 A Virtual University for Small States of the Commonwealth . COL.
http://www.col.org/colweb/site/cache/bypass/pid/3109?print=1

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ICT in Education in Sierra Leone

by Kofi Mangesi
June 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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It is expected that individual *Country Reports* from the *Survey of ICT and Education in Africa* will be updated in an iterative process over time based on additional research and feedback received through the *info*Dev web site. For more information, and to suggest modifications to individual *Country Reports*, please see www.infodev.org/ict4edu-Africa.

Overview

As a country recovering from a devastating civil war that destroyed its infrastructure, Sierra Leone has huge gaps in both ICT policy-making and implementation both at the national and educational levels. An ICT policy has still not been finalised, and the education sector has no systematic policy of integrating ICTs at all levels. There seems, however, to be a strong governmental will to make ICT a core component of its education reforms.

Country Profile

Sierra Leone shares a border with Liberia and Guinea and is located on the west coast of Africa, facing the Atlantic Ocean. It became a republic in 1971 with Siaka Stevens as president for a five-year term. In 1978 it became a one-party state under Stevens's APC party.

Sierra Leone experienced a long period of civil war; however since the war in the 1990s, the country's economic performance has been robust, especially during 2002-04, due to a recovery in agriculture and mining outputs. The country has sustained a strong economic recovery: 4.3% GDP growth in 2002, 9.3% in 2003, and 7.4% in 2004. Recovery has been propelled by large-scale resettlement and reconstruction, increases in land under cultivation, a resumption of mining, a bounce-back in the private sector, and the growth of donor-financed imports.[2]

Table 1 provides some selected socio-economic indicators for the country.[3,4]

Table 1: Selected Country Data

Indicator	
Population	5.5 million
Languages	English
Adult literacy rate (2005)	35.1 (% people aged 15 and above)
Economic activity 2005 (% of GDP)	46.1: Agriculture 24.4: Industry 29.5: Services
Human Development Index	176 out of 177 countries
Human Poverty Index	95 out of 102 countries
Per capita gross national income (US dollars)	$140 (2000); $210 (2004); $220 (2005)

The Education System[5]

In Sierra Leone's 6-3-3-4 education system, primary education lasts for six years, followed by secondary education which is divided into two 3-year cycles. The first cycle leads to the Basic Education Certificate Examination and the second to the Senior School Certificate Examination, which gives access to higher education, which is offered by one university (comprising institutes) and its constituent colleges, teacher-training colleges, and a technical institute. All of these fall under the jurisdiction of the Ministry of Education, Science and Technology. The university is governed by the court, composed of non-university and university members, and the senate, which is composed of academic members and is responsible for academic matters.

Sierra Leone has recently made education free for all children by removing school fees. As a result, the number of children going to school has tripled.

Table 2 provides a quantitative perspective of some selected system indicators.[6]

Table 2: Selected Education Data

Primary enrolment (% gross)*	145.1 (2003)
Secondary enrolment (% gross)*	13.8 (2003)
Ratio of girls to boys in primary and secondary (%**)	74.3 (2004)

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**Ratio of girls to boys is the percentage of girls to boys enrolled at primary and secondary levels in public and private schools.

ICT Policies

National

A national policy on ICT is almost non-existent at the present time. However the policy-making process began in 2006 and it is expected to be finalised in 2007.

A Telecommunications Act of 2006 has, however, been passed and has set the pace for the establishment of a regulator the National Telecommunications Commission (NaTCom), with responsibility for licensing and spectrum management among other things.

Education

The absence of a national ICT policy has equally affected the ICT in education policy. However, provisions for ICT utilisation are embedded in the National Science and Technology Policy [6], with assertions such as making science and technology education compulsory in the basic education system by integrating it into the curricula of all schools and at all levels. The policy also states that "the rapid development and exploitation of ICTs shall be targeted."

At the same time, the National Education Master Plan 1997–2006 outlines plans for upgrading teachers through the use of distance education. In support of distance education and learning aided by ICTs, the government's reform initiatives include

restructuring and upgrading of the School Broadcasting Unit in support of the 6-3-3-4 system. An upgraded Educational Broadcasting Division has been proposed to replace the School Broadcasting Unit. One of the objectives of the new proposed division is to produce and deliver quality educational radio and television programmes to complement and enrich lessons in formal and non-formal education classes.

Infrastructure

National

In Sierra Leone, despite all the difficulties the country faces (e.g., limited stability, lack of a national ICT strategy), private-sector activities have led to some efforts at developing a robust ICT infrastructure.

Table 3 provides some of the statistics of ICT infrastructure in Sierra Leone.[7]

Table 3: ICT in Sierra Leone

ICT	
Fixed-line operators	1
Total fixed-line telephone subscribers	23,327
Cellular mobile operators	5
Total cellular mobile subscribers (2005)	297,000
Mobile subscribers (per 1,000 people) (2004)	22
Internet users per 100 inhabitants (2004)	2
Personal computers per 1,000 inhabitants (2004)	12

Education

All the major tertiary institutions, such as the university and polytechnics, have computer centres for training students and giving concessionary Internet access to staff and students. The University of Sierra Leone has a computer centre that provides teaching in basic computer skills to all staff and students. The centre also offers Internet and electronic library services.

At the school level, there is very little infrastructure in terms of computers and the Internet. The competing education needs means that very little has yet been done in the area of equipping schools with computers and efforts in this area are mainly through the support of NGOs.

Current ICT Initiatives and Projects

Table 4 summarises the current and recent ICT initiatives in Sierra Leone.

Table 4: Summary of Current and Recent Initiatives and Projects

Project: FM 95.1 Radio Education Unit: Distance education programme for basic schools • Organisation(s): Ministry of Education, Science and Technology • Funding sources: UNESCO • Contact: www.col.org/colweb/webdav/site/myjahiasite
Project: International Education And Resource Network (iEARN) – helping young people, mainly of school-going age, collaborate with other young people from different parts of the world • Organisation(s): iEARN • Funding sources: War Child Canada • Contact: **www.digitalopportunity.org/external/?url=http://www.iearnsierraleone.org**
Project: ODL Resource Centres – alternative methods of widening access to education • Organisation(s): Plan Sierra Leone • Funding sources: COL, UNESCO, UNICEF, Plan Sierra Leone • Contact: **www.col.org/colweb/site/pid/3897**
Project: Knowledge Aid Project – develops the ability of schools to tap the Internet as an educational resource • Organisation(s): British Council • Funding sources: UK/Sierra Leone governments • Contact: **www.britishcouncil.org/sierraleone-learning-education-project-knowledge-aid.htm**
Project: Taking IT Global (TIG) Sierra Leone Network – resource of opportunities and a network of inspirational young people and their projects. • Organisation(s): Youth-based member organisations • Funding sources: Various local and international donors • Contact: http://sierraleone.takingitglobal.org/
Project: Computer Training in Sierra Leone and the Gambia – train-the-trainer programme that includes office applications and Web design • Organisation(s): Develop Africa Inc. • Funding sources: Individual donations • Contact: hwww.universalgiving.org/donate/computer_training_in_sierra_le/id3102.do
Project: Learning for Livelihood Initiatives – non-formal education directorate of MEST • Organisation(s): Government of Sierra Leone • Funding sources: UNFPA • Contact: http://pcf4.dec.uwi.edu/viewpaper.php?id=414&print=1
Project: Sierra Leone and Science and Technology Information Network (SALSTINET) – fosters collaboration between information providers, researchers, "informaticians," and end users of science and technology information (STI) in the country • Organisation(s): University of Sierra Leone • Funding sources: Carnegie Corporation

• Contact: **www.firstmonday.dk/issues/issue5_2/kargbo/index.html**
Project: Access to ICT4SD in Colleges – aimed at introducing computers to university students • Organisation(s): Society for Democratic Initiatives • Funding sources: Stockholm Challenge • Contact: http://old.stockholmchallenge.se/projectdata.asp?id=1&projectid=487

Implementing ICT in Education: What Helps and What Hinders?

Table 5 provides a framework for understanding the core factors that help and hinder the development of ICTs in education in Sierra Leone.

Table 5: Factors Influencing ICT

Factors	Enabling Features	Constraints
Policy framework and implementation plans	A commitment in the Education Master Plan	Lack of a national and educational ICT policy
Advocacy leadership	A strong NGO community promoting ICTs in schools	
Gender equity		Inequality in access to education between boys and girls
Infrastructure and access		Erratic supply of electricity/ High costs of telephone connection and the long-distance charges
Collaborating mechanisms	A strong donor support for ICTs and government commitment to rebuilding education infrastructure	
Human resource capacity	Increase in private initiatives providing ICT training	Inadequate supply of skilled ICT labour in Sierra Leone
Fiscal resources		Lack of adequate government resource for education
Learning content		Lack of any standardised ICT curricula
Attitudes	Strong commitment on the part of teachers and administrators	
Sustainability		Heavy reliance on donor projects

Notes

1. The World Factbook 2007. https://cia.gov/cia//publications/factbook/geos/sl.html
2. Country Brief: Sierra Leone. 2007. World Bank. http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/AFRICAEXT/SIERRALEONEEXTN

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3. Sierra Leone Data Profile. 2006. World Bank. http://devdata.worldbank.org/external/CPProfile.asp?CCODE=SLE&PTYPE=CP
4. "Beyond Scarcity: Power, Poverty, and the Global Water Crisis." *Human Development Report 2006.* 2006. UNDP. http://hdr.undp.org/hdr2006/
5. The Development of Education. National report from Sierra Leone. http://www.ibe.unesco.org/countries/countryDossier/natrep96/sierraleone96.pdf
6. Alghali, A.M., E. Turay, E. Thompson, and J. Kandeh. "Environmental Scan on Education in Sierra Leone." Presentation: Freetown, Sierra Leone, February 16-18, 2005. www.col.org/colweb/webdav/site/myjahiasite/shared/docs/05SierraLeone_EnviroScan.pdf
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ICT in Education in Somalia

by Harry Hare
June 2007

Source: *World Factbook*[1]

Please note:

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Overview

Somalia gained its independence in 1960, and 10 years later the country was plagued by a civil war that lasted for 21 years. By 1991, this war had ceased, but the education system had disintegrated beyond repair. Sporadic fighting among warlords guarding territorial interest continued until 2004 when the transitional federal government (TFG) was installed to normalise the administration and bring back law and order.

The country is still facing political challenges. In June 2006, a loose coalition of clerics, business leaders, and Islamic court militias, known as the Supreme Council of Islamic Courts (SCIC), defeated powerful Mogadishu warlords and took control of the capital. The courts continued to expand, spreading their influence throughout much of southern Somalia and threatening to overthrow the TFG.

The education sector is greatly affected by this political instability which has resulted in the displacement of people, destruction of infrastructure and schools, and looting of equipment and books. As much as things are slowly returning to normal, thanks to the efforts of UN bodies, NGOs, and local communities, education system revival and reforms are just but beginning. And as much as ICT is acknowledged as a possible tool in the reform agenda and a possible catalyst to bring about better quality and more accessible education in Somalia, it does not feature in the current plans of most of the organisation working in Somalia or the ministry in charge.

Country Profile

Somalia covers a land mass of 637,657 square kilometres on the east coast of Africa bordering Ethiopia, Kenya, and Djibouti. Years of fighting between rival warlords and an inability to deal with famine and disease have led to the deaths of up to one million people. Somalis, which comprise a former British protectorate and an Italian colony, was created in 1960 when the two territories merged. Since then, its development has been hindered by deep political divisions.

Agriculture is the most important sector, with livestock normally accounting for about 40% of GDP and about 65% of export earnings, but Saudi Arabia's ban on Somali livestock due to Rift Valley Fever concerns has severely hampered the sector. Nomads and semi-nomads, who are dependent upon livestock for their livelihood, make up a large portion of the population. Forty-four percent of the population is under the age of 15.[1]

Table 1 provides some selected socio-economic indicators for the country.

Table 1: Socio-economic Indicators: Somalia

Indicator	
Population	8.86 million (2006 est.)

Languages	Somali (official), Arabic, Italian, English
Adult literacy rate	19.2% (2002)
GDP (US dollars)	$5.023 billion (2006 est.)
Human Development Index	Not available
Human Poverty Index	Not available

The Education System

Somalia has adopted the 8-4-4 education system with eight years of primary education, four year of secondary, and four years of undergraduate studies. The Ministry of Education is responsible for primary, secondary, technical, vocational, primary and technical teacher training, and non-formal education. The Ministry of Higher Education and Culture oversees secondary teacher-training colleges, the Somali Academy for Science and Arts, the National Museum, and the National Library. The six National Universities are autonomous.[2]

Education and formal classroom learning opportunities are limited and unavailable for a majority of children in Somalia. There have been substantial increases in the number of operational schools and in enrolment rates since the transitional federal government came to power in 2005, but considerable disparities in the quality of and access to primary education are still problematic in parts of the country because of the socio-economic, cultural, and political realities. Primary education is paid for and managed by regional educational committees which assumed the role of the government during the war. Only in Puntland is education free and teachers are paid by the administration.[3]

Most existing schools are concentrated in and around urban areas and are mainly financed by fees or other forms of support from parents and communities, with some input from external agencies. There are various NGOs, both local and international, working in the education sector in Somalia and an education sectoral committee under the Somalia Support Secretariat sitting in Nairobi, Kenya.

Somalia has one of the lowest primary school enrolment rates in the world. A survey of primary schools in 2003-04 showed that there are 1,172 operating schools with a total enrolment of over 285,574 children representing a 19.9% gross enrolment ratio. Gender-related disparities remain an area of major concern. The survey results revealed that only slightly over one-third, or 37%, of pupils are girls at the lower primary school levels. Since the 2003-04 survey, there has been very little progress on reducing the gender disparity, which increases rapidly in higher grades.[4]

Working alongside other UN agencies, NGOs, local development groups, and the regional educational committees, UNICEF has helped develop a new national curriculum and textbooks for primary grades. Somali educationalists joined a two-year process that was fraught with logistical difficulties and political sensitivities. A series of consultative workshops ensured that all stakeholders had a voice in the process, resulting in a “home-grown” curriculum that respects cultural differences while advocating for the rights of all children. The curriculum is now in place in nine out of 10 primary schools.[5]

Table 2 provides a quantitative perspective of some selected system indicators.

Table 2: Selected Education Data[6,10]

Indicator	
Net primary enrolment	62.5% (2005)
Net secondary enrolment	24% (2005)
Gross tertiary enrolment	5% (2005)
Adult literacy	37% (2005)
Gender Parity Index	Not available
Education expenditure as a % of GDP	Not available

ICT Policies

Since the transitional federal government (TFG) came into power, a lot of effort through various international organisations, notably UNICEF and the UNESCO, has been to increase primary school enrolment with the adopted minimum standards of quality primary education and to improve access to post-primary education for Somali children and youth, including technical, vocational and higher.[7,9]

Some of the strategies used by the UN country team in Somalia in collaboration with the TFG include the following:

- A massive enrolment and back-to-school campaign to increase the number of child- and girl-friendly learning spaces to 7,313
- Provision of alternative primary education to 18,000 school-age children
- Extension of school-feeding programme to cover 60,000 children
- Targeting of female enrolment of 40% to 50% at all levels
- Provision of literacy, life skills, and vocational training to 5,000 ex-militia
- In-service training for 1,800 head teachers and mentoring for 4,500 teachers
- Textbook induction for 4,500 upper primary teachers
- Conducting of Grade 8 examinations for 4,095 students and continuing to reach out to Arabic medium schools to unify the curriculum

At the secondary school levels, the policies were geared towards the following:

- Increasing enrolment in secondary schools to 25,000 students, targeting 35% female participation
- Completing 70% of the development of curriculum and assessment systems to international standards
- Increasing enrolment in technical-vocational training to 8,000 trainees, providing 1,540 textbooks in 64 titles to vocational training centres (VTCs), and upgrading managers and instructors of VTCs
- Developing a scholarship programme for 134 Somali university students

- Having HIV/AIDS mainstreamed as part of life skills in teacher training and publications including for children and youth and alternative methods of communicating to youth including through radio programmes

These objectives form the basis of a draft education policy that also aims to increase capacity for staff at the Ministry of Education, reconstruct schools that have been destroyed, and improve the curriculum.

Infrastructure

Despite the lack of a central government and an economy in ruins, and to the surprise of its closest neighbours, Somalia's telecommunication sector boasts cutting-edge technologies and a mushrooming of wireless solutions. For several years, the country was, to all intents and purposes, disconnected from the rest of the world, but it now has the lowest calling rates in the region.

Prior to 1991, the country had only 8,500 operational fixed lines, most of which were in the capital, Mogadishu. In the ensuing political turbulence, that infrastructure was destroyed, along with its Public Switch Transmission Network. This left Somalis without the means to connect to the large expatriate community of friends and relatives.

After the war, infrastructure had to be built from scratch, but the situation has developed quickly off a low base. Table 3 provides a snapshot of the state of ICT infrastructure in the country.

Table 3: ICT in Somalia[1]

Indicator	
Telephone lines	100,000 (2005)
Mobile phone subscribers	500,000 (2005)
Internet users	90,000 (2005)
Television stations	4 (2001)
Internet hosts	3 (2006)
Radio stations	11 FM;1 shortwave (2001)

ICT in schools

The seemingly healthy ICT infrastructure is found mostly in the urban centres, especially the capital city, Mogadishu. This translates to limited use of ICT in the schools, most of which are located outside of Mogadishu. Policy efforts have been focused on reviving the education system, increasing enrolments, and reducing the school drop-out rate and not ICT. There are some private schools that use ICT but more as an administrative tool than as something integrated into teaching and learning. Most of these schools are around the urban centres, especially Mogadishu and in the semi-autonomous province of Puntland.

ICT in tertiary

The UNDP, together with other partners including the World Bank and the African Virtual University (AVU), are supporting the Somalia Somali Institutional and Capacity Development project (SICAD) whose outputs include capacity-building of key government bodies, civil service training, and tertiary institutions through increased use of ICTs.[8]

The Online Distance Learning Initiative which was launched in 2005 enables students to attain internationally accredited university qualifications and build their research capacities through expanded access to global learning and knowledge through partnerships with institutions in other countries.

The six institutions being supported by UNDP under the World Bank Low Income Countries Under Stress (LICUS) Distance Learning and Connectivity Project are East Africa University (Bossaso), Puntland State University (Garowe), the Somali Institute of Management and Administration Development (SIMAD) (Mogadishu), Mogadishu University, University of Hargeisa and Amoud University (Boroma). They are also part of the African Virtual University (AVU) network giving them access to digital resources and on-line short courses. Long courses in journalism and teacher education are underway.[11]

Current ICT Initiatives and Projects

All efforts by the government and the donor community have been placed on getting the school system to work and encouraging parents to send their children to school. Efforts have also been put in disarming young militia and re-integrating them into the education system either through the school system or vocational training centres. UNICEF and UNESCO have taken up the challenge of reconstruction in Somalia and are promoting several projects, but none of these have any ICT components.

In 2006, UNDP in partnership with the World Bank provided resources for inclusion of the six Somalia universities into the African Development Fund/NEPAD Teacher Education Project through the African Virtual University network. This effort was aimed at developing teacher and training capacity for Somalia faster and at the same quality with the rest of the region.

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in Somalia in terms of enabling or constraining features in the education system.

Table 6: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Political instability		Somalia continues to face serious political problems that have disrupted the education system. This instability does

		not provide an enabling platform for using ICT in education.
Policy framework		Due to the instability in the country, efforts are only beginning to bring children back to class. The focus of the country is, therefore, more on enrolment and vocational training. As much as it is acknowledged that ICT can play a role, no effort is in place to introduce ICT in the teaching and leaning environment.
Infrastructure and cost of bandwidth		The war destroyed most of the basic telecommunications infrastructure. New wireless networks are coming into place and providing the much-needed connectivity, albeit in the commercially viable places. Most of these wireless technologies are based on costly satellite networks.
Electricity		As much as the situation is slowly improving, there are vast areas and communities still without electricity. Only the urban areas and the far more stable Puntland have a consistent supply of electricity, leaving the other areas inaccessible for ICT.
Culture and lifestyle		One of the biggest challenges for education experts in Somalia is the nomadic nature of communities. It has been difficult to retain children in school due to this lifestyle and by extension a challenge to introduce ICT in education.
Gender equity	War, poverty, and community disparity are among the factors that have worked against education for girls. UNICEF and other UN organisations, NGOs, and local communities are making deliberate efforts to encourage enrolment for girls and even teacher-training for women.	
New technologies	Wireless technologies have started to come into Somalia. With these technologies, there are possibilities that deployment into the education	

	sector can come fast if the policies are put in place.	

Notes

1 The World Factbook 2007. https://www.cia.gov/library/publications/the-world-factbook/geos/so.html
2 World Education Services. Profile, Somalia. 2004. http://www.wes.org/ca/wedb/somalia/soedov.htm
3 "Puntland (Somalia) to Introduce Free Primary Schools." Afrolnews.
http://www.afrol.com/articles/16083
4 Somalia Education. UNICEF. http://www.unicef.org/somalia/education_56.html
5 Communities unite around education in Somalia. UNICEF.
http://www.unicef.org/infobycountry/somalia_25906.html
6 UNESCO Institute of Statistics. Education in Somalia.
http://www.uis.unesco.org/profiles/EN/EDU/countryProfile_en.aspx?code=7060
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8 UNDP. Somalia, Programmes, Institutional and Capacity Development.
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9 UN Development Group. Somalia Team, Work Plan.
http://unctlists.undp.org/index.cfm?module=AnnualReport&page=Workplan&CountryID=SOM&Year=2005&LanguageID=en
10 Somalia, Basic Education Indicators. http://education.nairobi-unesco.org/PDFs/somalia.pdf
11 "Capacity Building: Somali Tertiary Institutions Launch Online Distance Learning Initiative."
http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/AFRICAEXT/SOMALIAEXTN/0,,contentMDK:20753705~menuPK:2009582~pagePK:141137~piPK:141127~theSitePK:367665,00.html

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ICT in Education in South Africa

by Shafika Isaacs
June 2007

Source: *World Fact Book*[1]

Please note:
This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

The findings, interpretations and conclusions expressed herein are entirely those of the author(s) and do not necessarily reflect the view of *info*Dev, the Donors of *info*Dev, the World Bank and its affiliated organizations, the Board of Executive Directors of the World Bank or the governments they represent. The World Bank cannot guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply on the part of the World Bank any judgment of the legal status of any territory or the endorsement or acceptance of such boundaries.

It is expected that individual *Country Reports* from the *Survey of ICT and Education in Africa* will be updated in an iterative process over time based on additional research and feedback received through the *info*Dev web site. For more information, and to suggest modifications to individual *Country Reports*, please see www.infodev.org/ict4edu-Africa.

Overview

In all the different facets of the ICTs for education prism, South Africa boasts more than a decade of accumulated experience from its wide range of projects and programmes pioneered by noteworthy champions across the stakeholder spectrum of communities, the private sector, civil society, donor, development, and government agencies. A variety of tested models on ICT access, digital content development, teacher training and professional development, optimal usage, partnerships, and resource mobilisation have encouraged significant learning among innovators, practitioners, and policymakers. The scale of all these interventions to date has led to at least 22% computer penetration in all public schools. As well, all tertiary institutions have some form of ICT access, ICT research and/or ICT teaching programmes, although limited strides have been made in the informal, ABET, and TVET sectors. While South Africa has a policy on e-education only for the schools and Further Education and Training (FET) college sectors, herein too lay animated debate on the optimal ways to implement the policy.

Over the coming period, with South Africa acting as host for the 2010 World Cup and the national government embarking on accelerated economic growth strategies, the race is on to move to broadband and promote ubiquitous ICT access. South African education institutions in general, and the schools and FET college sectors in particular, are set to grow significantly in ICT access, teacher training, and professional development and usage. However, major challenges still need to be overcome, such as the lack of a comprehensive policy on ICTs in education that covers all sectors in education, the continued need for leadership and co-ordination of various initiatives, the promotion of enhanced learning through optimal usage of the technologies, and, above all, the need to demonstrate the value of the investment in ICTs through improved performance of learners and teachers and improved employability in the changing labour market.

Country Profile

Since 1994 the South African education landscape has undergone major transformation in governance, management, curricular reform, and teacher professional development. Central to this transformation has been a complete policy overhaul in the form of a new national qualifications framework (NQF) and a new curriculum framework for schools based on the concept of outcomes-based education (OBE). The NQF is a key mechanism for creating an egalitarian education and training system in South Africa with redress, access, mobility, and progression as key objectives.[2] OBE, on the other hand, is a learner-centred approach which considers learning as an interactive process between educators and learners, where the educator serves as both teacher and facilitator. This new system, introduced in 1996 as Curriculum 2005, was considered one of the most ambitious and far-reaching reform programmes in southern Africa because it signalled a fundamental shift from South Africa's apartheid past by promoting the principles of equity, democracy, human rights, and economic prosperity. While very noble in its intentions, the implementation of OBE remains fraught with challenges, which the national Department of Education is committed to address.[3]

Table 1 provides some selected socio-economic indicators for the country.

Table 1: Basic Economic Indicators: South Africa

Indicator	
Population	46.9 million (2005)[4]
Languages	11 official languages: English, Afrikaans, isiNdebele, isiZulu, isiXhosa, Setswana, Sesotho, siSwati, Tshivenda, Xitsonga, and Sesotho sa Leboa
2005 Economic activity (% of GDP)	Agriculture: 27.4 Industry: 17.8 Services: 54.9
Human Development Index	121 (out of 177 countries)[5]
Per capita gross national income (US dollars)	$430 (2003); $480 (2004); $530: (2005)

The Education System

South Africa's National Qualifications Framework (NQF) recognizes three broad bands of education:

- General education and training (GET), which runs from Grades 0 to 9 and includes adult basic education and training
- Further education and training (FET), which takes place from Grades 10 to 12, and also includes career-oriented education and training offered in other FET institutions such as technical colleges, community colleges, and private colleges.
- Higher education and training (HET), which includes education for undergraduate and post-graduate degrees, certificates, and diplomas, up to the level of the doctoral degree.

Since 1994, South Africa established a single national system of education which is managed by the National Department of Education (NDOE) with the support of nine Provincial Departments of Education (PDOE). The NDOE assumes national responsibility for higher education, while administrative responsibility for the schools sector lies with the PDOEs based on the national framework for school policy. A Council of Education Ministers, consisting of the Minister of Education, the Deputy Minister of Education, and the nine provincial members of the Executive Council for Education, meets regularly to discuss national education policy, and co-ordinate action. In addition a Heads of Education Departments Committee (Hedcom) consists of the Director-General, Deputy Directors-General of the NDOE, and the heads of PDOEs. The functions of Hedcom include facilitating the development of the national education system, sharing information and views on national education, co-ordinating administrative action on matters of mutual interest, and advising the NDOE on a range of matters.[6]

Education Statistics
South Africa has 12.3 million learners, an estimated 386,600 teachers and 26,292 schools, including 1,098 registered independent or private schools. Of all schools, roughly 6,000 are high schools (Grade 7 to 12) and the rest primary (Grades 0 to 6). There are more than a million students enrolled in the country's 24 state-funded tertiary institutions: 11 universities, five universities of technology, and six comprehensive institutions. These have recently been integrated, with the country's former 36 universities and "technikons" being amalgamated into larger tertiary institutions. Higher education is also offered at hundreds of private institutions, which are registered with the NDOE to confer specific degrees and diplomas.[7]

South Africa's gross enrollment ratio (GER) in 2004 stood at 98%. The gender parity index (GER of females divided by the GER for males), used to indicate the level of access by females to education compared to males, was 1.01 in 2004, suggesting that there is gender parity in the country.

Spending and Challenges
Education was allocated the largest share of the national budget in 2007/08 to the tune of R105.5 billion (estimated USD$15 billion). Much of this budget is allocated to teacher salaries, teacher support staff and assistants as well as bursaries to encourage young people to train as teachers.[8]

South Africa's education system still faces severe challenges in combating the legacy of apartheid:

- Illiteracy rates remain as high as 24% of adults over 15 years of age.
- There remains a shortage of qualified teachers; one-third of teachers teaching mathematics and science were not qualified. Of 50 countries studied in the Trends in International Mathematics and Science Study (TIMMS), 2003, South African Grade 8s featured at the bottom of the scale in mathematics and science. However, Grade 12 pass rates and performance in math and science are showing slow signs of improvement.
- The majority of schools remain under-resourced, under-supplied, and over-crowded.

In contrast to these bleak statistics, South Africa also boasts some independent schools that rank among the best in the world.[9]

Infrastructure

According to the World Economic Forum (WEF) *Global Information Technology Report*, South Africa has the most modern and best developed telephone system in Africa and a vibrant ICT sector with an annual investment of USD$9.6 billion. The *Report* uses the Networked Readiness Index (NRI), covering a total of 115 economies in 2005-2006, to measure the degree of preparation of a nation or community to participate in and benefit from ICT developments.[10] The WEF ranks South Africa 37th out of the 115 economies.

Yet, most of South Africa's infrastructure is also poorly linked and spread unevenly throughout the country.[11]

Table 2 provides a brief snapshot of South Africa's ICT infrastructure.[12,13,14]

Table 2: ICT Infrastructure Indicators, 2005

Indicator	
Fixed-line subscribers	4.7 million
Mobile subscribers	23.1 million
Dial-up subscribers	1.08 million
Broadband subscribers	165,290
Internet users	3.6 million
Television broadcast stations	556
Radio stations	AM 14; FM 347

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Various provincial governments and municipalities in South Africa have invested significantly in infrastructure development and will continue to do so over the next few years in the build-up to 2010 when South Africa hosts the World Cup soccer event. For example, the Gauteng provincial government is currently involved in a R50 billion (USD$7 billion) plan for infrastructure development in Gauteng. The plans include roads and rail development as well as local government service delivery improvement. They will target underdeveloped zones with second-economy characteristics for expansion and provision of ICT infrastructure.[15] These plans, together with the implementation of South Africa's national policy on e-education, suggest that the schools and education institutions are set to improve ICT access and usage.

ICT Policies

The current ICT in education policy framework has been evolving since 1996 and is embedded within a broader national government economic, social, and development strategy which includes:

- Attention at the highest level in government to the role of ICTs in the promotion of economic growth, job creation, social development, and global competitiveness
- Linkages of South Africa's strategy to a broader pan-African mandate as expressed in the commitment to the New Partnership for Africa's Development (NEPAD) programme and its dedicated project promoting e-schooling
- Overhaul in the education and skills development system at all levels

- A dedicated policy on the transformation of learning and teaching through the use of ICTs, particularly in the formal schools and FET college sectors

National Government Strategy

The role of ICTs in the South African government strategy for national economic growth, social development, and job creation has received increasing prominence over time. In 1996, Mr Thabo Mbeki, then the deputy president of the country, played a prominent role in the historic Information Society and Development (ISAD) conference which gave rise to the African Information Society Initiative (AISI) spearheaded later by the United Nations Economic Commission for Africa (UNECA). Since then, a host of programs and strategies have been introduced that demonstrate central government commitment to the promotion of South Africa as an 'information society'. These include the following:

PNC on ISAD

In 2001, as President Mbeki established the Presidential National Commission on the Information Society and Development (PNC on ISAD) which consists of representatives from the public and private sectors. This commission advises government on the optimal use of ICTs to address South Africa's development challenges and enhance the country's global economic competitiveness.

For more information: www.pnc.gov.za

PIAC on ISAD

A Presidential International Advisory Council on Information Society and Development (PIAC on ISAD) was established to advise government on addressing the digital divide with education as a key focus area. This council consists of CEOs of major international corporations and experts active in the ICT sector.

NEPAD

The South African government has been prominent in its support as host country to the Secretariat of the New Partnership for Africa's Development (NEPAD) programme of the African Union, particularly its e-Schools programme and as home to its first pan-African Parliament.

For more information: www.nepad.org

ASGISA

In 2005, the government launched its Accelerated and Shared Growth Initiative for South Africa (ASGISA), which represents a concerted national effort to accelerate skills development and economic growth. Two priority components of ASGISA are electronic communications as a cornerstone to commercial and social infrastructure development and education and skills development. The former includes, among other things:

- Implementation of a strategy to rapidly grow South Africa's broadband network
- Implementation of a plan to reduce telephony costs more rapidly

- Completion of a submarine cable project that will provide competitive and reliable international access, especially to Africa and Asia

For more information: www.info.gov.za/asgisa

SITA

In 1999, the South African government established the State Information Technology Agency (SITA), which serves as a public sector ICT company focused on the effective and efficient provision of ICT services with government at national, provincial, and local levels. Its range of services includes the setting of technology standards for the use of refurbished PCs in public education institutions.

For more information: www.sita.co.za

In February 2007, a National Information Society and Development (ISAD) Plan as a framework for building an inclusive Information Society in South Africa was adopted by the Cabinet. Within this Plan, the vision for the country is expressed as follows:

"To establish South Africa as an advanced Information Society in which ICT tools and information are key drivers"

The Cabinet also approved the establishment of a Ministerial ISAD Committee and its corresponding Forum of South African Directors-General (FOSAD) ISAD Cluster. The ISAD IGRF and the Ministerial ISAD Committee were approved as the national Institutional Mechanisms for building an inclusive Information Society in South Africa[16].

Sectoral Strategies

At a sectoral level, two specific policies stand out in support of ICTs in education, particularly in the schools sector. These include the e-rate policy and its related establishment of an Educational Network (EduNet) and the e-Education White Paper. .

Education Network and E-rate

The Department of Communications (DOC) leads all ICT initiatives in South Africa through its Electronic Communications and Transactions Act (ECA) of 2002, which is an extension of its Telecommunications Act of 1996 and 2001 and which promotes the establishment of a Universal Service Agency (now referred to as the Universal Service and Access Agency of Southern Africa (USAASA),[17] a Universal Service Fund, an Education Network (EduNet), and an "e-rate," all of which serve at least conceptually to support access to and use of ICTs in education institutions.

The Education Network is to be an entity that would network all public schools and education and training institutions.[18]

The e-rate allows discounted access to Internet services to education institutions in South Africa. Section 73 of the ECA states that Internet services provided to all public schools

and all public further education and training institutions must be provided at a minimum discounted rate of 50% of the total charge levied by the licensee. The discount includes, but is not limited to, any connectively charges for access to the Internet, charges for any equipment used for or in association with connectivity to the Internet, and all calls made to an ISP.[19]

E-education White Paper

Policy development on ICTs in education date back to 1995, with the establishment of the Technology Enhanced Learning Initiatives (TELI). which was followed by the Feasibility Study for the Establishment of a Dedicated Educational Channel. In 2001, the National Department of Education and the Department of Communication jointly released a Strategy for Information and Communication Technology in Education, which is believed to have laid the basis for the e-Education White Paper adopted in 2004.[20]

The goal of the policy is that every learner in the primary and secondary school sectors should be ICT capable by 2013. To achieve this, schools are expected to be developed into e-schools consisting of a community of both teachers and learners. E-schools are further defined as having:

- 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
- Connections to ICT infrastructure

In such institutions, the teachers and learners will be able to function across three dimensions:

- Operational – referring to skills to use ICTs
- Cultural – developing cultures that support the practices of using ICTs
- Critical – ability by teachers and learners to challenge assumptions embedded in the success stories about ICT.

E-education is defined as much more than just developing computer literacy skills and the skills necessary to operate various types of ICTs. It is also the ability to:

- Apply ICTs, access, analyse, evaluate, integrate, present, and communicate information
- Create knowledge and information by adapting, applying, designing, inventing, and authoring information
- Function in a knowledge society by using appropriate technology and mastering communication and collaboration skills

This policy is confined mainly to the schools and FET college sectors and does not consider the higher education sector or the Adult Basic Education and Training (ABET)

programmes; community/NGO-led skills development initiatives; research and development institutes; small, medium, and micro enterprise (SMME) staff development; and internship programmes.[21]

Policy Implementation

Implementation of the e-Education White Paper rests with the PDOEs. Some provinces (Western Cape, Gauteng, and Northern Cape), have introduced province-wide programmes on ICT integration in their schools before the formal adoption of the e-Education White Paper and are currently well underway with implementing the goals of the policy. The remaining provinces have begun the process of implementation very recently.

A draft ICT for Education Implementation Plan[22] reports that of the 25,582 public schools in South Africa, 5,778 have computers used for teaching and learning and 13,011 have one or more computer for administrative purposes.

Less than 5% of schools can afford Internet connections and are integrating Internet for teaching, learning, communication, and collaboration. The report states further that in the absence of broadband connectivity, the quality of the use of ICT for teaching and learning is low.

Table 3 provides a detailed breakdown of computer access and use per province.[23]

Table 3: Computer Prenetration in South African Schools, 2005

Province	Total Number of Schools	% Schools with Computers*	% Schools with Computers for Teaching and Learning*
Eastern Cape	6,239	23.0	7.8
Free State	1,842	77.3	25.9
Gauteng	1,897	94.5	78.8
Kwazulu Natal	5,653	43.6	12.0
Mpumulanga	1,863	52.9	16.3
Northern Cape	422	91.0	60.4
Limpopo	4,187	41.8	8.7
North West	2,025	67.6	29.7
Western Cape	1,454	97.0	76.6
National	25,582	50.9	22.6

*Percentage figures have been rounded to the nearest decimal point.

Most schools still struggle to access the 50% discount on Internet services five years after it was first proposed. Schools still don't get ADSL services at discounted rates, and the telcom division that sells wholesale bandwidth has not yet come to an agreement with ISPs to discount upstream bandwidth to them so that they in turn can give discount to

schools.[24] This is corroborated by a draft NDOE report that confirms that the implementation of the e-rate has not been fully implemented due to various interpretations of the Act. The NDOE has initiated a pilot study with the recently established Meraka Institute to develop models for the Educational Network.

More recently, the NDOE announced a tender for transactional advisors[25] to its ICT for Education strategy. The tender document provides a broad overview of a national strategy for the implementation of the e-education policy with targets related to:

- Infrastructure (targeting all schools and support personnel)
- Network connectivity (targeting broadband access to all schools, FET colleges, and district offices in a closed network linked to the Internet)
- Professional development of all teachers, principals, and support personnel
- Curriculum integration
- Research and human resource systems to support the integration of ICT in teaching and learning

Different models of implementation including public private-partnerships, provincial developmental models, and collaboration models are proposed. This suggests that the next few years will potentially witness a significant increase in the rollout of ICTs to schools in the form of public-private partnerships. KPMG has been granted the role as transactional advisor and they are currently engaged in a study involving a wide range of stakeholders, to ascertain the feasibility to roll out a national program for all public schools and FET colleges.

Current ICT Initiatives and Projects: Schools

South Africa has a host of dispersed and unco-ordinated programmes and projects that promote education through the use of ICTs at various levels of the education system, particularly in the formal schools sector. A study by SchoolNet South Africa (2002) lists 34 different programmes and projects in the schools sector. Since then a few have fallen by the wayside and some have tended to collaborate more closely. The need for co-ordination remains.

Some of the individual government departments of education have had their own provincial strategies, particularly in the schools sector. In view of the new implementation strategy underway, the NDOE is set to play a stronger supportive role to PDOEs.

The major programmes in the schools sector currently underway in South Africa are listed below while Appendix A provides names of additional projects in operation.

Technology Access Programmes

The predominant large-scale technology access model has been the computer lab

containing between 10 and 20 PCs, networked and sometimes connected to the Internet. Organisations such as OLSET work with an interactive radio model, and Mindset and the Learning Channel utilise a television broadcast platform. Mindset also makes use of print, computer-based multimedia and satellite data-cast platforms as complementary to the computer labs. The NEPAD e-Schools Demonstration Project also used the computer lab model in conjunction with the establishment of a media lab which includes a television and a "health point" – a computerised kiosk providing health content. Whilst useful, the computer lab model has also proven to be spatially and time-bound. Alternative solutions using mobile devices such as laptops for teachers, piloted by Intel and cellular phones piloted by the Meraka Institute and Mindset. These have not as yet reached rollout on a significant scale..

E-Schools' Network

Formerly known as the Western Cape Schools Network, the e-Schools' Network was founded in 1993 by a group of teachers who understood the importance of e-mail in education. The original 10 schools supplied with services has now grown to 1,700 schools countrywide

E-Schools' Network is a non-profit, self-funded organisation that provides the school and FET college community in South Africa the following:

- Connectivity and communication solutions, which are negotiated annually with Internet service providers to bring best-priced quality services to schools
- Call centre support tailored to the unique needs of the school and FET college environment, probably the only call centre that makes more outgoing calls than incoming
- Consultancy and training support service in educational technology, with a particular focus on providing and sustaining connectivity and on-line communication services in schools
- Project development and management on behalf of a wide range of clients, especially where e-Schools' Network is able to grow ICTs in educational communities that are in need.

Its e-mail service, SchoolMail, which works on any operating platform, creates a mailbox for each learner and educator in a school for less than R1000 (about $143 USD) per annum. They also run an educational conference that creates a platform for educators to showcase their unique approach to curriculum-integrated ICTs and to share these insights with their fellow educators. The organisation serves as country co-ordinator for a programme involving volunteers from the Belfast Unemployment Resource Centre (Northern Ireland) to spend time in schools by fixing computers and installing software over a four-week period. Any profits made are channelled back into projects at schools to grow the number of schools who have access to ICTS in education.

E-Schools' Network has been one of the few institutions that has lobbied in support of

the implementation of government's e-rate policy.

For more information: www.esn.org.za

Gauteng Online

Gauteng Online is the leading technology access programme in schools in the Gauteng province. It is a programme of the Gauteng provincial government through its Department of Education. The programme's access model involves establishing a computer laboratory with 25 work stations, Internet and e-mail access, to be used for curriculum delivery in all Gauteng schools. The main goals of the programme are to:

- Contribute towards building the human resources capacity of the province and the country through the provision of quality education
- Contribute towards stimulating positive economic activity in the country through the creation of a strong local ICT industry that has a capacity for ICT development and innovation
- Enhance the efficacy of government for improved service delivery and a better life for all
- Position the province at the cutting edge of change through technological innovation
- Bridge the digital divide

In developing these outcomes into a coherent programme, the Gauteng Department of Education worked in partnership with companies like Accenture, KPMG, and Ernst and Young with whom it invited major companies in the South African ICT industry to participate in a pilot project to design the most suitable educational solution for Gauteng schools. Seven consortia were assembled in 2002-2003 to design, build, and run end-to-end solutions for a range of Gauteng schools. Some of these were successful in a later tender process while others were not. To date Gauteng Online has reached an estimated 1,200 schools with PC labs.

For more information: www.gautengonline.com

Khanya Project

The Khanya Project, established in 2001, is one of the first dedicated provincial government programmes in South Africa to address the shortage of educator capacity and the need to deliver curriculum to schools through the innovative use of ICTs. Its ambitious goal is to have every educator in every school of the Western Cape empowered to use appropriate and available technology to deliver curriculum to each and every learner by 2012.

The Khanya Project is modelled as a programme of projects, which considers the diversity of the schools in the province and their varying contexts and resource bases. The programme considers two development phases. The first involves establishing a dedicated space, room, or lab where the technologies will be installed together with the educational software, Internet connectivity, and security. The second phase focuses on

the educational use of the technologies and includes training of educators in the use of ICTs.

To date, the Khanya Project has delivered PCs and provided network infrastructure and training to 613 schools, while another 241 schools are in various stages of implementation (from the basic identification as a Khanya project school, to the final stage of training network administrators). They have provided almost 24,000 computers to these schools (just over half have been funded by Khanya or its donor partners and the rest have been procured by the schools themselves), about 16,000 educators are being trained. Over 500,000 learners are already reaping the benefits of the project.[26] In 2007, the project will also focus on rolling out to primary schools in the province with an initial target of reaching 200 schools.

Core funding for the project is provided by the provincial government of the Western Cape. Between 2001 and 2006, a total of R104 million (USD$14.8 million) has been committed. In addition, donor organisations and corporate sponsors have contributed approximately R20 million (USD$2.8million).

Local communities contribute to the establishment of technology facilities in schools on the premise that education is a shared responsibility by the state, local community, and parents. At present approximately 20% of all costs are carried by the community. In turn, the facilities are made available to communities to enhance adult learning and, in particular, computer literacy.

The Khanya Project has won a number of awards for its successful achievements.

For more information: www.khanya.co.za

Meraka Institute

The Meraka Institute, recently established as part of the Centre for Scientific and Industrial Research (CSIR), focuses on three key areas:

- Human capital development in ICT forming a critical thread throughout the Institute's activities and ensuring continued development, growth, and sustainability
- Innovation in ICT leading to applications that address development challenges facing South Africa, the continent, and the developing world, thereby directly contributing to addressing the challenges faced by the second econom.
- Advanced technical research enabling indigenous ICT leadership through a critical mass of high-quality research and development

The Meraka Institute has an emerging ICT in Education Research Group that directly supports the South African national Department of Education's e-Education White Paper and has two major research and innovation areas: the formal application of innovative ICTs to support teaching and learning in schools and a more informal approach of creating hands-on exposure for children aged three to 18 to science and technology

careers. Examples of specific research topics within the group include:

- Application of mobile technologies in collaborative formal and informal learning environments
- Application of gaming and blended media environments to support formal and informal learning activities
- Design of innovative, graphical learning environments for children
- Assessment and evaluation techniques for measuring learning outcomes resulting from ICT interventions in the educational domain
- Use of multimodal technologies in child-computer interaction environments
- Design and development of physical/tangible learning objects ("intelligent e-toys")
- Use of alternative learning devices and technologies to support education in a developing world context

For more information: www.meraka.org.za

Microsoft Schools Agreement and ASTIC

In 2002, the Minister of Education, and Microsoft South Africa signed an agreement to provide all government schools perpetual free access to the use of selected Microsoft software. The agreement was estimated to save the government up to R100 million per year. The offer covers all PCs located within the school as well as home PCs belonging to full-time teachers. Schools will be licensed on an annual basis. The only requirement is that they ensure that the software is used solely for educational and teaching purposes and that it is not sold or illegally copied.[27]

Microsoft's Partners in Learning programme also recently established an African Schools Technology Innovation Centre (ASTIC) in Troyeville, Johannesburg, which serves as a centre for the provision of information, training, and equipment for teachers in order to encourage their innovative use in teaching and learning. The ASTIC also serves as a virtual gateway by showcasing innovative technology, processes, and educational pedagogy available and by providing access to a network of experts worldwide.[28]

For more information: www.microsoft.com/south_africa

NEPAD eSchools Initiative

The New Partnership for Africa's Development (NEPAD) eSchools Initiative is a multi-country, multi-stakeholder, continental initiative that aims to impart ICT skills to young Africans in primary and secondary schools and improve the provision of education in schools through ICT applications and the use of the Internet. The first phase of the initiative is a Demonstration (Demo) project that is being implemented by the private sector partners. [29] The objectives of the Demo project are to:

- Determine typical e-school scenarios and requirements in various circumstances in Africa
- Highlight the challenges inherent in a large-scale implementation of e-schools programmes

- Monitor the effectiveness of multi-country, multi-stakeholder partnerships
- Determine "best practice" and exemplary working models for the large-scale implementation of the initiative, which aims to equip more than 550,000 African schools with ICTs and connect them to the Internet
- Demonstrate the costs, benefits, appropriateness, and challenges of a satellite-based network
- Demonstrate the costs, benefits, and challenges of ICT use in African schools

The Demo Project has been implemented in 6 secondary schools in each of 16 countries across Africa through partnerships that involve private sector consortia. South Africa is one of the 16 countries where the Demo Project was co-ordinated by a dedicated country liaison person based at the National Department of Education. Cisco, Hewlett Packard, and Oracle are three companies who formed consortia to support the Demo Project in six South African high schools where the typical model involved fitting each school with a lab comprising approximately 20 PCs, a server and a printer, and a media lab. Teachers at the six schools received training and learners have subsequently used the PC labs in the classroom.

For more information: www.nepad.org

Shuttleworth Foundation
Established in 2001 by entrepreneur Mark Shuttleworth, the Shuttleworth Foundation promotes and supports programmes in education, technology, and open content in South Africa. One of its major achievements is the production of the Freedom Toaster, which is a self-contained, computer-based, kiosk preloaded with free digital products including software, photography, music, and literature. The Freedom Toaster project began as a means of overcoming the difficulty in obtaining Linux and Open Source software due to the restrictive telecommunications environment in South Africa, where the easy downloading of software is not possible.

For more information: www.shuttleworthfoundation.org

TuxLabs
TuxLabs was initially an in-house initiative of the Shuttleworth Foundation and is now a proprietary company that promotes the establishment of computer labs networked on a thin-client solution based on the use of open source software. There are reportedly 208 schools fitted with the Tuxlab model in South Africa.

For more information: www.tuxlab.org.za

Teacher Professional Development and Training
The National Department of Education has developed a new framework for the professional development of South African teachers as well as guidelines to enable teachers to use ICTs. Presently, a few significant programmes on teacher training, professional development and ICT integration, stand out in South Africa. SchoolNet South Africa (SNSA), one of the most established and reputable non-government

organisations (NGOs) on ICTs in education in South Africa, has evolved over the past 10 years as the leading agency in the delivery of its own programme, the Educators Development Network (EDN), and as the national agency in the delivery of two multinational teacher development programmes, Microsoft Partners in Learning and Intel Teach to the Future. There are also university-based programmes such as the Tshwane University of Technology's specialisation on computer applications technology and information technology, and the University of Kwazulu Natal's Advanced Certificate of Education (ICT Integration) for teachers with the University of Johannesburg using Intel Teach as part of its B.Ed. Course, and the University of Pretoria using Intel Teach in its PGCE course. The University of Fort Hare and Central University of Technology in the Free State use Intel Teach as Staff Development, and the latter is about to use the Intel Teach programme as part of a yet-to-be-determined qualification.

SchoolNet South Africa's Educator Development Network (EDN)[30]

EDN is an innovative ICT development programme that guides online communities of teachers to learn with and from each other. It is an online learning model that includes introductory training, materials comprising 20 different modules, virtual communities of up to 20 teachers, mentor support for groups and individuals, tracking and archiving through an established database, a Web portal of resources for teachers and recognition of teacher progress by means of a certificate for those teachers who complete six introductory modules and credits towards an Advanced Certificate of Education offered by the University of Kwazulu Natal.

A French version of the EDN model has also been developed in partnership between SchoolNet South Africa and SchoolNet Africa including the training of dedicated teacher mentors located in francophone West Africa.

SNSA has trained approximately 7,000 teachers through its EDN programme, over 20,000 teachers through 1,000 facilitators at 1,000 different schools on the Intel Teach programme, and 7,882 teachers on the Microsoft Partners in Learning programme.

Microsoft Partners in Learning (PiL)[31]

Microsoft PiL is a global initiative that was launched in September 2003 to target countries and educational institutions that fall into the poorest categories of the World Bank's income index. Microsoft established partnerships with local institutions on the implementation of a global ICT in education programme tailored to local contexts, from capacity-building to direct teacher training. In South Africa, the PiL programme partnered with SchoolNet South Africa in the localisation of face-to-face teacher-training materials and delivering the training in schools. These training programmes include basic ICT skills for teachers, ICT integration, ICT leadership for education managers, 21st century school leadership, peer coaching, and a student helpdesk. To date, the programme has reached more than 8,600 teachers and Department of Education officials.

Intel Teach[32]

Intel Teach is a worldwide effort to help both experienced and pre-service teachers

integrate ICT into teaching and learning to develop learners' higher-level thinking skills and enhance learning. As part of the global Intel Innovation in Education initiative, a multi-million dollar effort to help realise the possibilities of science and technology in education, this programme is designed to prepare today's educators and learners for tomorrow's demands. Participating educators receive extensive training and resources to plan projects that promote effective use of computers and the Internet in the classroom. Intel Teach is one of the official professional development programmes of SACE (South African Council for Educators).

Digital Education Content

There are a limited number of local programmes and organisations committed to the development of digital content for use in schools. The models for digital content development often come from imported curriculum content of a proprietary nature that would be localised and adapted for a South African context. LearnThings and Intel's Skool.com programmes are examples. On the other hand there are digital curriculum programmes that are locally produced and directly aligned to South Africa's National Curriculum Framework. These would include Mindset and the Learning Channel. A few programs have also opted for Creative Commons licensing and the promotion of open education resources.

Mindset Network

Mindset specialises in the creation of open digital education content licensed under the Creative Commons in the health, livelihood, and education sectors. Its main focus is to source and create electronic content focused on national policies and curriculum frameworks and promote the pedagogical use of its content in primary and high schools, technical and vocational institutions, and clinics and hospitals throughout South Africa and Africa. Content is developed in multiple formats (video, print, computer based multimedia) and is distributed via multiple platforms (satellite datacast, DVDs, broadcast via two television channels, Web, and soon mobile devices). Mindset also includes the promotion of technology access, teacher training and development, training of health care practitioners, research, monitoring and evaluation as a comprehensive solution to schools, hospitals, and clinics.

Mindset's track record includes the development of more than 200 hours of school education and 80 hours of health video content with more than 600 hours of content available in its archives. Mindset has also successfully rolled out to 1,500 schools and 300 health clinics and hospitals across South Africa. Its programme for secondary schools is referred to as Mindset LEARN and its primary school programme is called Mindset CABANGA. Mindset also has a pan-African mandate and is currently working closely with the Kenyan Ministry of Education and the Kenyan Institute of Education in the development of local contextually relevant content and teacher training for 21 Kenyan teacher-training colleges.

Mindset's partners include government, corporations, donor and development agencies, and foundations. Mindset's founding partners sit on its board of directors.

For more information: www.mindset.co.za

OLSET

The Open Learning Systems Education Trust (OLSET) has since 1992 been designing, developing, and implementing audio and print distance education programmes that reach directly into the classrooms. OLSET specialises in developing, testing, evaluating, and implementing a participatory method of teaching and learning second-language skills. The OLSET team consists of specialists in curriculum development, teacher development, open and distance learning, radio script writing, audio production, graphic arts, print production, and distribution. More recently, OLSET has embarked upon audio-visual production to enhance its in-service teacher development and support strategy.

Today, OLSET works in close partnership with the provincial Departments of Education in South Africa, primarily to:

- Develop, strengthen, and support learner-centred teaching skills among the country's primary school teachers, consistent with the pedagogy of the new constructivist curriculum
- Produce and deliver high-quality audio and integrated print support materials to learners and teachers, especially those in poorly resourced schools located in disadvantaged urban and remote rural communities across the country
- Design, produce, and broadcast interactive radio instruction programmes through the public broadcaster (SABC) effectively offering all teachers easy access to much-needed daily classroom support, regardless of distance and geographical location
- Deliver new curriculum content through use of appropriate ICTs enhancing equitable access for marginalised rural classrooms without compromising the quality of instruction and supportive print materials
- Ensure children attain the competent English language skills necessary for understanding concepts in science, mathematics, and other learning areas at senior primary grades
- Ultimately assist governments and development agencies to facilitate replication of this affordable, high-impact, learner-centred methodology, especially in Africa and developing countries further afield.

For more information: www.olset.org.za

Thutong Portal

The Department of Education, in collaboration with provincial Departments of Education and other stakeholders, developed a National Educational Portal called "Thutong." The portal aims to provide access to a wide range of curriculum and support material that are contextually relevant to South African learners, educators, education managers/administrators, and parents, and which are quality assured by experts field. By August 2006 there were 15,843 registered users and 18,535 content resources tagged to the National Curriculum Statement on the portal.

For more information: www.thutong.co.za

Current ICT Initiatives and Projects: Higher Education

While references to ICTs in higher education are made in a host of historical policy documents on higher education, these policies are not co-ordinated and South Africa does not have a coherent policy that promotes ICTs in higher education explicitly. South Africa's 24 state-funded tertiary institutions and private institutions do, in varying degrees, have policies, strategies, or programmes in place related to ICTs. Cerniewicz, Ravjee and colleagues[33] provide a taxonomy of institutional policy approaches adopted by South Africa's state universities which range from formal explicit policies on ICTs to the incorporation of ICT in existing policies to no policy frameworks to those who have structures in place but which are not supported by policy frameworks. They also point out that the use of technology is defined more by the nature of the institution than by policies, referencing the University of Stellenbosch's E-Campus Strategy incorporating all e-learning business and the University of Pretoria's Telematic Learning and Education Innovation Strategic Plan 2002-2005, which outlines an integrated approach to the quality of teaching and learning practices.

The University of Cape Town has an educational technology policy that outlines an integrative approach to the use of technology, and the University of the Western Cape Integrated Information Strategy (2002) forms the basis of its e-learning strategy as an implementation goal. Some universities, such as the Universities of Fort Hare and Free State, have policies in draft form. An example of a university programme in place is the Tshwane University of Technology's Teaching, Learning and Technology programme.

Some universities affected by the national Department of Education's merger programme, such as the recently formed University of Johannesburg and the University of Kwazulu Natal, have policies that resides historically with the more privileged university before the mergers occurred. And some universities, such as like the University of Witwatersrand, have no policy framework.

The AVOIR Project

The African Virtual Open Initiatives and Resources (AVOIR) Project, initiated by the University of the Western Cape (UWC), is a collaborative effort among several African higher education institutions. It attempts to create educational and business opportunities that contribute to the development of Africa through Free and Open Source Software (FOSS) development activities. It has taken an existing e-learning platform application, Knowledge Environment for Web-based Learning (KEWL) that was developed at UWC, and rebuilt it to run on a FOSS platform. The new version of the software, KEWL.NextGen, is based entirely on FOSS and has an innovative modular architecture that is implemented using a model-view-controller (MVC) design pattern that offers great flexibility to adapt the framework for any purpose. It also has unique features like the support of off-line authoring of content, active mirroring, and instructional design capabilities.

For more information: www.avoir.uwc.ac.za

Sakai SA

Three South African universities, the University of Cape Town, University of South Africa and North-West University, are collaborating on the deployment and extension of the Sakai Collaboration and Learning Environment (CLE).

Sakai is a global consortium of over 100 higher education institutions jointly developing an open source CLE which is used to support teaching and learning, ad hoc group collaboration, support for portfolios and research collaboration.

The South African initiative (known as Sakai SA) involves co-ordinating activities to provide mutual support and shared capacity development initiatives such as the Programmer's Cafe.

For more information: www.sakaiproject.org

Current ICT Initiatives and Projects: TVET, ABET, and Informal

In addition to a very high unemployment rate (estimated at 38.8% if the broad definition of unemployment is applied),[34] South Africa also suffers from a severe skill deficit with strong biases against women and people in rural areas among whom higher levels of unemployment and employable skills shortages are expressed. A recent report by the Human Sciences Research Council (HSRC) shows that South Africa faces a shortage of artisans. Each year, approximately one million young people leave school. Of these only about 19% enter formal further or higher education. The remaining 81% enter the job market armed only with Grade 12 or lesser qualifications. The legacy of apartheid has left a segmented labour market with strong gender and racial biases expressed in the concentration of black and women workers in the lower-paying, informal, and less skill-intensive echelons of the occupational hierarchy. South Africa also has a very high functional illiteracy rate among adults.

There is no comprehensive ICT policy and strategy within this sector. Such policies would be contained within South Africa's existing multifaceted approach to skills development which is embedded in its National Qualifications Framework including the establishment of a National Qualifications Authority, dedicated sectoral skill training authorities referred to as Sector Education and Training Authorities (SETAs), and the inclusion of learnership programmes for young people within firms.

South Africa's skill development strategy also includes intermediate and high skills development in the technical colleges and in higher education, especially at universities and universities of technology, as well as strategic partnerships between government, business, civil society, and local communities to create jobs and reduce unemployment.

Historically, this sector had ICT programmes that focused on establishing telecentres and multi-purpose community centres (MPCCs) as ICT access points for youth, women, and unemployed community members. The MPCCs were targeted as open and distance learning centres that also supplied training in employable skills. A few MPCCs are continuing to play this role.

Technical Vocational Education and Training

ASGISA

The Accelerated and Shared Growth Initiative for South Africa (ASGISA), mentioned earlier, also focuses on programmes to accelerate the development of skills. These include immediate and medium-term measures to acquire skills needed for the implementation of ASGISA projects and the economy in general. They include:

- The QIDS-UP programme aimed at achieving high levels of literacy and numeracy in the lowest schooling grades
- The Maths and Science Dinaledi programme for 529 high schools to double maths and science high school graduates to 50,000 by 2008
- An upgraded career guidance programme
- A huge upgrading of the further education and training colleges
- The adult basic and education training programme to be ramped up, based on a model developed in Cuba and New Zealand

The other cornerstone of ASIGSIA is the Joint Initiative for Priority Skills Acquisition (JIPSA) which is led by a committee of the deputy president, key ministers, business leaders, trade unionists, and education and training providers and experts to identify urgent skills needs and effective solutions such as special training programmes, bringing back retirees or South Africans and the African diaspora, and drawing in new immigrants where necessary. It also aims to include mentoring and overseas placement of trainees to fast track their development. JIPSA was targeted to have an initial timetable of 18 months, starting in March 2006, after which its future will be reviewed. Understandably a key consideration in the JIPSA strategy is be a central role for ICTs, although this is not clearly stated.

ICT Charter

In 2005, after consultation with stakeholders over several months, the Empowerment Charter for the ICT Sector was adopted by firms in the ICT industry. The main elements of the charter include transformation indicators such as ownership, management and control, skills development, employment equity, enterprise development, preferential procurement and social investment.

For more information: http://www.ictcharter.org.za/

ISETT SETA

The ICT sector has its own dedicated SETA known as the Information Systems Electronics, Telecommunications Technologies (ISETT) SETA, which seeks to develop South Africa into an ICT knowledge-based society by encouraging more people to develop skills in the sector as a means of contributing to economic growth. The ISETT SETA's mission is to generate, facilitate, and accelerate the processes of skills development for workers at all levels in the ISETT sector by linking future technology

trends with new skills development programmes.

For more information: www.isett.org.za

Adult Basic Education and Training (ABET)
There are a limited number of organisations and programmes that focus on adult basic education and training and, of these, only a few have dedicated ICT programmes integrated within them. Organisations like Project Literacy[35] have run various programmes to promote literacy and numeracy among adults but with no explicit ICT focus. A number of provincial Departments of Education have ABET programmes with dedicated centres for open and distance learning for adults. Many of these are equipped with computer labs and some have Internet access and provide training programmes in the communities. The Bridges to the Future Initiative was launched in 2005 as part of a four-country programme. It aimed to develop tools to improve basic education and literacy, initially in Limpopo Province; develop community learning and technology centres (CLTCs) for lifelong learning and income-generation within MPCCs, secondary schools and other available sites; and develop specialised ICT-supported tools for improving the quality of human development in health, agriculture, HIV/AIDS prevention, etc. Throughout these phases, the BFI intended to utilise ICTs as "enablers" both to deliver resources and to monitor progress and effectiveness of the results. Support of the BFI-South Africa came from the World Bank, USAID, the US Department of Education, and MicroSoft.[36]

Media Works
Media Works is an established company that specialises in providing National Qualifications Framework-aligned training for (ABET) and learnerships. They provide both face-to-face classes and computer-assisted learning through multimedia programmes with workbooks and facilitator sessions.

Media Works creates customised educational solutions for their clients by integrating technology, courseware, and support services that are designed to meet the specific educational needs of adults. The services provided include initial implementation, consultation, full facilitator training, on-site start-up and training for company staff, and continued assistance and support through telephone calls and on-site visits. The Media Works programmes are currently used as a significant instructional resource by over 100,000 learners across Southern Africa.

Media Works has 10 years' experience in the industry, a national base of over 2,000 corporate clients, and more than 100,000 active learners.

For more information: www.mediaworks.co.za

Informal

Digital Doorway
Considered the South African equivalent of the "Hole in the Wall" project piloted in

India, the Digital Doorway is an initiative of the Centre for Scientific and Industrial Research (CSIR) and the Department of Science and Technology with the objective of introducing computer literacy to rural and disadvantaged communities by making computer equipment and open source software available in computer kiosks. The idea is to allow people to experiment and learn without formal training and with minimal external input. The concept is referred to as "minimally invasive education." The project introduced a three-terminal configuration with one functioning as a server encased in a blue steel enclosure with vandal-proof metal keyboards, LCD screens, Web cams, speakers, and uninterruptible power supply. One hundred and twenty-two sites have been commissioned to have access to the technology of which 50 have already been rolled out throughout the country.

For more information: www.digitaldoorway.org.za

Ditsela

South Africa boasts a strong trade union movement with dedicated trade union training institutions of which Ditsela ranks among the largest and most established. Ditsela is the creation of the major trade union federations in South Africa: the Congress of South African Trade Unions (Cosatu) and the Federation of Democratic Unions of South Africa (Fedusa). Ditsela's central objective is to help the labour movement build its capacity to be able to respond effectively to the challenges it faces. To achieve this Ditsela runs programmes in education and training and provides support for organisational development. Ditsela has dedicated programmes aimed at training shop stewards, trade union organisers, and trade union leadership. One of its key projects is Computers in Education, established in partnership with the DGB Bildungswerk, the German Trade Union Federation, which aims to explore how best computers and other forms of technology can be used as a tools in delivering trade union education.

For more information: www.ditsela.org.za

Enablis

Conceived at the 2002 G8 Summit, Enablis was founded by the Canada Fund for Africa, Accenture, Hewlett-Packard, and Telesystem as a ground-breaking private sector-led non-profit organisation that aims to help entrepreneurs in developing countries. Enablis South Africa (Enablis SA) is the first regional hub in the Enablis network, with offices located in Cape Town, Johannesburg, and the Northern Cape. The member network in South Africa has over 150 members, of which close to 30% are women entrepreneurs, 22 full-time employees, and close to 20 business coaches and area specialists that provide support services such as coaching, mentoring, networking, trading, and financing.

For more information: www.enablis.org

SANGONeT

Founded in 1987, SANGONeT is one of oldest NGOs in South Africa involved in the field of ICTs. SANGONeT supports a range of NGOs and community-based organisations with ICT products and services, including training. It established the

SANGONeT NGO Portal in October 2005 in response to the challenges facing the local NGO sector. The portal represents the culmination of SANGONeT's years of experience of working in the online environment. It aims to develop the institutional capacity of the NGO sector by providing information that is intended to support stronger management practices, map NGOs and their activities through one of the most comprehensive databases in Africa, create a community space for civil society exchange, and promote the benefits of ICTs in support of the work of civil society.

For more information: www.sangonet.org.za

Women'sNet

Women'sNet is an NGO that promotes gender equality and justice in South Africa through the use of ICTs by providing training and facilitating content dissemination and creation that supports women, girls, and women's and gender organisations and networks to take control of their own content and ICT use.

Women'sNet services include technology planning especially in creating awareness of free and open source software solutions, training on the strategic use of technology to meet the needs of women, Web site planning and development, and promoting communication and network support. Women'sNet also has a dedicated technology training centre with 18 computers networked on an open source platform.

For more information: www.womensnet.org.za

Implementing ICT in Education: What Helps and What Hinders?

It is evident that ICTs are considered a priority at national government policy level. Within the education sector in particular, South Africa has a well-designed policy framework for the schools and FET college sectors, but does not have a comprehensive policy that incorporates higher education, ABET, and technical vocational education and training.

The schools sector takes the lead in the implementation process, with established machinery in the form of National and Provincial Department of Education programmes. There are also evolving models promoting school leadership in the access and use of ICTs in support of learning and teaching. The degree of implementation varies from province to province depending largely on the leadership, skills base, and human resource capability available in the Provincial Departments of Education. Indeed the absence of leadership and human resources to manage and support ICT programmes have proven to be major constraining factor to the successful rollout on a province-wide scale for many provinces. The schools sector is set to thrive and grow over the coming period as the provinces continue with mass rollout programmes to reach all their schools and FET colleges with potential budgetary support from the national Department of Education and the Department of Treasury. ICT access in schools is set to increase along with teacher access, training, and professional development. South Africa's infrastructure and ICT access strategy will potentially leapfrog over the next few years in view of government's ASGISA programme goal to promote broadband access across the country. A number of

municipalities have programmes in place to promote WiMAX and broadband access.

Historically the lack of national co-ordination and facilitation functioned as a major constraining factor as various appendages of government, civil society, and the private sector operated in isolation from one another. However there appears to be gravitation towards collaboration between the Departments of Education, Communication, Science and Technology and Treasury, the private sector, and civil society institutions. A stronger role by the National Department of Education in facilitating between collaborating agencies is likely with a potentially larger number of dedicated staff based at the NDOE to support national co-ordinated and collaborative efforts. The tender released by the NDOE calling for strategic advisors suggests a range of mechanisms that may precipitate central co-ordination across the different components and value chain activities related to ICTs in education. This may include, among other things, a central agency to integrate ICT and curriculum and to monitor and evaluate ICT in education programmes in South Africa.

There are also likely to be greater attention to the role of ICTs in enabling quality learning and teaching and improving performance in schools with a stronger emphasis on monitoring and evaluation, impact assessment, and quality assurance.

As for the integration of gender equality and women's/girls' empowerment in the ICT for education sphere, a recent study[37] suggests that there are limited targeted interventions that promote girls and women in particular. A number of programmes have tended to incorporate gender equality considerations in their project design but there are limited studies that demonstrate the effects of such an approach. The study calls on focused interventions in promoting girls in maths, science, and technology programmes and ICT careers.

Funding mechanisms in support of ICTs in education have ranged from small budgets for ICT infrastructure rollout to dedicated budgets more specifically in support of ICTs for learning and teaching by some Provincial Departments of Education such as in the Western Cape and Gauteng. In the absence of a national budget, schools have also been dependent on donations from parents and the donor and private sector community. The national budget in support of ICT integration in learning and teaching in schools is also set to increase, which in turn will support the provinces in their delivery mechanisms.

While the schools and FET college sectors are set to strive, the other sectors of the education system have significantly less co-ordinated leadership and support. A national education system-wide, co-ordinated effort that encourages both the cognitive development of South Africa's youth and their employability and skills development through ICT-enabled lifelong learning, remains a critical challenge given South Africa's highly skewed youthful population.

Appendix A: Additional Initiatives

Project Title	Project Description	Partners	Managing Agency	Geographic Scope	Web site
Community Education Computer Society (CECS)	NGO promoting access to training on ICTs in southern Africa	OSISA	CECS	Southern Africa	www.cecs.org.za
ICDL Foundation	Certified courses based on an end-user standard on ICTs training	Tuxlabs	Computer Society of South Africa	National and Africa	www.icdl.org.za
Computers for Kids	Proprietary content based on UK curriculum localised for South Africa	Tuxlabs		South Africa and a few African countries	www.computersforkids.co.za
Education Development Support Centres	Community-based PC labs to support various community groups with many based at schools	North West Provincial Deparment of Education, Royal Netherlands Embassy	North West Department of Education	North West Province	
Edupac	Education management information system products to schools	Tuxlabs	Edupac Pty Ltd	South Africa	www.edupac.co.za
Dinaledi	Promotes improved performance in math and science	Various private sector and NGO partners	National Department of Education	National	
Telkom Schools	Promotes access to ICTs, content and training to South African schools	Telkom Foundation	Telkom Foundation	National	www.telkomfoundation.org
Linuxchix	Promotes skills in open source software among women	OSISA FOSSFA	South Africa and Africa	South Africa and some African countries	www.linuxchix.org
Ungana Afrika	Promotes ICT skills support among NGOs	OSISA and Finnish Embassy	Ungana Africa	South and southern Africa	www.ungana-afrika.org
Computer Aid International	Sources, refurbishes, and	OSISA	Computer Aid International	South Africa and some	www.computeraid.org

Project Title	Project Description	Partners	Managing Agency	Geographic Scope	Web site
	deploys PCs to schools and conducts training		southern Africa	African countries	
Digital Links	Refurbishes and deploys PCs to schools and conduct training	Digital Links UK	Digital Links South Africa	South Africa and some African countries	www.digital-links.og
NEPAD e-Schools	Demonstration Project in six schools	eAfrica Commission National Department of Education Cisco Microsoft Oracle	Department of Education	South Africa	www.eafricacommission.org
NetDay	Sources, refurbishes, and deploys PCs to schools and conducts training	SchoolNet South Africa	Netday Pty Ltd	South Africa and some African countries	www.netday.org.za
Learning Channel Online		Liberty Foundation	Learning Channel Campus	National	www.learn.co.za
LearnThings	Produces interactive e-learning curriculum materials and offers training related to effective use of these materials.	Sasani family of companies; Microsoft Partners in Learning, Oracle	LearnThings Africa	South Africa and some African countries	www.learnthings.co.za
Naledi 3D Factory	Simulation and modelling solutions	UNESCO, WK Kellog Foundation, andWorld Links	Naledi 3D Factory (Pty) Ltd	National and some African countries	www.naledi3d.com
Riverbend	Specialises in the design, development, and implementation of education and training solutions	Riverbend Foundation	Riverbend Pty Ltd	National	www.riverbend.co.za

Project Title	Project Description	Partners	Managing Agency	Geographic Scope	Web site
Southern African Institute for Distance Education (SAIDE)	Research on ICTs in education in southern Africa and Africa	Commonwealth of Learning, UNESCO, and Open University	SAIDE	National and Africa	www.saide.org.za
Society and Network for Technology in Education through Collaboration (SANTEC)	An enabling network of educational technology practitioners and institutions in southern Africa	Volunteers	SANTEC Secretariat	Africa	www.santecnetwork.org
iCommunity	Promotes ICT access and skills training	Formerly HP Mogalakweni Municipality	Mogalekweni Municipality	Mogalekweni, Limpopo Province	http://www.hp.com/e-inclusion/en/project/project_mogalakwena.html
Ulwazi Project	Broadband e-learning pilot project using a Motorola Canopy Radio Network	Motorola Foundation Meraka Institute Department of Communications Omega Digital Technologies SchoolNet South Africa St Albans College	Meraka Institute	Pretoria But second phase includes Mpumulanga Bronkhurstspruit, Witbank and Middleburg regions	http://www.ulwaziproject.co.za/

Notes

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ICT in Education in Sudan

by Amr Hamdy
June 2007

Source: *World Fact Book* [1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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Overview

Sudan's experience of the last two decades in building and capitalising on ICT as a gateway for sustainable development is a landmark in the country's history. The institutional, legal, and regulatory frameworks were reformed to advance ICT as tools for integrating the economy into the global market.

The Sudanese government has budgeted future revenues for infrastructure refurbishments, and a multi-donor trust fund (MDTF) – administered by the World Bank – was created to support development projects. Investments from the MDTF will be divided between the Government of Southern Sudan (GOSS) and the national government in Khartoum. In November 2005, the MDTF gave the first disbursement of $20 million to the GOSS for the rebuilding of health and education services.[2]

However, the full potential of ICT is greatly hampered by the lack of capacity of communities to make the best use of the services. Therefore, UNDP is intervening to assist the government through its ICT institutions to promote ICT for human development.

Country Profile

Sudan is the largest and one of the most diverse countries in Africa, home to deserts, mountain ranges, swamps, and rainforests**.** With a unique position in the northeast of Africa, Sudan plays a major role in the diffusion of civilisation, exchange of culture, and knowledge into and from Africa.

Sudan is a tolerant multi-racial society with a variety of cultures and ethnic minorities. Sudan has experienced two major conflicts: a civil war involving southern Sudan, and a complex, multi-party armed struggle in Darfur. Both have hindered development and resulted in a general deterioration of security infrastructure and conditions in some regions. After two years of negotiation, the government and rebels signed a comprehensive peace agreement in January 2005.

Table 1 provides some selected socio-economic indicators for the country.[3]

Table 1: Socio-economic Indicators: Sudan

Indicator	
Religions	Sunni Muslim 70% (in north); Christian 5% (mostly in south and Khartoum); indigenous beliefs 25%
Languages	Arabic (official); Nubian; Ta Bedawie; diverse dialects of Nilotic; Nilo-Hamitic; Sudanic languages; English

Population	41,236,378 (July 2006 est.)
Population growth rate	2.55% (2006 est.)
Literacy	Male: 71.8% Female: 50.5% Total population: 61.1% (2003 est.)
GDP (US dollars)	$25.5 billion (2006 est.)
GDP per capita (US dollars)	$2,300 (2006 est.)
Labour force	7.415 million (1996 est.)
Unemployment rate	18.7% (2002 est.)

The Education System

In 1991, a new education philosophy was introduced to provide a frame of reference for the reforms. Education was to be based on the permanence of human nature, religious values, and physical nature.

The educational ladder was changed in Sudan in 1991 from 6-3-3 to 2-8-3 to include two-years of pre-school, eight years of basic, and three years of secondary school. Following a political decree by the Higher Authority of Arabization, Arabic was made the official language of teaching and scientific curriculum at the governmental higher education institutions.

Table 2 provides a quantitative perspective of some selected system indicators.[4]

Table 2: Selected Education Data

Institution	Total
Public schools	11,752
Private schools	1,035
Technical schools	81
Others	5,808
Number of school students for all levels	4.6 million
Public universities/higher institutions	27
Private universities/higher institutions	47
Technical	6
Number of university students	446,998
Public schools with computer labs	4,363
Private schools with computer labs	647
Technical schools with computer labs	20
Schools with Internet connection	20
Public universities with computer labs	27
Private universities with computer labs	47
Public universities with Internet connection	20
Private universities with Internet connection	47

Technical secondary schools enroll students who fail to continue their academic education. These schools meet the country's needs of specialists, technicians, and experts in the different technical fields. Schools of general education for both sexes are currently covering and servicing the entire country.

The 5,808 other informal education institutes, such as religious institutes, youth centres, national industries, and professional training institutes, are not under the supervision of the Ministry of Education. However, their high-achieving graduates are offered a chance to join a number of universities and higher institutes.[5]

Education is financed by government, parents, councils, and some NGOs. General education in Sudan is not compulsory.

Table 3 provides data on school enrolment and attendance.

Table 3: School Enrolment and Attendance[6]

Education Statistics	Percentage
Primary school enrolment ratio 2000-2005, gross, male*	64
Primary school enrolment ratio 2000-2005, gross, female*	56
Percent of primary school entrants reaching Grade 5, 2000-2004	92
Secondary school enrolment ratio 2000-2005, gross, male*	34
Secondary school enrolment ratio 2000-2005, gross, female*	32

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.

ICT Policies

National policy

In June 1999, the Sudanese national ICT strategy was formulated and a high-level ministerial committee was formed to oversee its implementation. The strategy focuses on five major areas: technology (infrastructure), human resource development, software industry development, content (Arabic reservoir), and geo-information.

Based on the knowledge and recognition of the importance of public-private partnerships in enhancing any development process, the Sudanese government is constantly seeking partners to implement the national strategy, including e-government projects, the development of an electronic smart city, distance learning, and telemedicine.

The General Ministry of Education Information Centre is the entity responsible for the development of a strong ICT infrastructure. The national policy encourages the use of ICT in developing local policies to ensure the complete integration of ICT in education and training on all levels, including the development of school curricula, teacher training, managing and organising educational institutions, and supporting the idea of lifelong learning by designing ICT training programmes to satisfy the educational needs of employees working in the field.[7]

Education Sector Policy

The ICT policy for education was launched in 2002. The Information Directorate and Curriculum Centre and Training Directorate are the entities managing the implementation. In 2004, ICT was introduced in secondary education curricula. A number of computers were installed in schools (around 50% of secondary schools), at an average of 10 computers per school. In schools the connectivity is mainly through dial-up and ADSL. However, in higher education systems, it is through ADSL only. The country is planning to have computers available in all education levels by the year 2015 as agreed to at the ICT summit in Geneva.

The ICT curriculum has been introduced at Grade 4. The teachers have been trained on the basics of ICT. Both the government and the private sector provide access to the Internet as a learning resource.[8]

Infrastructure

In the last two decades Sudan built and capitalised on ICT, and the government has opened up competitive investments in telecommunication. Licensing was granted for newcomers employing advanced technologies, which are hoped to increase the spread of and access to ICT and make products affordable.

Development in ICT in Sudan is evident in a substantial expansion of infrastructure and capital investment including management systems and human capital.[9]

Radio stations

Following are three examples of radio use in Sudan:

- *Civic Education via Radio for Southern Sudan:* In partnership with the National Democratic Institute (NDI), Education Development Center Sudan Radio Service has developed a new civic education radio series that will increase listeners' knowledge of political developments and also promote increased discussion of political developments, tolerance of diverse viewpoints, and non-violent solutions to complex problems.
- *Sudan Radio Service:* As part of an effort to increase the participation of the southern Sudanese, the Sudan Radio Service provides access to balanced and useful information through radio-based education and entertainment programmes presented by local presenters in several local languages.
- *dot-EDU Southern Sudan Interactive Radio Instruction (SSIRI) Program:* This programme designs, develops, and pilot-tests appropriate and cost-effective

technologies such as interactive radio instruction in an effort to provide learning opportunities for children, adults, and teachers in southern Sudan.[10]

Table 4 provides a snapshot of the state of ICT infrastructure in the country.[11]

Table 4: ICT in Sudan

Indicator	
Telephones - main lines in use	670,000 (2005)
Telephones - mobile cellular	1.828 million (2005)
Radio broadcast stations	AM 12; FM 1; shortwave 1 (1998)
Television broadcast stations	3 (1997)
Internet users	2.8 million (2005)
Computer penetration	3 per 1000 inhabitants
ADSL	Introduced in 2004

Current ICT Initiatives and Projects

A major contributor to the development projects and initiatives undertaken to help Sudan emerge from its current situation is the Sudan Multi-Donor Trust Funds (MDTFs), which provide an avenue for donors to co-ordinate and create synergies on initiatives and projects for the reconstruction and development needs of both northern and southern Sudan.

The MDTFs are funded by donor countries and managed by two technical secretariats, one that which focuses on war-affected areas of northern states (based in Khartoum), and a second for southern Sudan (based in Juba). Both trust funds provide funding for priority projects and programmes that are both pro-peace and supportive of poorer areas.

Table 5 summarises the current and recent ICT initiatives and projects in Sudan.

Table 5: ICT Initiatives and Projects

Programme	Description
Computers in educational institutes	The Ministry of Education has started providing schools and teachers' institutes with computers. An order to import 10,000 or more computers has been placed to provide the rest of the educational institutions with computers. There is an initiative for developing an educational management information system. *Partners/donors:* Ministry of Education in collaboration with UNESCO and UNICEF Khartoum.
The development of an ICT system	The system will connect schools, process exam corrections, and display the grades of the Sudanese Certificate on-line.
EMIS Project	This project will connect school localities and states on the

	national level. The project will start in 2007 after signing the agreement. *Partners/donors:* Collaboration between UNICEF, EU, and the Education Planning Directorate.
Open University of Sudan Development	CfBT Education Trust is a leading education consultancy and service organisation that has undertaken two consultancies for the Open University of Sudan in Khartoum, providing training for trainers and advice on the curriculum for the OUS on its recently introduced distance learning programme to improve the methodology and subject knowledge of English-language teachers working at primary and secondary schools throughout the country.[12]
Reconstruction of basic education in Sudan	In 2005 UNESCO contributed its technical expertise to the preparation of a programme for the reconstruction and development of basic education in Sudan. *Partners/donors:* UNESCO
Multi-purpose Community learning centres (MCLCs)	MCLCs are local centres that provide lifelong learning opportunities to empower local communities in villages, slums, and poor urban areas. MCLCs provide education combined with skills and training for income-generating activities leading to improving the quality of life of poor people. Several MCLCs have been set up in Lebanon, Syria, Palestinian Camps, Egypt, Sudan, Morocco, and Yemen. *Partners/donors:* UNESCO
Focusing Resources for Effective School Health (FRESH)	This is a project to assess health education and HIV/AIDS prevention education in schools of the Arab world. The goal is to develop a common plan of action that will help address existing needs, particularly in the areas of information-sharing and training.
Center of Learning	This is an initiative for developing the learning resources through the national commission for UNESCO in Sudan. The infrastructure is being developed through the efforts of the government to get loans and assistance from NGOs.[13]

Implementing ICT in Education: What Helps and What Hinders?

Table 6 provides a summary of the current stage of ICT development in Sudan in terms of enabling or constraining features in the education system.

Table 6: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features

Policy framework and implementation plan	The national ICT policy was formulated mid-1999 and followed in 2002 with a national ICT policy on education, targeting mainly infrastructure, access, developing content, and human resource development.	Outreach to rural and remote areas still poses a considerable challenge. Poverty, lack of resources, and political unrest puts ICT lower on the priority list of basic needs in most areas of Sudan.
Advocacy leadership	A high ministerial committee was formed to oversee the prompt implementation of the national ICT policy, as well as the supervision of the Information Directorate and Curriculum and Training Directorate for the implementation of the education ICT policy.	Political unrest and civil war hinder nationwide implementation.
Collaborating mechanism	The Sudanese government has budgeted future revenues for infrastructure refurbishments and a multi-donor trust fund (MDTF) was created to support development projects. The UNDP is also supporting the government heavily through its ICT institutions to collectively share the interventions that promote ICT for human development.	
Human resources	One of the major areas of concern of the national ICT policy formulated in 1999 is human resource development.	Skilled, trained staff who are well acquainted with the ICT tools are very limited. They also tend to prefer the private sector to government positions.
Support	The government encourages investment and is paving the road for public-private partnerships as a means of offering more venues and creating better opportunities for the implementation of the ICT vision. Sudan is increasingly attracting attention from international investors interested in the oil revenues. These have attracted investment from Kuwait and UAE, and open the door for encouraging more investment.	Financing and donor interest in Sudan remains limited, especially with the number of embargos that were imposed.
Rural/urban divide	The efforts of the government	There is a huge digital divide

	remain focused on outreach to all parts of the country.	between rural and urban areas, especially in relation to computer literacy, and access to telecommunication infrastructure countrywide remain alarmingly low.
Learning material	Provision of content is among the five founding pillars of the national ICT policy. The government is focused on building a strong reservoir of Arabic content reflecting the culture and tradition of the region, and being accessible to a wide population.	Arabic electronic content greatly lags behind. Educational material and curriculum need total restructuring and rebuilding. Traditional and longstanding material and curriculum are still in use, which do not comply or meet with the needs of modern society.
Gender equality	A number of informal education projects target women as an under-served sector of the society. Women's participation and inclusion is also slowly increasing on the government level.	Female participation in public life in general and education and in the workforce in particular remain fairly low due to longstanding cultural factors and traditions.
Sustainability	The peace treaty signed in 2005 sets the grounds for more stable implementation of projects in different domains. A number of international development agencies, NGOs, and civil society organisations are dedicated to the development process with particular emphasis on education.	The political instability in Sudan is a great hurdle that impedes the development process.

Notes

[1] The World Factbook 2007. https://www.cia.gov/cia/publications/factbook/geos/sd.html
2 Energy Information Administration (EIA). http://www.eia.doe.gov
3 The World Factbook 2007. https://www.cia.gov/cia/publications/factbook/geos/sd.html
4 Ministry of Education. *Education Statistic Yearbook* 2004-2005, 2002-2003; Khartoum.
5 Ministry of Higher Education. Statistic Yearbook 2002- 2003; Khartoum, Sudan.
6 Sudan. UNICEF. http://www.unicef.org/infobycountry/sudan_statistics.html#26
7 Sudan. United Nations Economic Commission for Africa (UNECA). http://www.uneca.org/aisi/nici/Sudan/sudan.htm
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12 Training Programme for the Open University of Sudan (OUS). 2004. CfBT Education Trust. http://www.cfbt.com/train/supportingteachers/pastprojects.aspx
13 UNESCO. www.unesco.org

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ICT in Education in Swaziland

by Shafika Isaacs
April 2007

Source: *World Fact Book*[1]

Please note:

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Overview

Swaziland is a small, deeply impoverished, drought-stricken country with a weak ICT infrastructure. The Swazi government introduced a draft national ICT policy in 2006 and the country has a very small number of ICT for education programmes under way of which the Computer Education Trust and various programmes at the University of Swaziland are the most known.

Country Profile

Swaziland is one of the smallest, landlocked countries on the African continent. While considered one of the wealthier nations in Africa, it remains one of the poorest in the world. Seventy percent of Swazis live in rural areas. A continuing drought has resulted in a food crisis that threatens hundreds of thousands or people with hunger. The unemployment rate is approximately 40%, and nearly 70% of the population live on less than a dollar per day. Economic growth has wavered in the past few years, exacerbated by the economy's inability to create new jobs at the same rate that new job seekers enter the market. This situation is due largely in part to the population growth rate, which strains the natural resources and the country's ability to provide adequate social services, such as health care and education. Overgrazing, soil depletion, and floods are persistent problems. Largely as a result of having the world's highest rate of HIV infection, Swaziland has the lowest life expectancy on the planet: just 32.62 years. This is expected to drop to just 29 years by the year 2010.[2]

Table 1 provides a brief overview of basic socio-economic indicators for the country.

Table 1: Socio-economic Indicators: Swaziland

Indicator	
Population	1.1 million (2005)
Languages	Official languages: English and siSwati. Other languages: Tsonga and Zulu
2005 Economic activity (% of GDP)	Agriculture: 11.6% Industry: 48.0% Services: 40.4%
Human Development Index	146 (out of 177 countries)[3]
Per capita gross national income (US dollars)	$1,700 (2004); $2,280 (2005)

The Education System

Education and training is divided into four main sub-sectors in Swaziland:

- Early childhood care and development (ECCD)
- Primary education
- Secondary education
- Post-secondary education

Primary education in Swaziland is seven years with the age range from six to 13 years. Parents have always contributed towards primary education by paying school fees and contributing to a building fund (for construction of school facilities). As a measure to reduce the cost burden to parents, the Government of Swaziland now provides free textbooks to all primary school pupils and offers bursaries for destitute and orphaned children. The government is also exploring the possibility of providing primary school pupils with stationery.[4]

Secondary education is divided into two sub-systems: three years of junior secondary and two years of senior secondary.

Post-secondary education consists of tertiary education and vocational education, which is offered by various institutions.

In 2001 there were 723 schools in Swaziland: 541 primary and 182 secondary. Swaziland has one national university as well as teacher-training and nurse-training colleges and a few skills-training institutes.

Swaziland's adult literacy rate for 2000-2004 stood at 80%. The net primary school enrolment was 77% during the same period.

Challenges

AIDS is having a devastating impact on children in Swaziland. An estimated 69,000 children have been orphaned due to AIDS-related causes, and an additional 60,000 are highly vulnerable due to the extreme poverty of caregivers, the sickness of parents, or home situations of abuse and exploitation. As a result of the impact of AIDS, more than one-third of children cannot access basic services, including health, food, education, water and sanitation, and psychosocial support. While neighbourhood care points help many of the poorest and most vulnerable to meet basic needs, they reach only about 20% to 25% of orphaned and vulnerable children. Swaziland's under-five mortality rate, estimated at 74 per 1,000 live births in 1995, now stands at 156 per 1,000.

The plight of children has been further exacerbated by successive years of drought, which have left one-third of the country's children stunted and one-third of the country's population dependent on food aid. The regional food crisis in 2006 will aggravate the situation, further increasing the burden on communities already trying to take in orphaned children.[5]

Infrastructure

The telecom sector in Swaziland features an old-style posts and telecom monopoly operator for fixed services but with private participation in mobile and Internet services. Nevertheless, fixed and mobile penetration is relatively high compared with other countries in the region. While Internet usage is growing reasonably fast, the level of penetration is still well below international standards, but about average in the region. The government is considering unbundling the national operator to create discrete telecom and regulatory entities and later privatise them.

Table 2 provides an overview of the country's ICT infrastructure indicators.

Table 2: ICT Infrastructure Indicators, 2004

Indicator	
Fixed-line subscribers	46.2 per 1,000 persons
Mobile subscribers	113 per 1,000 persons
Dial-up subscribers	19.0 per 1,000 persons
Broadband subscribers	0.0
Internet users	36.0 per 1,000 persons
Television broadcast stations	12 (including 7 relay stations)
Radio stations	AM 3; FM 2; shortwave 3

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ICT Policies

National Development Strategy – Vision 2022

The government adopted a national economic strategy called the National Development Strategy – Vision 2022 in 1997 which articulates development priorities for all economic sectors including education.

The vision of this strategy is that by 2022 Swaziland will be in the top 10% of the medium human development group of countries founded on sustainable economic development, social justice, and political stability. The strategy's vision statement also states that the focus is on quality of life, of which the critical dimensions are poverty eradication, employment creation, gender equity, social integration, and environmental protection, which are in turn linked to education, health, and other aspects of human resource development.

Important elements in this strategy are appropriate education and training (including a move away from the present academic orientation and towards a technical and vocational orientation); adequate incentives extended to businesses and households to encourage the full development of human capital; appropriate youth programmes; special attention to

members of society with disabilities; and all other areas that have an impact on the quality of human capital (health, water, sanitation, shelter, etc).

The National Development Strategy also mentions the need for the "cableway and telecommunications" sector to:

- Improve accountability and performance measures
- Strengthen the implementation of the Public Enterprise Act to attain financial and performance targets
- Streamline the regulatory framework
- Allow competition in the telecommunications industry within a conducive supervisory environment
- Base investment decisions on economic criteria
- Co-ordinate installation of communications infrastructure with national development agents
- Formulate and implement a rational communications policy
- Promote the economic empowerment of nationals by encouraging their participation in telecommunications as owners, managers, and technical operators (with foreign technical partners where necessary)
- Ensure that the telecommunications network is in line with new technological developments abroad

Draft National ICT Policy
In 2006 the Swaziland government developed a draft ICT policy document. The government has appointed a multidisciplinary team to consult with a wide range of stakeholders and ensure integration and linkages to the National Development Strategy.

Current ICT Initiatives and Projects

Computer Education Trust

The Swaziland Computer Education Trust (CET) is a non-profit organisation that was set up 1999 in Mbabane with funding from private business sources within Swaziland to address the poverty of technical education across the country's state school system. Its objective is to extend computer literacy and vocational ICT training to every child in secondary and high school in Swaziland. The computers are intended for use across the whole school curriculum with the aim of future Internet integration in education.

CET facilitates the development of the necessary pedagogical materials and the delivery of professional pre-service and in-service training (INSET) for all Swaziland teachers. CET will install a 20-PC computer lab in each of the 187 secondary and high schools across Swaziland and guarantee their sustainable use by providing full technical and maintenance back-up support facilities. CET has partnered with SchoolNet Africa and the Open Society Initiative for Southern Africa to upgrade its existing Technical Services Centre which serves to source, refurbish, and distribute second-hand computers to Swazi schools.

CET is already directly providing teacher training in ICT and is currently negotiating with the Ministry of Education to integrate this provision within the existing programme of pre-service and in-service teacher training. CET has installed 20 computers in 40 schools and is providing effective maintenance and technical support.

Teachers are given an introductory course in ICT trouble-shooting and comprehensive training in the use of computers in education specifically tailored for the Swaziland education system. Negotiations have begun, and agreement in principle reached, with the University of Swaziland (UNISWA) and the Swaziland College of Technology (SCOT) to incorporate these technical functions within the framework of the curriculum of their existing computer maintenance courses and work experience placements. This will replicate the successful South African model where diploma and degree students are given the opportunity to develop applied skills in computer installation and maintenance while establishing the capacity to deliver computer education in schools. In other words, they will actually install PCs in schools and provide technical back-up as part of their studies.[6]

CET is also a partner of SchoolNet Africa and the Open Society Initiative for Southern Africa (OSISA) with which it has supported the development of a Technical Services Centre to assist with sourcing, refurbishing and distributing PCs to schools. CET has also sourced PCs with the help of Computer Aid International, and it has partnered with the Community Education Computer Society (CECS), a South African-based NGO that focuses on the development of ICT skills in the form of literacy programmes. Swaziland is one of the six participating countries in the 80-hour programme that enables participants to use word processing, spreadsheet and presentation software; design a basic Web page using HTML; and perform basic computer troubleshooting and maintenance.

University of Swaziland
The University of Swaziland (UNISWA) is the only institution of higher learning in the country. It has three campuses situated in Mbabane, Luyengo and Kwaluseni. The university has embarked on a programme for teachers in information technology to ensure a smooth introduction of computer education in schools. It also has an ICT centre and an Institute of Distance Education which has joined the Virtual University for the Small States of the Commonwealth initiative.

For more information: www.uniswa.sz

Implementing ICT in Education: What Helps and What Hinders?

Table 3 provides a summary of the current stage of ICT development in Swaziland in terms of enabling or constraining features in the education system.

Table 5: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and	Swaziland has a draft national	

implementation	ICT policy that incorporates the education sector.	
Advocacy leadership	A dedicated task team has been established to drive the consultation and adoption of the national ICT policy.	
Gender equity		No explicit mention is made of gender equality and women's empowerment with reference to ICTs in Swaziland.
Infrastructure and access		The lack of national infrastructure seriously constrains the use of ICTs in Swaziland's education institutions.
Collaborating mechanisms	The national ICT task team is specifically tasked to engage with many stakeholders to foster collaboration.	
Human resource capacity		There remains a very limited layer of skilled personnel and champions within government to drive the national policy adoption and implementation.
Fiscal resources		There is no government commitment to spend from national budget and limited financial support for civil society organisations like CET.
Learning content		Local contextually relevant learning content is currently lacking.
Attitudes	Some champions in government and civil society are very positive about continuing to promote ICT access in Swaziland and for ICTs to be used to support education.	

Notes

1 The World Factbook 2007. https://www.cia.gov/cia/publications/factbook/geos/wz.html
2 Jones, M, "Swazi 'Aids cure' scam uncovered. BBC Newsnight, 1 December 2006. http://news.bbc.co.uk/1/hi/world/africa/6197222.stm

3 Statistics in the Human Development Report. http://hdr.undp.org/hdr2006/statistics/
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ICT in Education in Tanzania

by Harry Hare
July 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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Overview

The past few years witnessed a host of activities aimed at injecting ICT in Tanzania's education sector. From the International Institute for Communication and Development (IICD)-supported roundtable in Bagamoyo where 11 ICT for education projects were formulated to the Swedish International Development Agency (SIDA)-supported stakeholders forum of January 2005, which saw the birth of the Tanzania eSchools initiative and many other activities in between. All this has, as a result, tremendously increased the awareness of the benefits of ICT within the Education sector, not to mention the support from several development partners.

With the raised awareness the potential that ICT has demonstrated in improving the quality and access to education, the government, through the Ministry of Education and Vocational Training has recently developed an *Information and Communication Technology (ICT) Policy for Basic Education* (July 2007) that will among other things, structure the adoption of ICT within the education sector.

Country Profile

The United Republic of Tanzania was formed out of the union of two sovereign states, namely Tanganyika and Zanzibar. Tanganyika became a sovereign state on 9 December 1961 and a republic the following year. Zanzibar became independent on 10 December 1963, and the People's Republic of Zanzibar was established after the revolution of 12 January 1964. The two sovereign republics formed the United Republic of Tanzania on 26 April 1964.The Government of the United Republic of Tanzania is a unitary republic consisting of the Union Government and the Zanzibar Revolutionary Government.

Tanzania has an estimated population of 37.5 million,[2] 43.7% of which is under 15 years. The country is ranked 162nd out of 177 countries in the UNDP Human Development Index, ahead of Benin and Cote D'Ivoire.[3] The economy depends heavily on agriculture, which accounts for almost half of GDP, provides 85% of exports, and employs 80% of the workforce.

Table 1 provides some selected socio-economic indicators for the country.

Table 1: Socio-economic Indicators: Tanzania

Indicator	
Population	37.5 million (2006)
Languages	Kiswahili, English, and other local languages
Adult literacy rate	80.2 % (2004)
GDP (in US dollars)	$29.25 billion (2006)
Human Development Index	162 (out of 177 countries)
Human Poverty Index	62 (out of 102 countries)

The Education System

Education in Tanzania is managed mainly through the Ministry of Education and Vocational Training, which currently has a minister, deputy minister, permanent secretary, chief education officer, and several directors in charge of basic education, secondary education, teacher education, policy and planning, administration and personnel, inspection of schools and vocational training.[4] The ministry also has several independent agencies under it responsible for some core functions such as the National Education Council of Tanzania (www.necta.go.tz), the Tanzania Education Authority (www.tea.go.tz), the Tanzania Institute of Education (www.tie.go.tz), the Tanzania Library Services Board (www.tlsb.or.tz), the Institute of Adult Education (IAE), the Teachers Service Department (TSD), and the Agency for Development Education Management (www.ademtz.com).

Tanzania follows a 7-4-2-3 system of education. Primary schooling takes seven years, followed by four years of secondary, two years of high school (advanced level), and three years of first degree university studies. Reports from the ministry indicate that there are a total of 14,700 primary schools, 2,289 secondary schools, 20 tertiary colleges (vocational training centres), and 53 teacher-training colleges. In 2006, there were 6.7 million new enrolments in pre-primary schools, 1.3 million standard one enrolments, and 243,359 enrolments in Form one. Teacher-training colleges enrolled a total of 13,425, an increase of more than 500% from 2005.

In 2006/07, the budgetary allocation for the education sector stood at TZS958 billion (USD$740million) with 64.5% going into primary education, 12.5% to secondary, and the rest to teacher training (1.1%) and tertiary and higher education (21.9%).[5]

Table 2 provides a quantitative perspective of some selected system indicators.

Table 2: Selected Education Statistics

Indicator	
Net primary enrolment*	96.1 (2006)
Net secondary enrolment*	13.4 (2006)
Gender parity index (GPI)**	0.99
Education expenditure (as a percent of GDP)	3.9% (2004/05)

Source: Ministry of Education and Vocational Training

*Net enrolment = the percentage of school-age children currently enrolled (i.e., it does not count older learners who may be enrolled)

**GPI = the level of access by females to education compared with males.

ICT Policies

Tanzania has just finalized its *Information and Communication Technology (ICT) Policy for Basic Education* which incorporates the integration of ICTs in pre-primary, primary, secondary and teacher education, as well as non-formal and adult education. The policy has

been developed in consultation with stakeholders, including a workshop in October 2006. The policy considers issues of infrastructure; curriculum and content; training and capacity development; planning procurement and administration; management, support and sustainability and monitoring and evaluation[1]

References to ICTs are also prominent in all three policy documents that govern the education sector in Tanzania in general. These are the Education and Training Policy of 1995,[6] the Primary Education and Development Plan (PEDP) 2002-2006,[7] and the Secondary Education Development Plan (SEDP) 2004-2009.[8] All three documents emphasise the need for access to and improved quality of education for all despite the increasing numbers of enrolments. The ministry estimates an increase in enrolled pupils from just under five million in 2002 to almost eight million in 2006, which will require approximately 45,000 additional teachers.

Both the PEDP and SEDP prioritise ICT-based information management at all levels and an introduction of computer courses into primary and secondary education.

As in many other countries in Africa, implementation of ICT projects tends to precede the policy and strategy phases, thereby allowing unco-ordinated efforts and sometimes wastage due to duplication of effort. ICT in education initiatives in Tanzania started in 2002 when a stakeholders' workshop was called by the ministry with support from the International Institute for Communications Development (IICD), a Dutch NGO.[10] The round table identified areas of ICT interventions and 11 project proposals were generated. These projects helped to raise awareness of the benefits and the potential gains in adopting ICT in the education sector which in turn elevated ICT to a priority area in education planning.

ICT in Schools

Most private schools in the urban centres, especially Dar es Salaam, are already using ICTs, albeit without a formal setting or a policy framework. The impetus has come from parental pressure and the desire for students in these schools to achieve high national grades. However, even in these schools ICTs are mostly confined to administration. There is some limited use for teaching basic ICT skills, however, in most cases ICTs have not been integrated as a medium of instruction. Most of the activity is within the secondary school level, with negligible movement in primary and lower levels.

The eSchool Forum, which is comprised of ICT for education stakeholders, has formulated a five-year ICT in secondary schools programme, the eSchools Programme. This programme is meant to equip schools with ICT equipment (including access to the Internet), adopt educational management information systems at both the school and ministry level, and develop curriculum and online content for secondary schools. The programme proposal suggests a phased approach for ICT starting with 200 schools in phase one and a large scale rollout of 2000 schools in phase two with a nationwide coverage. The eSchools Programme proposal is currently under review by the MoEVT.[11]

ICT Teacher Training

The Ministry of Education with support from the Swedish International Development Cooperation Agency (Sida) initiated a programme for introducing ICT in teachers' colleges in 2005. The programme is aimed at improving the quality of teacher education by using ICTs to improve both pre-service and in-service teacher education.

The teacher training programme now forms the first phase of the implementation of the sector-wide implementation of ICT in education. This project has already started and software and hardware procurement is in progress and installation is expected to be complete for the 32 teacher training colleges by mid-2007. The colleges will be equipped with thin client computers with a server and Internet access. Tutor technicians are being trained on support and networking essentials to be able to offer installation and maintenance services to colleges[2]. –numbering of footnote??? Should point to www.teachers.or.tz

Infrastructure

The Tanzanian government issued an order to ban the use of computers and television in 1974; this order was lifted in 1984 and since then the country has been playing catch-up in its use and adoption of ICT, fortunately with renewed vigour. The country adopted a national policy in 2003 that identifies the development of infrastructure as key in the development and use of ICT in the country.[12] The policy also recognises the strategic input that ICT can have in the education sector.

The liberalisation of the communications sector gave a big boost to the development of telecommunications. The Tanzania Telecommunication Company Limited (TTCL) exclusivity period in data and voice service provision ended in 2005. This meant that new data and voice providers could be licensed to compete with TTCL. To date there are two national operators, four mobile operators, eight public data operators, and 12 Internet service providers.[13]

Table 3 provides a snapshot of the state of national ICT infrastructure in the country.

Table 3: ICT in Tanzania

Indicator	
Telephone lines	138,227 (2006)
Mobile phone subscribers	5.7 million (2006)
Internet users	333,000 (2005)
Television stations	29 (2006)
Internet hosts	8609 (2006)
Radio stations	47 (2006)

The use of ICT in Tanzanian schools is not entirely new. In the late 1960s and early 1970s primary and secondary schools were provided with radios to enable students to listen to educational programmes designed by the Ministry of Education in collaboration with and broadcast by Radio Tanzania, the state radio station.[14]

The implementation of the new ICT Policy for Basic Education will undoubtedly improve access to and use of ICT in education. The policy foresees the use of a wide range of ICTs, from radio and mobile telephony to computers and Internet, to reach educational objectives.

Other initiatives aimed at bringing ICTs into schools have been championed by several NGOs such as the Tanzania Computers Literacy in Secondary Schools Trust Fund, which procures and refurbishes computers for use in schools and which has equipped over 20 schools with computer labs and trained students to maintain the computers. The organisation has also experimented with the use of open source software and thin client technology in an effort to lower the cost of acquisition. Other NGOs active include the Tanzania Education Services Trust, the Best Education Trust Fund, and the Distance Learning Educational Services, which prepares and hosts on-line study notes and past examination papers for revision by students.

Current ICT Initiatives and Projects

There are several projects currently underway at the national level, projects that have now been included as part of the draft national ICT policy for education.

ICT Implementation in Teachers' Colleges
This is a collaborative effort between the Ministry of Education and Vocational Training and Sida aimed at introducing ICT in all teacher-training colleges in the country. The project was initiated in 2005 when a proposal was developed by Schools Online, an NGO based in the US and with offices in Tanzania at the time, and sold to the ministry as an initiative to improve access and quality of education in the country.

The programme's main goal is to improve the quality of teacher education by using ICTs in pre-service and in-service sessions. Tutors are expected to become ICT literate and able to use ICT as a tool for teaching and learning as well as for management and administration. The benefits of preparing ICT-literate teachers are expected to spill over to schools when implementing initiatives like e-school or e-learning.

For more information: www.teachers.or.tz

ICT Development in Secondary Education
The eSchool Forum which was formed after the education stakeholders workshop organized by the ministry of education in January 2005, has submitted a programme proposal to the Ministry of Education and Vocational Training. The proposal recommends the introduction of ICT in secondary education, in phases starting with 200 schools in phase 1 (2006 to 2008), a large scale rollout covering 2,000 schools in phase 2 (within five years), and nationwide coverage by 2015.

The proposal covers a wide range of activities that need to be undertaken within the programme, including ICT infrastructure development in the schools, technical resources, student management at school levels (integrated EMIS), content and curriculum

development, e-learning, sensitisation, human resources, and programme co-ordination and funding.

Education Management Information System (EMIS)
The Ministry of Education and Vocational Training is implementing a nationwide education management information system (EMIS) to produce and manage educational data and information. The EMIS is expected to collect, process, utilise, and disseminate education data to educational stakeholders on a timely basis. This project is currently being implemented at the ministry headquarters, however some regional and districts offices have been provided with computers and printers. Computer training has taken place for 19 regional education officers, 19 regional academic officers, 35 district education officers, and 34 statistical and logistics officers. Efforts are underway to ensure that the remaining districts are trained and provided with computers and printers.

For more information: http://www.moe.go.tz/ict4e

Computer Procurement and Refurbishment for Schools
This project is managed by the Tanzania Computer Literacy for Secondary Schools Trust Fund, a local NGO based in Dar es Salaam. The project procures used computers and receives donations from donors and other organisations, refurbishes these computers and uses them to equip computer labs in secondary schools. The project also trains students in basic computer maintenance so that they can become the first-level support for the labs. This project is supported by the International Institute of Communication Development.

For more information: http://www.tanedu.org/proc_computers.asp

Tanzania Education Services Web site
This Web site publishes information on the education sector in Tanzania, including information about schools, examination results, and school administration. There is a wealth of information including contact information for 1,060 schools and 47 teacher colleges. This project is supported by the International Institute of Communication Development.

For more information: www.tanedu.org

Barclays/Digital Links/TEA Computer for Schools Project
Barclays Bank and Digital Links International have forged a partnership to spur the growth of ICT in schools across East Africa. A three-year programme has set targets to place 10,000 computers in approximately 500 schools. Implementation of the programme will be through collaborative partnerships with organisations in each country. Barclays Bank East Africa has allocated UK£150,000 for the programme.

For Tanzania, the Barclays ICT project for schools is implemented by Tanzania Education Authority (TEA), Tanzania Commission of Science and Technology (COSTECH), and Mkombozi Centre for Street Children.

For more information: http://www.tea.or.tz/news.htm

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in Tanzania in terms of enabling or constraining features in the education system.

Table 4: ICT Initiatives and Projects

Factors	Enabling Features	Constraining Features
Policy framework and implementation	The new policy, when enacted and implemented, will help guide the development of ICT in education and therefore make the ministry assume leadership	The lack of a policy framework has hindered the uptake of ICT in education to date which contributed to the limited active promotion of ICTs in education within the Ministry of Education ..
Infrastructure and cost of bandwidth		Despite the liberalisation of the telecommunications sector, the cost of bandwidth is still out of reach of many schools. Rural schools that are out of the national telecommunications network need to use expensive satellite technologies.
Language of the Internet	There is an increasing interest in developing online content in Kiswahili and some applications now come with Kiswahili dictionaries. The advent of open source software has helped localise ICTs and the Internet and therefore increased access.	Language has been identified as one of the major inhibitors of ICT use in Tanzania. A majority of the population is comfortable in Kiswahili and only learns English in later years in late primary school or early secondary school.
Electricity		The national electricity grid is still limited to commercially viable areas missing out most of the schools, which are in the rural areas. This, coupled with major breakdowns and load shedding, has increased the cost of owning ICT infrastructure.
Tutor technicians		ICT in education is still a new concept. The teachers- colleges are now training teachers in ICT . A lot more effort will be required to give in-service training to

		teachers in ICT.
New technologies	There is proliferation of new technologies that are promising to drastically lower the cost of entry and ownership of ICT is schools. These include open source software and Wireless Connectivity solutions using GSM networks, which have a wider coverage in the country.	

Notes

1. World Factbook 2007. https://cia.gov/cia/publications/factbook/geos/tz.html
2. Ibid.
3. "Tanzania Fact Sheet." Human Development Report 2006. http://hdr.undp.org/hdr2006/statistics/countries/country_fact_sheets/cty_fs_TZA.html
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13. Tanzania Communications Regulatory Authority, Market Information. http://www.tcra.go.tz/Market%20information.htm
14. Senzige, J. and K. Sarukesi. "An Approach to ICT Based School Education in Tanzania." 2003. The Institute of Finance Management, Tanzania. http://www.ssn.flinders.edu.au/global/afsaap/conferences/2003proceedings/senzige.PDF
15. ICT in Secondary Schools, The e-School Program. Presentation by C. Philemon et al. Rural Connectivity Workshop, Dar es Salaam, May 2006.

[1] Ministry of Education. http://www.moe.go.tz/ICT4E/ICT4E.html

[2] WaKute. http://www.teachers.or.tz/

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ICT in Education in Togo

by Osei Agyeman-Duahl

May 2007

Source: *World Fact Book*[1]

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Overview

Although Togo has no ICT policy in place, a revision to the education policy in 2003 makes reference to the need provide ICT orientation and training for students. However, the lack of resources is constraining government efforts to take significant action. NGOs are active in terms of obtaining computers for a few schools and some private school sare able to maintain computer labs by charging extra fees – a practice that is not affordable for most students in the public system. The Agence Universitaire de La Francophonie (AUF) actively working with several higher education institutions to provide access to computer facilites with high speed Internet connectivity. Television has also been used to train teachers in pedagogy.

Country Profile

The Republic of Togo is located between Benin and Ghana in West Africa and borders the Bight of Benin in the south. The country consists primarily of two savannah regions separated by a southwest-northwest range of hills (la Chaine du Togo).

Togo is commonly divided into six geographic regions. In the south are the low-lying sandy beaches. The coastal region is narrow, and there are a number of lakes, the largest of which is Lake Togo. The three major languages are Ewe, Kabye, and Mina.[1,2]

The main export of Togo is phosphate, which accounts for 40% of export revenue. Eighty percent of the population is agrarian.[3]

Table 1 provides some selected socio-economic indicators for the country.[4,5,6]

Table 1: Socio-economic Indicators: Togo

Indicator	
Population (2006 est.)	5.5 million
Growth rate (2006 est.)	2.72%
GNP (US dollars) (2004 est.)	$8.684 billion
GNP per capita (US dollars)	$352
Human Development Index	147 (out of 177 countries)

Education System

Togo operates on a system of six years of primary, four years of junior secondary, three years of senior secondary, and two to four years of tertiary education. There are two

ministries responsible for the administration and management of education in the country: the National Ministry for Education and Research (MENR) and the Ministry for Vocational and Professional Training (METFP).

Six designated regional headquarters, each with defined district education structures, oversee the routine and local management of the education system and treat all issues related to research, school inspections, teaching and training.

Table 2 provides a quantitative perspective of some selected system indicators.[7]

Table 2: Selected Education Data

School Enrolment	2000	2004
Primary completion rate, total (% of relevant age group)	61.0	66.3
School enrolment, primary (% gross)*	103.7	101.1
School enrolment, secondary (% gross)*	30.4	38.9
School enrollment, tertiary (% gross)*	3.1	
Ratio of girls to boys in primary and secondary education (%)**	68.8	72.7
Literacy rate, adult total (% of people ages 15 and above)		53.2

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**Ratio of girls to boys is the percentage of girls to boys enrolled at primary and secondary levels in public and private schools.

Despite the regional and district structures implemented to help decentralise the management of education, the system still suffers from a heavy centralised management control.[8]

Some ministries also organise specific vocational and professional training for their future employees. For example, the Ministry of Health organises training for medical auxiliaries, the Ministry of Youth and Sports for physical training instructors, the Civil Service for administrators and officers of the customs and revenue services, and the Ministry of Rural Development for agricultural extension officers.

With the exception of the training and educational programmes organised by the Civil Service which may involve university graduates, the rest are pre-university academic or professional programmes which include in-service training.

Some NGOs are also involved in literacy and professional training activities. The Council for Higher Education and Training (CSEF) is in charge of all such programmes that do not fall under the two main educational ministries. Nonetheless, each ministry organises its own training programmes.

The education sector is allocated 21% of the country's budgetary resources. The two

public universities of Lome and Kara receive subvention from government that caters for 96% of their resources.

Between 1990 and 2002, the gap between boys' and girls' school enrolment dropped by 30%; however, the quality of teaching deteriorated as the number of qualified teachers fell drastically, as Table 3 below reveals.

Table 3: Teacher Qualifications

Year	Qualified Teachers (%)		Non-qualified teachers (%)	
	Teachers	Assistants	Trainees	Monitors
1990	28.7	47.6		23.7
2002	16.8	16.1	55.3	11.8

Educational television was an effective tool that helped the government to train and run refresher courses for thousands of teachers. However, television was curtailed in the 1990s due to the socio-political situation which led to the suspension of international co-operation and donor intervention in the sector. Currently, community FM radios transmit programmes that have an impact on public order and human rights, health and political education, gender sensitisation and equality.[9]

ICT Policies

Togo has no ICT policy.

The 1975 education reforms focused on education as it relates to the people and family life. The government revised the policy because of its limited expression and impact on intellectual and general development.

The 2003 revised policy emphasises the following priority actions in the education sector:

- Use of competence as the yardstick for reviewing teaching and training programmes
- Adoption of educational policies that take into account ongoing innovations in education, notably:
    - Initiation of students into ICT culture, productive work, and revenue-generating activities
    - Civic and moral education
    - Road safety
    - Health reproduction, STDs, and HIV/AIDS
    - Human rights education and peace
    - Education and the environment

These actions indicate a cautious admission of the need and prime concern of the government to integrate ICT into the curriculum. Meanwhile the country's budgetary constraints have crippled government initiative in the sector. Thus, the proposed actions do not delineate concrete perspectives for implementation approaches.

Notwithstanding this challenge, the private sector has carried the torch of Internet communication to most cities in Togo. A typical example is the computer services and sales company, CIB-INTA, which has sales outlets and cyber cafés in major cities in all six regions of the country.

Infrastructure

Telephone

The telephone infrastructure extends from Lome, the capital city in the south, to Dapaong, the northernmost city in Togo. The main operator, Togo Telecom, operates cellular services in addition to the fixed-line service, which is among the best in West Africa.[10]

There are two cellular operators in Togo (Togo Cellulaire of Togo Telecom and Moov, formerly Telecel)[11] and three major ISPs. Mobile telephone services cover most of the urban and semi-urban areas.[12,13] Telephone density is about 9%, inclusive of mobile phones.

Table 4 provides a snapshop of Togo's telecommunications infrastructure implementation and usage statistics.

Table 4: Telecommunications in Togo

Type of Telecommunications	
Telephones – main lines in use	58,600 (2005)
Telephones – mobile cellular	443,600 (2005)
Radio broadcast stations	AM 2, FM 9, shortwave 4 (1998)
Television broadcast stations	3 (plus 2 repeaters) (1997)
Internet hosts	520 (2006)
Internet users	300,000 (2005)

Electrification

Togo has an installed capacity of 42 MW of electricity on a 5,640 kilometre electrification network with 872 distribution sites that provide power to 4,200 public installations (street lights, etc.) and cover 13% of the national territory.

The availability of electric power is negligible in the rural areas, with only 2% of the population having access.[14] The country's energy problems may be traced to its lack of hydro and financial resources, not excluding the mismanagement of its electric power company, Compagnie Electrique du Togo (CET).[15]

Ghana provides Togo with 380GW/h, but this volume has plummeted recently owing to the challenges Ghana is currently facing with the low level of water in its hydro-electric dam at Akosombo – a recurring phenomenon every few years.[16] Togo also receives some

electricity from the Nangbeto Dam, which is on the border with Benin and is shared by the two countries.[17] Further, Togo, Benin, and Nigeria have signed an agreement for the supply of electricity from Nigeria to both countries.

The Economic Community of West African States (ECOWAS), with private sector participation, has nearly completed the West Africa Gas Pipeline (WAGP) through Benin and Togo. WAGP is part of the region's energy supply system and is to supply natural gas to the three countries.[18] ECOWAS, through its West Africa Power Pool Project (WAPP), is also in the process of constructing an interconnecting electric power grid for the region that will transport power from countries with excess supply to those with low-energy levels.[19]

Current ICT Initiatives and Projects

Primary-level initiatives

An NGO, Mosaique du Monde, donated five computers to a public primary school, École Publique Primaire Bohn. That facility has been used to train about 98 teachers including 15 school inspectors and pupils. This initiative, though recognised by the government, receives only FCFA5,000 (approximately USD$10) as a contribution towards payment of monthly Internet connection fees. The Internet café has a dysfunctional air-conditioning system. Presently the facility has no Internet connection.

Mosaique du Monde provided courses on CDs covering several subject areas that the pupils use as study material. The facility, in Lome, is the only one of its kind in a public school. The NGO has plans to establish another similar facility in Kara.

Some private elementary schools (e.g., École Française and the American School of Lome) have computer laboratories, but the school fee is not within the reach of the average Togolese family. Public schools charge FCFA7,000 (USD$14) per annum, but the lowest private school fees are in excess of USD$1400.

Secondary-level initiatives

Public secondary schools in Lome suffer from the same problems as the elementary schools. Some private secondary schools have computer laboratories for their students, especially those schools that operate the French system of education and sit the external French examinations (e.g., École Alpha and École La Lumière), but only about 5% of Togolese youth know how to use computers.[20]

Tertiary-level initiatives

Campus Numérique Francophonie de Lome is an initiative of the Agence Universitaire de La Francophonie (AUF). It was created in 1996 for use by the four tertiary institutions in Lome including Université de Lome.[21]

The centre boasts 50 computers and a high-speed Internet service. AUF pays for Internet connectivity charges, and students are provided an access code at a subscription rate of FCFA2,000 per month (approximately USD$4).

The facility provides opportunity to students to pursue academic programmes via e-learning with universities in the francophone world. Student applications are vetted for listed programmes and, when successful, students receive scholarships that permit them to pay about 10% to 15% of the course fee. Students are not restricted to the on-campus facility and may use their own Internet connection to pursue their programmes.[22]

Resafad-Togo, the Réseau Africain de Formation à Distance, closed its doors two years ago. The project, which employed ICT, was located on the Université de Lome campus and saw the training of several head teachers of primary schools nationwide. The trained teachers were to pass on the skills acquired to teachers under their supervision.[23]

The Computer Centre (Centre de Calcul) and the Distance Learning Centre (Centre pour la formation à Distance) of the Université de Lome are developing educational programmes to be launched using ICT.[24]

Implementing ICT in Education: What Helps and What Hinders?

Table 5 below lists the core factors of the enabling, constraining, and risk factors in various sectors. [26, 27]

Table 5: Factors Influencing ICT Adoption

Sectors	Enabling Factors	Constraining and Risk Factors
ICT deployment	High-speed Internet connection because of recent connection to SAT3. Private-sector involvement in deployment of Internet services and facilities aiding access to ICT in the general population, especially in urban areas.	*Constraints:* Universities financially constrained from extending the facilities on campuses. Private sector ISPs emphasise commercial service against community service. Low levels of ICT literacy in the general and teaching population *Risks:* Possibility of failure of government or universities to renew or maintain installed facilities. Inability of government to extend ICT infrastructure due to financial and budgetary constraints.
Non-formal education	Community school enrolment accounts for 9% of all primary and secondary school enrolment since 1999 and continues to increase. NGOs create literacy and vocational programmes specifically for girls and school dropouts	*Constraints:* Government budgets are insufficient and do not permit meaningful assistance to initiatives. *Risks:* Possibility of the parent/teacher associations in the communities and the NGOs not

		maintaining standards set by the ministries.
Gender balance	The ratio of girls to boys is gradually converging at the lower educational levels.	*Constraints:* Traditional daily household demands still take priority over girls' education. *Risks:* No priority policy for girls; meanwhile girls make up only 20% of the tertiary-level population.
Vocational and professional education	NGOs create vocational centres specifically for girls and school dropouts.	*Constraints:* Government unable to build more schools as required due to budgetary constraints. *Risks:* Suspension of international co-operation due to Togo's political unrest may continue to plague the economy.
ICT policy and implementation	The university and some institutions establish computer laboratories with scarce resources.	*Constraints:* The absence of policy impedes implementation of ICT in the education sector. *Risks:* The suspension of international co-operation and the withdrawal of assistance affect ICT development in the education and other vital sectors.

Notes

1. The World Factbook 2007. www.cia.gov/cia/publications/factbook/geos/to.html
2. Geography of Togo. Wikipedia. http://en.wikipedia.org/wiki/Geography_of_Togo
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ICT in Education in Tunisia

by Amr Hamdy
June 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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Overview

Tunisia has committed to the institutionalisation of ICT in all aspects of the economy and has played a leading role on the global level by hosting the second phase of the world summit on the information system. To introduce and sustain the integration of ICT in education, Tunisia has implemented a multi-dimensional strategy based on modernising its infrastructure. Education is an important sector affected by this policy where a major restructuring took place and reforms have taken into consideration the integration of ICT. Training and professional development of teachers and administrators were also considered as keys to successfully implementing ICT at all stages of the teaching-learning process. Distance education opens new horizons and constitutes a rich field of research, innovation, and creation that still needs to be reinforced and further developed.

Country Profile

Tunisia is considered to be one of the most liberal nations in the Islamic world, especially in terms of the rights accorded to women. The country has been influenced throughout its history by waves of immigrants – primarily Phoenician, Arab, Berber, African, Turkish, and European – giving rise to a unique culture.

Tunisia is a republic with a strong presidential system dominated by a single political party. The country has a diverse economy with important agricultural, mining, energy, tourism, petroleum, and manufacturing sectors. Governmental control of economic affairs, while still heavy, has gradually relaxed over the past decade with increasing privatisation, simplification of the tax structure, and a prudent approach to debt.

Table 1 provides some selected socio-economic indicators for the country.[1]

Table 1: Socio-economic Indicators: Tunisia

Indicator	
Nationality	Tunisian
Ethnic groups	Arab 98%; European 1%; Jewish and other 1%
Religions	Muslim 98%; Christian 1%; Jewish and other 1%
Languages	Arabic (official and one of the languages of commerce), French (commerce)
Population	10,175,014 (July 2006 est.)
Population growth rate	0.99% (2006 est.)
Literacy	Male: 83.4% Female: 65.3% Total population: 74.3% (2004 est.)
GDP (US dollars)	$32.95 billion (2006 est.)
GDP (US dollars)	$8,600 (2006 est.)
Labour force	3.502 million
Unemployment rate	13.9% (2006 est.)
Telephones - main lines in use	1.258 million (2005)

Telephones - mobile cellular	5.681 million (2005)
Radio broadcast stations	AM 7; FM 20; shortwave 2 (1998)
Television broadcast stations	26 (plus 76 repeaters) (1995)
Internet users	953,800 (2005)

The Education System

Since the country gained independence in 1956, Tunisian education officials have been working on an education system that responds to the needs of a rapidly developing country and aspires to be in the vanguard of technological change. In fact, education ranks number one in the priorities of the country, and more than 20% of the Tunisian government's annual budget is directed to education. Education is delivered both in public and private institutions. It is organised as described below.

Pre-school education
Pre-school is oriented towards children aged three to six. It aims at preparing children for school, building their capacities for self-expression, stimulating their creativity and facilitating their integration into their social environment. There are both municipal and private kindergartens.

Basic Education
Basic education (BE) is compulsory. It is divided into two distinct stages: six years of primary education (also referred to as first cycle of BE) and three years of preparatory education (or second cycle of BE). Students are awarded the Diplôme de Fin d'Etudes de l'Enseignement de Base.

Secondary education
Secondary education lasts for four years and is aimed at preparing students for university-level studies or entry into the workforce. It is divided into two stages: one year of general education plus one year of pre-orientation, and two years of specialised education. It culminates in the Baccalaureate Diploma, a passport to higher education.[2]

Table 2 provides data for basic and secondary education levels[3]

Table 2: Basic and Secondary Education Statistics

Year	2004/2005	2005/2006
Number of students of first cycle of basic education (public)	1.17 million	1.12 million
Number of secondary education students (public)	508,790	503,531
Number of secondary education teachers (public)	29,341	--
Number of secondary education institutions (public)	428	417
Average number of secondary education students per class (public)	31.6	30.1
Number of students of second cycle basic education and secondary education (private)	51,779	58,660

Number of teachers of second cycle basic education and secondary education (private)	8,371	9,130
Number of institutions of second cycle basic education and secondary education (private)	268	281

Higher education
Higher education is mainly provided by universities and the numerous higher institutes and schools. Institutions of higher education come under the responsibility of the Ministry of Higher Education, the Ministry of Scientific Research, Technology and Development of Competencies, or the ministry most appropriate to their specialty.

In 2005-06, there were 178 public institutions of higher education including 13 universities; 24 higher institutes of technological studies, and six higher institutes of teacher training. The remaining institutions are subject-specific and operate under the aegis of one of the country's universities. The Ministry of Higher Education supervises 155 institutions, and 23 are under the co-supervision of this ministry and other ministries. In addition, the Ministry of Higher Education recognises 20 university-level private institutions. The number of enrolled students is constantly rising: in 2004-05 there were 326,734. In 2005-06 there were 346,000.

In parallel with the growing number of students and institutions, reforms are being adopted to meet new challenges. For example, a degree structure based on the new European three-tier model of bachelor's, master's, and doctoral degrees was started in the 2006-07 academic year. This reform is known as the L.M.D: licence (three years), mastère (two years), doctorat (five years). The new academic credit-hour system is meant to give students greater flexibility in designing their study tracks, while allowing them to earn and transfer credits between institutions both domestically and internationally.[4]

Non-university level post-secondary studies (technical/vocational)
Higher technical education is mainly offered in higher institutes of technological studies where studies last for two-and-a-half years. Studies come under the responsibility of the relevant ministries. A vocational/technical diploma is awarded at the end of the course.

Continuous/ongoing training
Tunisia has regional centres of education and continuous training for teachers of primary and secondary school. There are also centres of education and trainer training that provide training for school inspectors, pedagogical counsellors and teacher trainers. The Higher Institute of Education and Continuous Training offers graduate and post-graduate courses for all education stakeholders who seek further education and degrees.

ICT Policies

The government policy towards the integration of ICT in the Tunisian education system is clearly stated in the 2002-2007 policy, Reconstruction of the Tunisian Educational System, where the mastery of ICT is emphasised as necessary to support

professional, innovative, and creative teachers. The policy is defined in operational terms through the Educational Act[5] issued on July 23, 2002, which states that it is the responsibility of the Ministry of Education and Training and the Ministry of Higher Education to implement the policies related to education, while the president usually decides on the strategic issues. Each minister presents his programmes concerning his ministry to the president who studies them and either agrees or disagrees with the minister concerned. Each ministry has its own budget to equip the institutions under its responsibility, to train its staff and to pay its employees.

The policy also emphasises the importance of ICT represented in equipping schools, introducing ICT as a subject and providing teacher training. Article 2 states that programmes should take into account the training of learners in the use of ICT as a tool to acquire knowledge and self-training. This is reflected in the notion of:

- Training rather than teaching, an approach that reflects an alteration in the teacher's role (i.e., the teacher is no longer the only source of information.)
- Computer science as one of the subjects studied in primary schools and as a compulsory subject in the seventh form (first form of second cycle of Basic Education) with a frequency of one session per week

Both the Tunisian Virtual School and the Virtual University of Tunis were launched as government initiatives, reflecting the high degree of interest of political officials in integrating ICT in the education system. The creation of these virtual institutions was mandated in both the policy and the Education Act.[6]

Infrastructure

To meet the challenges of technology mastery and the integration of ICT in all education sectors, Tunisia has implemented a multi-dimensional strategy that focuses on:

- Modernising its infrastructure
- Establishing a favourable legal framework to facilitate the equipment of all institutions
- Restructuring its education system taking into account the requirement that all students acquire ICT skills (e.g., teaching computing from basic education and embedding ICT into the curriculum)

To achieve their objectives, both ministries launched a comprehensive ICT-oriented training programme, delivered through both conventional and distance learning methods that targets all education stakeholders and includes the development of networks to disseminate best practices and encourage a digital culture.[7]

Computers, smart boards, video projectors, and digital cameras are some of the technology tools used to expand the scope, scale, and quality of learning.

Table 3 provides some figures and statistics about ICT infrastructure, connection to the Internet, and distance education.[8]

Table 3: The Evolution of ICT Infrastructure

Year	Infrastructure
1984	• Creation of the INBMI (public Internet service provider + maintenance + training)
1985	• Beginning of generalising the use of computing in educational institutions
1988	• "Internet for All" project
1990	• 100 secondary schools equipped with computer labs • Office automation training programme for teachers
1998	• Connection of 30% of the institutions • 1,000 teachers had free Internet and e-mail accounts
2000	• 100% of secondary schools connected to Internet
2001	• The president ordered the connection of all educational institutions to Internet and the introduction of ICT in education • All high schools and research centres connected to the Internet
2002	• Launching of the Tunisian Virtual School
2003	• The Virtual University of Tunis established as a government initiative
2006-07	• All primary schools connected to the Internet • 20% of courses offered through e-learning

The process of equipping secondary schools with new computing spaces is ongoing in order to teach computing and increase capacity for the integration of ICT in education. In 2004, there were 22,000 computer (0.28 computers for every class), but by 2006 there were 57,000 computers (0.71 computers for every class).[9]

It is foreseen that the number of educational Web sites by the year 2009 will increase to 4000 (from 1,300 in 2006). As well, the number of trained teachers will increase to 80,000 (from 60,000 in 2006).

All higher education universities and institutes are connected to the Internet by the El Khawarizmi Calculus Center, which is the official public Internet service provider (ISP) to higher education institutes. It also provides Web hosting, e-mail accounts, and various computing-related services, and it contributes to the access to innovative technologies.[10] (The INBMI, or l'Institut National de Bureautique et de Micro-Informatique, is the official public ISP to the Ministry of Education and Training and its all public educational institutions.)

Research in the domain of ICTs is enhanced through the research laboratory called Culture, New Technologies and Development, which is directed by the prominent Professor Mohamed Zinelabidine.[11]

The integration of ICT in education is reinforced through the Tunisian Virtual School

and the Virtual University of Tunis.

Tunisian Virtual School (TVS)
TVS has been designed and created within the INBMI and is an essential basis of the "School of Tomorrow." It is an example of pioneer experiences in North Africa and in the Arab countries. Tunisia was one of the first countries to contribute to the new technological changes in the field of distance education and e-learning through the launching of TVS in an experimental phase on January 28, 2002. As clearly stated in the presidential election programme, all the components of the TVU will be completed before the end of 2009. It is targeted both at the learner and the educator in basic and secondary education. It provides free interactive courses, revision modules, assistance, and ICT training, but it doesn't award certificates yet. It consolidates the orientation of the educational system towards the development of the quality of education and the equality of chances, where it reinforces conventional education. It also provides a space for collaboration, resource sharing, networking, and publishing for the benefit of teachers.[12]

Virtual University of Tunis
The Virtual University of Tunis was established as a government initiative in 2003, and it now provides 20% of courses through e-learning. The initial objective was to offer distance learning programmes and widen participation in Tunisia, but it has increasingly become an on-line higher education provider across the French-speaking regions of North Africa. It doesn't cover all specialties, but it awards diplomas and certificates. It provides interactive tutored courses, training, and development of content. There are 207 modules, representing more than 8,000 hours, that are ready for use. There are another 56 modules in progress and 110 in the evaluation phase. Another 51 are to be added within the framework of the co-operation and the partnership with Sun and Nettuno.[13] The Virtual University currently has 10 functional access centres, and by 2009 there will be 200.

Current ICT Initiatives and Projects

E-learning, tele-formation, and distance education in general remain very promising areas of research that need to be reinforced and developed – hence, the efforts deployed within the Virtual University of Tunis to increase the number of its access centres.

Tunisia is supported by some international organisations (e.g., the World Bank, Microsoft, Apple) in its major activities which include implementing ICT staff training programmes; supporting professional development; providing networking opportunities; researching, developing, and evaluating new policy approaches; and bolstering institutional ICT infrastructure.

The World Bank is involved in a project known as Excellence Schools, which are usually found in relatively under-privileged areas. The first phase of the project seeks to promote excellence in teaching and learning, while continuing the push for the inclusion of all children at all levels of the basic education system. The second phase is to support the government's efforts to provide a greater number of students with opportunities for post-basic education and modernise the sector in ways that improve the quality of outputs and the efficiency with which they are produced.

Apple Europe supports a project to set up the integration of ICTs in education with the co-operation of Apple Europe Institute. The project consists of establishing two spaces, the first one within the INBMI, and aims to support the mastery of the new technologies and equipment that will be made available. The second space is in one Preparatory School in Beja. It is allocated for the production of digital contents and educational software by students with their teachers' help and guidance.

Table 4 summarises the current and recent ICT initiatives and projects in Tunisia.

Table 4: ICT Initiatives and Projects

Programme	Description
Administration	
Remote registration	▪ The Web site offers the possibility of on-line registration for students in 166 public higher education institutions. Registration fees can be paid online via e-dinar.
e-Learning	
e-learning	▪ Virtual university: Project implemented since 2003; 20% of the courses will be given virtually by the year 2006 ▪ Virtual school: experiment since 2002; it is being gradually generalised ▪ Virtual school of the Tunisian Post: providing continued training for the Post staff (www.postelearning.poste.tn)
Virtual library	▪ Establishment of a virtual library for the communication technologies sector (www.emaktaba.tn). The books and documents contained in the library are being scanned and digitised. ▪ Training and dissemination of digital culture
Capacity-building	
Basic training	▪ Establishment of five higher education institutions for the training of ICTs specialists in 14 areas of specialisation during the period 2002-2005 ▪ Establishment of 11 areas of specialisation for the training of ICT specialists in higher education institutions in this field during the period 2002-2004 ▪ Establishment of a higher education cycle for the training of specialists in computer security, and complementary training cycles in ENSI and three private universities.
Training as part of the education syllabus	▪ Testing the virtual university in 18 ISETs (higher institutes of technological studies), as well as the virtual school which offers students virtual courses ▪ Pursuing the generalisation of education in the field of computer science in the two final years of secondary education ▪ Pursuing the integration of information technologies in

	basic education programmes at the level of the technological education subject
Training and Development	
Continued training	▪ Open school for civil servants: remote continued training via Internet allowing civil servants in office to prepare and participate in competitions for access to high education institutions
Complementary training	▪ The training programme (21-21) consists upgrading job-seeking university graduates in the fields of computer science, multimedia, and new communication technologies ▪ Training of trainers in the fields of free software, Web techniques, and technological communications
Infrastructure	
One Computer Per Class initiative	▪ More computer-equipped spaces being implemented in primary and preparatory schools to reach the percentage determined by the presidential election programme, which is one computer per class by 2009
Mobile laboratories	▪ An innovative project known as Mobile Laboratories or Mobile Internet Buses connected to the Internet via satellites targets schools in rural remote regions to bring them technology and reduce the digital divide
Collaborative Learning Programmes	
Global Teenager Project (GTP)P	▪ Launched in 1999 to bring the full potential of ICTs into the classroom and enhance secondary pupils' learning skills while increasing their understanding of other cultures by staging lively, global classroom debates in cyberspace
Web presence	
	▪ Most educational institutions have Web sites and communicate official information using e-mail. Intranet is used but not well-developed in every institution.

Implementing ICT in Education: What Helps and What Hinders?

Although there are great efforts already made to implement ICT, but, there are still many challenges to face.

Table 5 provides a summary of the factors influencing ICT adoption.

Table 5: Factors Influencing ICT Adoption

Logistics and Implementation
▪ While there are computing labs to teach computer sciences and technology in all institutions, specialised integration labs are not available everywhere. It is therefore difficult to perform any integrated lessons. The integrated lab is designed to raise students (and teachers) from a concrete level to a formal level of thinking. It uses laboratory work from physical science fields as well as math, all with the goal of raising the student to the level of ability to understand serious college work.

- Teachers are often reluctant to embrace ICT because they are already overloaded with very busy timetables and large classes. More equipment is needed and more timetable organisation and alleviation is required to enable real ICT implementation.
- It is apparent that more time is needed and more incentives are required to change the mentality and the attitude of education stakeholders to adhere to the changes brought by new technologies and to fully engage in innovative and creative new approaches.

Support

- One of the biggest hindrances is the shortage of follow-up in terms of technical maintenance, training, assistance, and dissemination of best practices, which results in the lack of efficiency and consistency of ICT integration. This is generally due to the limited number of competent ICT trainers in spite of regular national and regional ICT training seminars and workshops. Compared with the total number of teachers, those who sometimes manage to integrate ICT in their classes are few and those who really master the tools and use integration properly are even fewer.

Gender/Urban

- Constraints relating to gender are not really apparent since the number of female students sometimes exceeds the number of male students as reflected in the following chart:

- Despite the attempts to reach students in rural areas and to involve them in the technological revolution, the gap is still wide and more decisions need to be taken regarding ICT infrastructure, Internet connection, and rehabilitation of human resources.[14]

Notes

[1] The World Factbook 2007.. https://cia.gov/cia//publications/factbook/geos/ts.html

[3] Official Portal of the Ministry of Education and Training. www.edunet.tn

[5] Education Act.2002. Edunet. http://www.edunet.tn/ressources/reforme/orientationan.pdf
[6] Information and Communication technologies in Tunisia-Main Achivements. Ministry of Communication Technologies. http://www.infocom.tn/index.php?id=199

[7] Selected ICT Priority Issues
http://www.libc.net/CMS/uploadedfiles/Publications/ICTPrty_2002.pdf

[8] The National Institute of Bureautics and Computing. www.inbmi.edunet.tn

[9] *World Education News & Reviews.* www.wes.org/ewenr

[10] El Khawarizmi Calculus Center. www.cck.rnu.tn

[11] he Virtual University of Tunis.. http://www.obhe.ac.uk

[12] The Tunisian Virtual School. www.evt.edunet.tn

[13] The Virtual University of Tunis. www.uvt.rnu.tn

[14] Global Challenges of eDevelopment. http://www.uta.fi/jour/global/hietanen2.pdf

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ICT in Education in Uganda

by Glen Farrell
June 2007

Source: *World Fact Book*[1]

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Overview

As it adopts ICT in education, Uganda faces the same challenges as most developing economies – poorly developed ICT infrastructure, high bandwidth costs, an unreliable supply of electricity, and a general lack of resources to meet a broad spectrum of needs. However, with the rapid emergence of wireless network capacity and the ubiquitous growth of mobile phones, the context of the infrastructure is changing. A national ICT policy is in place and an education sector ICT policy is before Cabinet. The Ministry of Education and Sports is taking steps to co-ordinate ICT development and has allocated resources to support implementation of its ICT strategy.

Country Profile

While Uganda has had significant economic growth over the last decade, with a concomitant reduction of poverty, it remains one of the poorest countries in the world. It is, nevertheless, on track to meet the Millennium Development Goal (MDG) of universal primary education and, according to the 2006 National Report,[2] is committed to achieving the MDGs of universal completion of secondary schooling by 2015 and elimination of gender disparity in both primary and post-primary levels.
Table 1 provides some selected socio-economic indicators for the country.[3,4,5]

Table 1: Selected Country Data

Indicator	
Population	27.8 million
Languages	English (official national language), Ganda or Luganda (most widely used of the Niger-Congo languages and may be taught in school), other Niger-Congo languages, Nilo-Saharan languages, Swahili, Arabic
Adult literacy rate	73.6 % (2004)
2005 economic activity (% of GDP)	Agriculture: 33.5% Industry: 20.9% Services: 45.6%
Human Development Index	145 (out of 177 countries)
Human Poverty Index	62 (out of 102 countries)
Per capita gross national income (US dollars)	$280 (2005)

The Education System

The Uganda system is based on an initial seven years of primary education. Students who successfully complete primary schooling have the option of enrolling in four years of lower secondary or taking a three-year craft course in a technical school. Those who successfully complete the lower secondary level may then choose to enroll in the two-year upper secondary programme after which they may progress to university studies or a technical/vocational programme.

Universal primary education was introduced in Uganda in 1997,[6] resulting in a near doubling of enrolments over the next year and creating a need for more schools, more teachers, more learning materials, and curriculum reforms.[7] A commitment to introduce universal free secondary education was made during the last election in 2006. This has since been expanded to include universal post-primary education and training. An implementation plan is being prepared.

Tertiary education includes 20 universities (four public), five colleges of commerce, five technical colleges, 10 teachers' colleges, and several specialised training insititutes.[8] The tertiary sub-sector is growing very rapidly and, according to the National Council for Higher Education,[9] it is neither integrated nor diversified, and it lacks a credit system to ease student mobility among disciplines and institutions. A strategic plan to address most of these issues is in the pipeline.

The statistical data in Table 2 provides a quantitative picture of education in Uganda.

Table 2: Selected Education Data

Indicator	
Primary enrolment (% gross)*	134 (2003); 125 (2004); 118 (2005)
Secondary enrolment (% gross)*	19 (2003); 19 (2004); 16 (2005)
Primary completion rates (% of 6- to 12-year age group)	22.4 (2003); 37.4 (2004)
Tertiary enrolment	2.8 % gross (2004)
Ratio of girls to boys in primary and secondary (%)**	96 (2003); 100.1 (2004)
Trained teachers (primary)	80 %

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**Ratio of girls to boys is the percentage of girls to boys enrolled at primary and secondary levels in public and private schools.

ICT Policies

National

Uganda developed its initial ICT national policy in 2003. The policy framework document[10] recognised that Uganda would need to embrace the goal of "lifelong education for all." Objective 2 of the policy addresses literacy improvement and human resource capacity-building with strategies that include:

- Integrating ICT into mainstream educational curricula as well as other literacy programmes to provide for equitable access for all students regardless of level
- Developing and managing ICT centres of excellence to provide basic and advanced ICT training
- Setting up mechanisms that promote collaboration between industry and training institutions to build appropriate human resources capacity
- Promoting the twinning of training institutions in Uganda with those elsewhere to enhance skills transfer

A subsequent e-readiness assessment in 2004 revealed that a focused and co-ordinated approach to implementation was required. This led to the establishment of an ICT Working Group that tabled a number of recommendations.[11] One of the recommendations executed early in 2006 was the establishment of a Ministry of ICT to address the convergence of ICT and to provide co-ordination of policy development. The mandate of the ministry is to:

- Oversee and harmonise operations of its affiliated agencies: the Uganda Communications Commission, the National Information Technology Authority, the Broadcasting Council, and the proposed Information Management Commission
- Collaborate with the National Planning Authority to spearhead activities for developing sectoral ICT plans for integration into the National Development Plan
- Oversee periodic policy reviews for the telecommunications sub-sector for both mobile and fixed-line telephony, postal, Internet, and e-mail services
- Oversee and guide the implementation of the Uganda e-Government Strategy Framework by various government ministries and agencies
- Develop and implement a prudent monitoring and evaluation system for the ICT sector

Education Sector

Another recommendation from the Working Group was that an ICT policy for schools be developed. This, together with the evolution of the national policy, has provided impetus for the Ministry of Education to expand its focus on the use of ICT.

While the national policy focuses on the importance of developing the ICT competencies of learners, the interpretation by the ministry appears to be moving toward a more integrated vision. Evidence for this comes from the 2005-2006 sector review[7] in which the following initiatives were reported:

- Guidelines on the use of ICTs were developed.

- An agreement with Microsoft has been signed to subsidise software licenses and training of teachers. In addition, the Microsoft Partners in Learning Program has endorsed a number of activities for implementation.
- An ICT budget for all secondary schools is now required.
- Subsidised rates from ICT service providers have been negotiated.
- Training teachers in ICT skills has begun.
- Ordinary level curriculum on ICT was operational and is examinable by the Examinations Board.
- Operational funds to support ICT in some schools have been provided.
- Some ICT infrastructure has been provided to schools.

The review also identifies the following actions as necessary if the goal of transforming Uganda from a mere "information society" to one that is knowledge-based is to be realised:

- Update the legal and security measures for the effective use of ICT in education. In addition, security management is required to ensure that access to confidential data is controlled and authorised.
- Address the language, socio-economic, disability, and cultural barriers to accessing ICT.
- Adopt cost-reducing measures to counter the high cost of ICT equipment, installation, and maintenance, paving the way for more equitable access.
- Revise the curricula.
- Produce more ICT-literate teachers.
- Streamline operations of the different ICT providers in order to avoid duplication and conflict of interest, and to secure everyone's co-operation.
- Provide the requisite ICT infrastructure to the poor rural schools during the first phase of implementation.
- Define the minimum technical specifications of the ICT equipment.
- Routinely update a record of the existing ICT initiatives to avoid duplication.

The ministry also developed a draft sector policy on ICT in education that is currently being considered by Cabinet.[12] The draft policy is intended to:

- Apply to all education sub-sectors, including non formal education
- Focus on the development of ICT competencies as well as using ICT to teach across the curriculum
- Include strategies for the development of digital learning content
- Develop teachers' ICT competencies
- Foster research in the educational applications of ICT

An implementation and budget plan, procurement and connectivity strategies, and a policy management structure are also included in the policy. Funding will come from a variety of sources including the national education budget, the donor community, and the private sector.

Infrastructure

National

Liberalisation of the telecommunication sector in 1997 resulted in significant growth in infrastructure and access, but this occurred primarily in the urban areas. An analysis of the telecommunications sector undertaken in 2004[13] concluded the following:

- In terms of the general population, there was almost no access to computers or the Internet outside the major urban centres.
- Access to electricity was a serious constraint to ICT use because 97.7% of rural and 59.9% of urban households had no access.
- Mobile voice telephony was the exclusive means of communication for the typical Ugandan citizen and there were hardly any fixed line services in people's homes.
- The spread of mobile phones coincided with an increase in the number of private FM radio stations that has enabled a synergy between the two technologies. The stations provide near total national coverage in local languages with programmes ranging from political debates to health issues, agriculture, education, gender issues, and the environment. Listeners participate by calling the station with comments and questions.

The study also noted that in 2003 Uganda had created the Rural Communication Development Fund[14] to facilitate implementation of the country's policy of universal access to communication technologies. The Fund aims to encourage development of infrastructure in rural areas by offering subsidies and grants to investors in the following areas:

- Internet access points in all districts in the country – all districts will be covered by 2006
- Universal access to telephony – access target changed from one public access point per 5,000 inhabitants to one per 2,500 inhabitants
- Multipurpose community telecentres – 20 telecentres in 20 districts by 2007
- ICT training centres and Internet cafés – the target is to cover all the districts of Uganda by June 2006
- District information portals to provide information about health, agriculture, education, commerce, etc. – district Web sites are now active and can be accessed
- Public pay phones – installation of public pay phones in 316 selected sub-counties across the country has been achieved since 2004

Table 3 provides further information about national usage of ICT in Uganda[15] for the years 2000, 2004, and 2006 where available.

Table 3: ICT in Uganda

ICT	

Telephone main lines (per 1,000 people)	3 (2000) 3 (2004)
Mobile subscribers (per 1,000 people)	16 (2000) 45 (2004)
Population covered by mobile telephony (%)	16 (2000) 70 (2004)
Internet users (per 1,000 people)	2 (2000) 6 (2004) 18 (2006)[16]
Personal computers (per 1,000 people)	3 (2000) 5 (2004)
Households with television	5 (2000) 6 (2004)
VSAT providers	8 (2006)
Mobile cellular operators	3 (2006)
Private FM stations	145
Private TV stations	34

Schools

According to a report based on 2003 data,[17] Uganda had only 106 of its 13,353 primary and 2,070 secondary schools connected to the Internet. Uconnect and SchoolNet Uganda, two major NGOs involved in ICTs for schools, led these projects. Connectivity is much more prevalent in urban than rural schools, basically because access to ICT infrastructure for schools mirrors the national rural-urban divide. The more specific factors constraining connectivity in rural areas are the overall poor communications infrastructure, low electricity coverage, and high capital costs involved in setting up a computer laboratory. No doubt this has changed since 2003, and will continue to change, as access to electricity and connectivity improves.

Although many schools have computers as a result of initiatives with NGOs, religious organisations, and international donors, few are connected to the Internet. Those that are in place are typically used for teaching basic computer skills and administrative purposes.

The Ministry of Education and Sports has become much more proactive over the last two years as a result of the recent policy emphasis on ICT. For example, in its Review for 2005-2006, the ministry listed the following achievements:

- Over 300 teachers have been trained.
- Three generators and 300 computers have been provided to NEPAD e-schools.
- Software and upgrades for 6,000 desktop computers already in schools have been procured.
- Preferential rate agreements with Uganda Telecom for voice and data connectivity have been secured.
- Work has started on introducing ICT into the teaching and learning process in primary and secondary schools.

Computers are typically set up in a one-room lab with 10 to 20 machines. A television receiver with a VCR may also be included depending on reception capability. Classes generally have scheduled use of the lab two or three times per week. Overcrowding is common because of large class sizes.

Tertiary education

The tertiary education sector is not particularly integrated at this point and consequently there are no overarching ICT policies or implementation programmes. Typically, initiatives are taken on an individual institution basis with the ministry and/or with other partners.

However, in terms of the adoption of ICT, the ministry's 2005-2006 Annual Review[7] reports an increase in ICT accessibility among tertiary institutions:

- E-mail addresses increased from 79 in 2004 to 97 in 2005.
- Institutions with Web sites increased from 34 in 2004 to 42 in 2005.
- The computer-student ratio in Makerere University has improved to 1:15 on average.
- Mbarara University for Science and Technology upgraded its connectivity bandwidth to enable access for all faculties.
- Kyambogo University finalised its policy document on ICT.

Distance education at the tertiary level has been underway in Uganda for some years, provided by both public and private institutions. Makerere and Kyambogo Universities are particularly active and both are partners with the African Virtual University. Makerere University's B.Ed. (External) is specifically developed for upgrading teachers to the bachelor's level and is the largest distance education programme for teachers in the country. A recent survey[18] of students enrolled in the distance education programme at Makerere University concluded that while the potential of ICT use is huge, student access to the infrastructure is a major constraint.

The development of an open university has been under consideration for some time and, according to the ministry's 2005-2006 Review, it will be actively considered in 2007. However, as has pointed out,[8] there are a number of constraints that need to be addressed if ICT-based distance education is to be viable in the country.

Current ICT Initiatives and Projects

Table 4 summarises the current and recent ICT initiatives and projects in Uganda. [19]

Table 4: ICT Initiatives and Projects

Project: Providing donated computers to schools plus capacity-building support to recipient local partners. • *Organisation(s)/funding sources:* World Computer Exchange in partnership with local organisations. • *Geographic scope and time frame:* National

- *Contact:* www.worldcomputerexchange.org/

Project: The Village Phone Project provides micro loans to eight local businesses to enable establishing a community phone service. Testing of additional technologies will be done.

- *Organisation(s)/funding sources:* Grameen Foundation in partnership with MTN Uganda
- *Geographic scope and time frame:* Started in 2003 in selected communities; ongoing.
- *Contact:* www.grameenfoundation.org/where_we_work/sub_saharan_africa/uganda/village_phone_uganda/

Project: I-Network Uganda is a national network of individuals and organisations that act as a platform for sharing knowledge and information on applying ICTs. One of its programmes, DistrictNet, focuses on providing public information using ICTs.

- *Organisation(s)/funding sources:* ICT4D practitioners including IICD project partners; policy makers such as ministries; students and teachers; NGOs; rural communities
- *Geographic scope and time frame:* National; over 700 registered members from the public, private, and civil society sectors. Begun in 2002; ongoing.
- *Contact:* www.i-network.or.ug/

Project: The spread of mobile phones and FM radio stations has enabled the development of an interactive public discussion forum in local languages on topics such as politics, health issues, agriculture, education, gender issues, and the environment.

- *Organisation(s)/funding sources:* Over 100 FM radio stations
- *Geographic scope and time frame:* National; ongoing.
- *Contact:* http://researchictafrica.net/index.php?catid=18

Project: Uconnect is a non-profit NGO that aims to advance public education by using ICT to improve the quality and efficiency of communications. Activities focus on providing computer connectivity and training for schools and recently on providing ICT training to officials of 22 mostly rural districts.

- *Organisation(s)/funding sources:* More that 225 schools have benefited to date and 22 district offices have been connected to the Internet. Multi-sponsors are involved such as telecom, hardware, learning software, transportation, and Internet provider companies.
- *Geographic scope and time frame:* National; began in the late 1990s and continues to thrive.
- *Contact:* www.uconnect.org/

Project: The Uganda Ministry of Education and Sports is taking several initiatives over the next year as part of its policy implementation agenda. Examples include providing equipment and training to selected schools, providing Microsoft software to government-aided secondary schools, and including the approval of a curriculum for ICT training for secondary schools.

- *Organisation(s)/funding sources:* The ministry has allocated some funds for these initiatives and is discussing provision of additional support with various donors.
- *Geographic scope and time frame:* National; 2006-2007.
- *Contact:* ICT Co-ordinator, Ministry of Education and Sports

Project: The Reflect ICT resource centre has been equipped with computers (Internet connected), printers, digital camera and video, generator, UPS, public address system, WorldSpace radio, and solar-operated radios, along with other office equipment including a photocopier. The aim is to facilitate access to agricultural, health, and commercial information based on needs that the

community identified.

- *Organisation(s)/funding sources:* DIFD, and community contributions.
- *Geographic scope and time frame:* The project is located in Bukuuku sub-county in Kabarole district, western Uganda.
- *Contact:* http://217.206.205.24/Initiatives/ict/home.htm

Project: Phase I of the Connectivity for Educator Development Project (Connect Ed) set up computer centres and Internet points of presence at Kyambogo University (KyU) and at eight primary teachers' colleges (PTCs). It provided computer literacy and materials development training for teacher educators, and began to re-purpose the print-based national PTC curriculum into an interactive, accessible online version. Connect-ED Phase II builds on the infrastructure established in Phase I but with closer collaboration with the Ministry of Education and Sports and KyU. The focus is on sustainability and long-term ICT strategies for KyU and the PTCs and on continuing to provide computer training and completing the digitisation and enhancement of the national PTC curriculum.

- *Organisation(s)/funding sources:* Phase I was funded by USAID. Initial partners included Computer Frontiers (for Internet connectivity), World Links (for Development for training in the colleges), Schools Online (for equipment procurement), and Academy for Educational Development (for the projects at ITEK). Phase II is supported by International Education Systems, a division of Education Development Center, an international, non-profit organisation.
- *Geographic scope and time frame:* National. Phase I: 2001-2003; Phase II: 2003 to present.
- *Contact:* http://ies.edc.org/ourwork/project.php?id=3448 (For an evaluation report of Phase I for lessons learned and recommendations, see www.eduaction.net/connect-edtext.pdf.)

Project: The National Curriculum Development Centre (NCDC) established the CurriculumNet project in an effort to create electronic learning materials using CD-Roms. The project is now using ICTs to provide instructors with multimedia materials they can use in selected core subjects. Government approval was given in 2004 for ICT-based curriculum materials in mathematics and geography for primary schools and mathematics and science for secondary schools, thus enabling use of the material by all schools in the country.

- *Organisation(s)/funding sources:* SchoolNet Uganda with funding from IDRC
- *Geographic scope and time frame:* National; 2001-2005.
- *Contact:* www.idrc.ca/en/ev-64993-201-1-DO_TOPIC.html

Project: A project using VSATs to offset the high cost of connectivity and to demonstrate the use of ICT-equipped schools as school-based community learning centres.

- *Organisation(s)/funding sources:* World Links, Schools Online, the Bill and Melinda Gates Foundation, and SchoolNet Uganda
- *Geographic scope and time frame:* Rural focus; ongoing.
- *Contact:* www.schoolnetuganda.sc.ug/homepage.php?option=vsatproject

Project: The British Council has launched a project to link schools in Uganda to other schools in Africa and the UK. The project, code-named Connecting Classrooms, is aimed at co-ordinating ICT, science, vocational skills, global citizenship, and cultural science in the schools.

- *Organisation(s)/funding sources:* The British Council
- *Geographic scope and time frame:* Limited number of schools; 2006-2007.
- *Contact:* www.britishcouncil.org/uganda-governance-connecting-classrooms.htm

Project: The Women of Uganda Network (WOUGNET) is a place to share news, information and

activities on female-related issues in Uganda. WOUGNET's goal is to promote the use of ICTs by women's organisations and individuals for the better being of Ugandan women.

- *Organisation(s)/funding sources:* Three levels of membership: individuals, women's organisations based in Uganda, and affiliated organisations interested in ICT4D. WOUGNET is supported by a number of volunteers, including those based in Uganda as well as online. There is no fee for WOUGNET membership.
- *Geographic scope and time frame:* National; launched in 2000 and ongoing.
- *Contact:* www.wougnet.org/aboutus.html

Project: Improving health care delivery through continuing medical education (CME) for rural health workers by using ICTs and multimedia. The major focus is on gathering and repackaging high-quality health information for dissemination through ICTs. Training in the use of basic ICTs is provided.

- *Organisation(s)/funding sources:* Co-sponsored by Cordaid and IICD and implemented by Uganda Martyrs University, Faculty of Health Sciences, and the three hospitals of Itojo in Ntungamo district, Nkozi in Mpigi district and Mutolere in Kisoro district
- *Geographic scope and time frame:* District-based; ongoing.
- *Contact:* www.iicd.org/projects/articles/iicdprojects.2005-12-09.7746900390

Project: ICT maintenance facilities for rural Uganda have been established at five technical colleges. An ICT maintenance facility will be set up at each college to provide technical support and to introduce a new course called ICT Installation and Maintenance to train technicians.

- *Organisation(s)/funding sources:* The Uganda Institute of Information and Communications Technology, established by Uganda Communications Commission, manages the project with the support of the International Institute for Communication and Development.
- *Geographic scope and time frame:* The five UTCs are located in or near upcountry towns and are geographically well distributed throughout the country. Launched in 2005; ongoing.
- *Contact:* www.iicd.org/projects/articles/iicdprojects.2005-07-29.8068367475

Project: Makerere University Faculty of Computing and Information Technology has won an Africa Union (AU) bid to create an e-network that will provide connectivity for eastern and central African countries to a pan-African network through fibre optics and wireless links. This will enable the sharing of resources such as BlackBoard digital learning software, backups, and e-learning courses. The faculty has a department that trains staff in e-learning and supports e-learning in the whole of the university.

- *Organisation(s)/funding sources:* Funding is through the Government of India through the AU. Makerere will be the lead university serving Comoros, Djibouti, Eriteria, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Somalia, Sudan, Tanzania, and Uganda.
- *Geographic scope and time frame:* Eastern and central African regions; project was announced in July 2006.
- *Contact:* http://cit.ac.ug/site/downloads/issue4.pdf

Project: SchoolNet Uganda's mission is to make graduates of Uganda's education system more globally competitive. SchoolNet Uganda supports educators and learners by providing pedagogical and technical expertise and advice, infrastructure and human resources, co-ordination, training and capacity-building, and developing local and international partnerships.

- *Organisation(s)/funding sources:* Multiple partners depending on projects
- *Geographic scope and time frame:* National; ongoing.
- *Contact:* www.schoolnetuganda.sc.ug/homepage.php?option=home

Implementing ICT in Education: What Helps and What Hinders?

The core factors that influence the adoption and diffusion of ICTs in education have been identified in many studies and project reports such as the UNESCO *Meta-survey on the Use of Technologies in Asia and the Pacific*[20] and, in the context of East Africa, by IDRC in its thorough analysis of ICT policy-making in the region.[21] Two other studies that have discussed some of these factors in the higher education sector are those carried out by the United Nations National University[22] and by the African Virtual University.[23] What emerges from these analyses is that the factors are essentially the same in both developed and developing economies, although they differ in terms of importance depending on which side of the "digital divide" they are viewed from. What differentiates the rate of adoption and diffusion is not a difference in the factors at play, but rather the degree to which they have been developed or are present in a given country.

Table 5 provides a summary of the current stage of ICT development in Uganda in terms of enabling or constraining features in the education system.

Table 5: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation plans	The national policy underlines the importance of ICT in human resource development and has provided a basis for the development of ICT policy in the education sector that is currently pending approval by Cabinet. In the meantime, the Ministry of Education and Sports is planning several implementation initiatives for the next year.	The speed with which the policy can be implemented will depend on available resources and access to electricity and ICT infrastructure. Predictably, implementation will proceed more slowly in rural areas.
Advocacy leadership	The National Planning Authority and the Ministry of ICT are strong advocates and have a mandate to ensure that sector policies are developed and supported. The Ministry of Education and Sports has now created a management structure to provide leadership on ICT applications.	
Gender equity	Gender equity is stressed in the policy statements and in the ICT	Female participation rates, while near even at the primary level, begin

	training being provided to teachers. Some projects are underway that focus on access for women groups; perhaps most significantly is the Women of Uganda Network (WOUGNET).	to drop at the secondary level and much more remarkably at the tertiary level.
Infrastructure and access	Availability and access are improving rapidly in the urban areas aided by the growth of wireless networks and mobile telephony.	The lack of infrastructure and supply of reliable electricity supply seriously constrains the adoption of ICT in rural areas. Further, the cost of bandwidth is a universal constraint to Internet use.
Collaborating mechanisms	The need for collaboration is realised and mechanisms are emerging within government and within the various departments and institutions of the ministry.	It is still "early days" in the process of adapting government structures and business processes to the applications of ICTs. ICT adoption in the education sector has benefited from the efforts of many groups. The ministry will need to develop strategies to ensure this continues in an "added value" manner.
Human resource capacity	Human resource capacity is recognised in policy documents as being critically important. Tertiary-level institutions are being supported in addressing training needs, and the secondary curriculum is being revised to enable increased focus on ICT education.	Comparatively few teachers have the skills to make pedagogical use of ICTs for teaching across the curriculum. Teachers who receive such training are often unable to use their skills because of the lack of access to infrastructure.
Fiscal resources	The ministry is making an effort to spend some of its resources differently in order to begin implementing its ICT strategy.	The lack of resources is a serious constraint and may become more so with the planned introduction of universal access to secondary education. Implementation of the policy will depend significantly on donor support.
Learning content	Efforts have started to develop digital content.	The lack of available relevant and linguistically appropriate content is a major constraint.
Procurement regulations	The need to update and streamline regulations and procedures is recognised by government.	
Attitudes	The importance of ICTs to national	Attitudes seem to vary regarding the

	development and the need to be ICT literate is recognised throughout the education system.	use of distance and open learning/e-learning. The tertiary sector seems more disposed to embrace such delivery strategies, perhaps because of more substantial experience.
Sustainability	The ministry has recognised the need to ensure that projects are planned on the basis of a "total cost of ownership" basis.	Educators have seen so many projects fail because they could not be sustained beyond the pilot phase.

Notes

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ICT in Education in Zambia

by Shafika Isaacs
May 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

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It is expected that individual *Country Reports* from the *Survey of ICT and Education in Africa* will be updated in an iterative process over time based on additional research and feedback received through the *info*Dev web site. For more information, and to suggest modifications to individual *Country Reports*, please see www.infodev.org/ict4edu-Africa.

Overview

Tthe penetration levels of ICTs in Zambia's education institutions remains low, with those schools that are equipped mostly utilizing second-hand and refurbished computers. The integration of ICTs in learning and teaching practice has been limited, although the introduction of computer studies as a school study subject has begun to change this. The recent adoption of a national ICT policy, as well as the development of a draft ICT policy for education and an associated implementation framework, provides an enabling policy environment to promote far greater access and use of ICTs across all sectors of Zambia's education system, including a system for enhancing education management, administration, and teaching and learning. While the goals and targets set in these policy documents seem realistic, realising them within the established time frames remains a challenge.

Country Profile

Zambia is one of the poorest countries in the world; more than three-quarters of the population live on less than USD$1 per day. Zambia also suffers a high rate of HIV/AIDS, with 16% of Zambians age 15 to 49 years being HIV positive and an estimated 1.1 million children orphaned, many themselves HIV positive.[2] There is chronic food insecurity and weak governance with devastating social and economic consequences. The economy is vulnerable to natural disasters such as flood, drought, and animal disease which impacts food security.[3]

The Zambian economy has historically been heavily dependent on copper mining. Since the early 1970s the terms of international trade shifted towards a significant decline in copper prices. This led to the closure of mines and had a far-reaching effect on the economy. Slow progress in diversifying the economy and high levels of borrowing and debt relief are contributing factors to the country's economic malaise.[4]

Table 1 provides some selected socio-economic indicators for Zambia.

Table 1: Socio-economic Indicators: Zambia

Indicator	
Population	11.7 million (2005)
Languages	Official language: English. Local languages: Bemba, Kaonda, Lozi, Lunda, Luvale, Nyanja, and Tonga.
2005 Economic activity (% of GDP)	Agriculture: 18.6% Industry: 25.2% Services: 56.3%
Human Development Index	165 (out of 177 countries)[5]
Per capita gross national income	$400 (2004); $490 (2005)

(US dollars)	

More recently, the Zambian economy has been showing signs of improvement precipitated by growth in the mining, manufacturing, tourism, and construction sectors. Zambia has also received extensive debt relief based on the outcome of the Group of 8 meeting in Gleneagles in July 2005 and the Multilateral Debt Relief Initiative (MDRI). Its external debt burden has reportedly been reduced from $7.1 billion to $0.5 billion, which makes available funds allocated to pay back loans, to be spent on health and education.[6]

The Education System

Zambia's education structure starts with four years of pre-school education, which are optional. Primary schooling extends over seven years at an entrance age of seven years, followed by five years of secondary education at an entrance age of 14. Currently the Zambian government is placing emphasis on ensuring the provision of primary education. In 2005 Zambia had 6,962 basic schools with 2.8 million learners and 463 high schools with more than 136,000 learners.[7]

Almost two-thirds of the children end their education at the primary level. Only one-third of the primary school dropouts have the opportunity to go to secondary education. Of those who enroll for primary education, less than 20% enter secondary school, and only 2%of the 20 to 24 age group enter a university or some other form of higher education.[8]

Higher education is provided by two universities under the aegis of the Ministry of Education and various specialised institutions (colleges and institutes) controlled by the Ministry of Science, Technology and Vocational Training. Primary and pre-primary school teachers are trained at primary school teacher-training colleges while secondary school teachers are trained in teacher colleges and at the University of Zambia.

Distance higher education is offered by technical and vocational colleges and the University of Zambia.

Table 2 provides a quantitative perspective of some selected system indicators.

Table 2: Selected Education Data

Indicator	
Enrolment in primary education (% gross)*	99 (2004)
Enrolment in secondary education (% gross)*	26 (2004)
Transition to secondary	54 (2003)
Gender Parity Index (GPI)**	0.98 in primary; 0.79 in secondary (2004)

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.
**GPI = gross enrolment ratio (GER) of females, divided by the GER of males and indicates the level of access by females to education compared to males. A GPI of 0.79 suggests there is limited gender parity.

Despite the introduction of free basic education in 2002, many girls and other vulnerable groups drop out of school before they complete primary school, largely due to poverty and the impact of HIV and AIDS on families. According to UNICEF, the Zambian education sector has a combination of low school enrolment and low school achievement, which means that one out of five children realise their right to quality basic education.[9] Adult literacy in Zambia was 80.6% in 2003 (86.8% for men and 74.8% for women).[10]

The Department for International Development (DFID) reports more recently, however, that Zambia has shown improved performance against the Millennium Development Goals (MDGs) in primary universal education and promoting gender equality in schools with net enrolment rates increasing from 71% in 2000 to 95.6% in 2005. However, DFID also notes that more needs to be done if the MDGs are to be achieved by 2015.[11]

Infrastructure

Zambia has a modest ICT infrastructure that is concentrated in urban centres. Zambia underwent a process of liberalisation of its telecommunications and broadcast sectors in the early 1990s.

Table 3 provides a snapshot of the state of national ICT infrastructure in Zambia.[12]

Table 3: ICT in Zambia

Fixed-line subscribers (2004)	91.7 per 1,000 persons
Mobile subscribers (2004)	464 per 1,000 persons
Dial-up subscribers (2004)	16.5 per 1,000 persons
Broadband subscribers (2004)	0.023 per 1,000 persons
Internet users (2004)	231 per 1,000 persons
Television broadcast stations (2002)	9
Radio stations (2001)	AM 19 ; FM 5; shortwave 4

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The current regulatory framework is fragmented with three bodies regulating the sector. The Communications Authority regulates the telecommunications sector, the Ministry of Communications and Transport regulates the postal and courier services, and the Ministry of Information and Broadcasting regulates broadcasting. There will be attempts to harmonise the regulatory framework with closer collaboration between the different ministries in view of the country's new national ICT policy.

A major boost to Zambia's ICT infrastructure is the impending establishment of the East African Submarine Cable System (EASSy), which is a submarine optical fibre system running along the east coast of Africa and which includes some of the landlocked countries like Zambia. This project is facilitated by the New Partnership for Africa's Development (NEPAD) eAfrica Commission in partnership with a host of telecom companies; in Zambia, Zamtel is the key partner.[13]

ICT Policies

National Vision 2030

The National Vision 2030 is the Zambian government's long-term plan "to be a prosperous middle income nation by the year 2030." The vision emanates from a series of discussions with a range of stakeholders from civil society, the private sector, and within government, and it articulates national and sectoral goals for the socio-economic development of Zambian economy and society.

Fifth National Development Plan

The Fifth National Development Plan (FNDP) represents the fifth of a series of successive five-year plans to promote the social and economic development of Zambia. The FNDP extends from 2006 to 2010 and has "broad based wealth and job creation through citizenry participation and technological advancement" as its theme and "economic infrastructure and human resources development" as its strategic focus. Unlike previous national plans, the FNDP makes specific references to ICT development. It proposes the installation of provincial and district fibre optical cables and the establishment of rural community multi-purpose telecentres.

The FNDP represents the engine for developing other forms of ICTs including capacity-building related to technologies and equipment as well as broadening access content such as news, information, and knowledge resources by the general public.[14]

National ICT Policy

In March 2007, the Zambian government launched its national ICT policy. At the launch, President Mwanawasa reportedly emphasised the creation of an innovative, market responsive, highly competitive, co-ordinated, and well-regulated ICT industry.[15]

The policy identifies three goals for ICT:

- To enable a diversified and export-oriented economy
- To improve livelihoods and protect the vulnerable through service delivery
- To provide an efficient and effective public sector

The policy recognises the need to face the following challenges in education:

- Low levels of ICT literacy
- High cost of technology acquisition

- "Brain drain" resulting in considerable loss of skilled personnel
- Limited local ICT industry
- Lack of standardisation and certification programmes in ICT
- Inadequate institutional capacity

The policy states that computer studies was introduced as a subject in public schools in 1998 and that Zambia's private schools were producing ICT literate students. It also highlights challenges such as the financial and technological resource constraints, inadequate awareness on the benefits of integrating ICTs in the administration of the delivery chain of education sector, and the high opportunity costs and lack of co-ordination.

While the policy does not provide clear guidelines on how the challenges will be confronted, it does suggest the need to scale up the introduction of computer studies in schools and the need to focus research and development on products to service the local market.

ICT Policy in Education

With the support of the International Institute for Communication and Development (IICD), the Commonwealth of Learning (COL), and the United States Agency for International Development (USAID), the Zambian Ministry of Education had developed a draft ICT policy for education by October 2006[16] and an implementation strategy by January 2007.[17] This represents an extension of Zambia's national education and national ICT policies. The vision is for ICTs to contribute towards reaching innovative and lifelong education and training in Zambia by 2030.

The guiding principles of policy include the following:

- It must fit into national policies on education and ICTs
- There is a commitment to establishing strategic partnership with stakeholders
- There is a combined effort with government, the private sector, and NGOs
- The policy reflects general standards that the Ministry of Education wishes to uphold
- An integrated approach must be adopted that integrates all aspects of the value chain in the education process

The policy also provides an overview of goals, objectives, and government commitment in key programme areas of ICT infrastructure to education institutions, content development, curriculum integration, teacher training, distance education, administration and support services, and finance.

Linked to the policy is an implementation framework that sets out in detail the implementation objectives, activities, time frames, and budgets for each of these programme areas. It also outlines the ministry's commitment to promote collaboration between the private sector and education institutions and to establish appropriate structures to facilitate the integration of ICTs in the education system. The estimated

budget to support access to computer facilities and Internet access to the ministry headquarters, provincial offices and districts; the 14 colleges of education; the nine provincial, 78 district, and 400 zonal resource centres; and the 350 high schools and 460 basic schools is USD$63.6 million.

Current ICT Initiatives and Projects

Computers for Zambian Schools Trust
The Computers for Zambian Schools is a registered trust established by the local educational and ICT specialists, representatives from the British Council, Ministry of Education, and the Beit Trust. It operates as a partnership between the Computers for African Schools, which is a UK-based registered charity, the British Council, HSBC, the British High Commission, the Beit Trust, SchoolNet Zambia, MTN, ZamNet, and the Zambian Ministry of Education.

The British Council has reportedly facilitated the import of duty-free equipment to Zambia. The Beit Trust provided grants to the project and MTN supported the operating costs for the technical centre.

To date the project has reportedly sent 4,500 computers that reached 300 schools in Zambia. It is based at a boys' high school in Lusaka where it takes in PCs and refurbishes and redistributes them to schools to be used to support the study of computer studies.

The main activities in which Computers for Zambian Schools are involved include training of ICT teachers, distribution of ICTs to schools, provision of technical support to schools, and recycling computers in partnership with a South African company.

For more information: http://www.cfzs.org.zm

eBrain Forum
eBrain is a non-profit, membership-based organisation that promotes ICTs for development in Zambia. Its objectives are to lobby, advocate, build capacity, and conduct research on ICT for development issues.

For more information: www.ebrain.org.zm

SchoolNet Zambia
SchoolNet Zambia was initially established as a short-term pilot project supported by the IDRC in the late 1990s. When this project came to an end, the organisation paused for a while and was then re-started with the support of SchoolNet Africa and its partnership with Multichoice Africa and the Open Society Initiative for Southern Africa (OSISA). With the support of Multichoice Africa and Multichoice Zambia, SchoolNet Zambia was able to promote access to satellite television and video in a few schools in order for learners and teachers to access education channels such as Mindset Learn, Discovery

Channel, and National Geographic. With the support of OSISA and in partnership with Computer for Zambian Schools, it extended the PC refurbishment centre.

For more information: http://www.schoolnet.org.zm

OneWorld Africa
OneWorld Africa is a registered NGO in Zambia which forms part of the OneWorld International online network of media and human rights practitioners and civil society organisations. OneWorld Africa has been involved in lobbying and advocacy on ICT for development issues in Zambia, including education. OneWorld Africa has an Education Support Network Project that involves volunteers in the development of teacher support materials for nine schools in the country. OneWorld Africa also has a collaborative partnership on thematic channels such as its learning channel, which provides information on education opportunities for individuals and institutions across the globe. Another is its kids' channel which provides a host of information and learning opportunities for children.

For more information: Africa.oneworld.net

University of Zambia and Copperbelt University
The University of Zambia and the Copperbelt University offer computer science as a study subject, and both institutions have invested in ICT infrastructure. The University of Zambia installed PCs with Internet connectivity in its regional offices. The Copperbelt University has a curriculum development centre that develops the syllabus on computer studies for Grades 1 to 9 with Grades 10 to 12 following international syllabuses on ICTs.

For more information: www.unza.zm

UNESCO Distance Learning Course on Telecentres[18]
In 2004 UNESCO supported the establishment of three learning centres in five African countries including Zambia. The project provided the centres with digital radios, data interfacing equipment, and technical backup, which enabled large numbers of local learners to participate in a course on telecentres. The course was delivered using the combined live audio and slide show (CLASS) technology of WorldSpace Corporation.

Resource Co-operative Society
The International Institute for Communication and Development (IICD) supports the Resource Co-operative Society in Ndola, which uses computers to conduct small-scale training for students and members of the community in lifelong skills to improve their employability.[19]

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in Zambia in terms of enabling or constraining features in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation	Zambia has a national ICT policy that includes references to ICTs in education. Zambia also has a draft national ICT for education policy and implementation framework developed by its Ministry of Education which is the outcome of a multi-stakeholder consultative process.	
Advocacy leadership	Zambia has had dedicated champions for the cause of ICTs for development both within government and civil society.	
Gender equity	The national ICT policy mentions a stated commitment to gender equality and women's empowerment.	While the ICT for education policy and implementation framework make some references to gender, they do not explicitly refer to the promotion of gender equality and women's empowerment. These considerations may well be included in subsequent drafts.
Infrastructure and access	Zambia's national policies promote a commitment to universal access, and a range of organisations and groups have made headway in improving the country's ICT infrastructure.	
Collaborating mechanisms	Zambia's national ICT policy and draft ICT for education policy both promote multi-stakeholder collaboration and propose the establishment of dedicated structures to facilitate collaboration.	
Human resource capacity		Zambia has extremely limited human resource capacity.
Fiscal resources		Zambia's ICT for development strategy is strongly dependent on external donor funding.

Learning content	The implementation framework to support the ICT for education policy provides a detailed plan for the promotion of localised electronic content. Zambia has also introduced computer science as a subject in school and the draft policy promotes the greater spread in the provision of computer science as a school-based subject.	There is little digital education content based on the local curriculum frameworks available in Zambia's education institutions.
Procurement regulations	Organisations like Computers for Zambian Schools and their partners have successfully negotiated duty-free import of equipment.	
Attitudes	The leadership of Zambian government, the local private sector, and civil society have demonstrated an enthusiasm and positive attitude in promoting ICTs for development in general and in education in particular.	

Notes

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ICT in Education in Zimbabwe

by Shafika Isaacs
April 2007

Source: *World Fact Book*[1]

Please note:

This short *Country Report*, a result of a larger *info*Dev-supported *Survey of ICT in Education in Africa*, provides a general overview of current activities and issues related to ICT use in education in the country. The data presented here should be regarded as illustrative rather than exhaustive. ICT use in education is at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports should be seen as "snapshots" that were current at the time they were taken; it is expected that certain facts and figures presented may become dated very quickly.

The findings, interpretations and conclusions expressed herein are entirely those of the author(s) and do not necessarily reflect the view of *info*Dev, the Donors of *info*Dev, the World Bank and its affiliated organizations, the Board of Executive Directors of the World Bank or the governments they represent. The World Bank cannot guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply on the part of the World Bank any judgment of the legal status of any territory or the endorsement or acceptance of such boundaries.

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Overview

Zimbabwe has been beleaguered by economic, social, and political turmoil in recent years which has had a debilitating effect on its already-declining education system. The country nevertheless has a dedicated national ICT policy that was adopted in 2005 and that makes significant references to the promotion of ICTs in education including pedagogical use in educational institutions. Zimbabwe also has a vibrant civil society sector that promotes ICT for development and education, of which organisations such as World Links Zimbabwe has played a pioneering role since the late 1990s.

Introduction

Over the past few years, the Zimbabwean economy has been beset with crises, characterised by an unsustainable fiscal deficit, an overvalued exchange rate, and rampant inflation (which stood at 1,000% in 2006). The government's controversial land reform programme has reportedly been the cause of significant damage to the commercial farming sector rendering the country a net importer of food after having traditionally been the source of jobs, exports, and foreign exchange. Financial support from the International Monetary Fund was also suspended due to arrears in repayments on loans.[2]

Zimbabwe ranks higher on the UNDP Human Development Index than Angola, Eritrea, Nigeria, Rwanda, and Zambia which are all, along with Zimbabwe, classified as low-income countries. Over 50% of Zimbabwe's population lives on less than $1 a day. The country faces a food emergency and has among the sharpest increases in child mortality in history. According to UNICEF, Zimbabwe also has the world's fourth-highest rate of HIV prevalence with about 25% of the population reportedly HIV positive. Young people, especially girls, bear the brunt of the pandemic. Approximately 1.3 million, or one-fifth of all Zimbabwean children have lost a parent; most have been orphaned by AIDS. UNICEF further suggests that the HIV/AIDS pandemic has slashed the average life expectancy from 61 to 33 years since 1990.[3]

Table 1 provides some selected socio-economic indicators for Zimbabwe.

Table 1: Socio-economic Indicators: Zimbabwe

Indicator	
Population	13 million (2005)
Languages	Official language: English. National languages: Shona and Ndebele.
2005 Economic activity (% of GDP)	Agriculture: 22.4% Industry: 28.0% Services: 49.7%
Human Development Index	151 (out of 177 countries)
Per capita Gross National	$620 (2004); $340 (2005)

Income (US dollars)	

The Education System

In the first two decades after Zimbabwe obtained independence in 1980, the country boasted one of the best education systems in the southern African region. During these years, the government focused on expanding education access by building schools in marginalised areas and disadvantaged urban centres, accelerating the training of teachers, and providing teaching and learning materials to schools. Double shifts were introduced to manage increasing enrolment, untrained teachers were hired to help with the teaching load, and low-cost teacher training schemes were introduced where only two terms of the four-year course were spent in college and the remaining two years were spent training in schools.

Currently, primary education is compulsory, commencing at age six and running a seven-year cycle to Grade 7. Secondary education commences at age of 13 with Form 1 (Grade 8). Parents can choose either expensive private, church-affiliated, or government boarding schools or the cheaper day schools. Secondary education comprises a four-year O-level cycle and a two-year A-level cycle.

Both primary and secondary education is run by the Ministry of Education, Sport and Culture, while tertiary education is managed by a separate Ministry of Higher Education. Tertiary education incorporates all universities, technical colleges, polytechnic colleges, teacher-training colleges, and other vocational skills training centres.

In 2003 the country boasted among the highest literacy rates in the region with an overall rate of 90.7% according to the UNDP (male literacy 94.2%; female literacy 87.2%)[4] However the tremendous strides made in primary and secondary education enrolment in the first two decades of independence were soon eroded as soaring school fees made education increasingly unaffordable and many teachers left the country.[5]

Table 2 provides a quantitative perspective of some selected system indicators.

Table 2: Selected Education Data

Indicator	
Enrolment in primary education (% gross)*	96 (2004)
Enrolment in secondary education (% gross)*	36 (2004)
Transition to secondary	70 (2003)
Enrolment in tertiary education (% gross)	4 (2004)
Gender Parity Index (GPI)**	0.98 in primary; 0.91 in secondary; 0.63 at university (2004)

*Percent of gross is the number enrolled as a percentage of the number in the eligible age group.

**GPI = gross enrolment ratio (GER) of females, divided by the GER of males and indicates the level of access by females to education compared with males. In Zimbabwe, the GPI suggests there is slightly less that parity at the primary and secondary levels, and significantly under parity at the university level.

Infrastructure

According to the World Economic Forum's *Global Information Technology Report*, Zimbabwe ranks 105th out of 115 economies in 2005-2006, based on a networked readiness index, which measures the degree of preparation of a nation to participate in and benefit from ICT developments.[6] This ranking is slightly higher than Benin, Chad, and Ethiopia.

Table 3 provides a snapshot of the state of national ICT infrastructure in Zimbabwe.[7]

Table 3: ICT in Seychelles

Indicator	
Fixed-line subscribers (2004)	317.0 per 1,000 persons
Mobile subscribers (2004)	424 per 1,000 persons
Dial-up subscribers (2004)	32.0 per 1,000 persons
Broadband subscribers (2004)	0.75 per 1,000 persons
Internet users (2004)	820 per 1,000 persons
Television broadcast stations	16 (1997)
Radio stations	AM 7; FM 20; shortwave 1 (1998)

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A major boost to Zimbabwe's ICT infrastructure is the impending establishment of the East African Submarine Cable System (EASSy), which is a submarine optical fibre system running along the east coast of Africa and which includes Zimbabwe. This project is facilitated by the New Partnership for Africa's Development (NEPAD) e-Africa Commission in partnership with a host of telecom companies in Africa.[8].

ICT Policies

The Zimbabwean government adopted a national ICT policy in 2005 that was informed both by a Harvard University-guided e-readiness survey, which suggested the country was not uniformly e-ready, and by a host of preceding general and sectoral policies including Vision 2020, the national science and technology policy adopted in 2002, and the Nziramasanga Education Commission Report which in 1999 recommended the promotion of the educational use of computers for teaching and learning in educational institutions.

The policy's *vision* is to transform Zimbabwe into a knowledge-based society by 2020, while its *mission* is to accelerate the development and application of ICTs in support of economic growth and development. The policy's *objectives* are to promote the development of ICT infrastructure, provide education and training programmes to

produce knowledge workers and qualified human resources, to establish relevant structures and institutional mechanisms to promote ICTs, and to encourage equitable access to ICTs across genders and to youth, the elderly, and people with disabilities

It also has a separate section on human resource development where it promotes skills training and capacity-building at all levels in the private and public sectors and in all training centres and institutions of learning.[9]

Current ICT Initiatives and Projects

AVU Teacher Education Project
The African Virtual University (AVU) established an ambitious teacher education project involving 10 African countries, in partnership with African Development Bank (AfDB) and the NEPAD in 2006. Zimbabwe is one of the 10 countries involved.

The programme focuses on mathematics and science education and the integration of ICTs in and across the teaching of the curricula in these two subject areas. The intention is to contribute to the growth of more and better quality teachers through the use of flexible, open, distance, and e-learning (ODeL) methodologies at an affordable cost for diploma, undergraduate, and graduate levels.

The specific objectives of the project are to enhance the capacity of teachers in the use of ICTs in teaching and learning of mathematics and science, to develop the capacity of teachers to deliver ICTs as a subject in secondary education, and to increase the number of mathematics and science teachers by expanding access to training through ODeL methods.

The project has set targets of developing six ODeL modules by early 2007, the content of which will be available in Portuguese, French, and English. The authors are drawn from 12 institutions in the 10 countries that the funding covers. The University of Zimbabwe is one of these 12 institutions.

For more information: www.avu.org/documents/Fact-Sheet.pdf

College IT Enhancement Programme (CITEP)
CITEP is a local capacity-building project supported by the Flemish Office for Development Co-operation and Technical Assistance (VVOB) in 10 Zimbabwean colleges. The focus is on developing capacity to maintain and manage ICT equipment and strategies for effective use of ICTs in the colleges. The project focuses on the following outcomes:

- Clear ICT policies in place in participating colleges and being effectively applied
- Technical and professional skills of college ICT unit staff upgraded
- Present ICT infrastructure in participating colleges fully utilised (including the development of staff development strategies for the promotion of ICT-supported teaching and learning)

- Creative human resources management in place in participating colleges for recruiting and retaining IT unit staff

For more information: www.citep.ac.zw

Kubatana Trust of Zimbabwe
The Kubatana Trust of Zimbabwe, which includes an NGO network organisation called the NGO Network Alliance Project (NNAP), has been established to strengthen the use of e-mail and Internet among Zimbabwean NGOs and civil society organisations and to provide human rights and civic education information and materials. Kubatana has a network of 240 NGOs and community service organisations which are involved in its lobbying and advocacy campaigns. Kubatana also provides Internet space to these organisations via an online directory.

For more information: www.kubatana.net

World Links Zimbabwe
World Links Zimbabwe is part of the international network of World Links organisations and has historically been a pioneer in the promotion of education through ICTs. The organisation has been active in Zimbabwe since mid-1999 when 12 ICT centres were established with the support of the World Bank and in partnership with the Ministry of Education Sport and Culture. Each of these pilot World Links centres were established near schools so that they could service both the schools and the community. In this sense World Links Zimbabwe pioneered the concept of school-based telecentres.

World Links Zimbabwe was also known for its introduction of a bus, known as the Big Blue, installed with computers supplied by groups such as Computers for African Schools based in the UK. The bus moves to remote rural areas to encourage access to ICTs by these communities.

World Links Zimbabwe is now an independent registered trust and has established partnerships with a host of organisations and institutions including Computers for African Schools and SchoolNet Africa, the latter for whose Campaign for 1 Million PCs it now leads and with whom, in partnership with the Open Society Initiative for Southern Africa, promoted access to open source software in schools as well as support for a local PC refurbishment centre. It now has 43 telecentres throughout the country of which 35 have dial-up connectivity to the Internet.[10]

For more information: http://www.world-links.org/en/countries/alumni/zimbabwe.html

Implementing ICT in Education: What Helps and What Hinders?

Table 4 provides a summary of the current stage of ICT development in Zimbabwe in terms of enabling or constraining features in the education system.

Table 4: Factors Influencing ICT Adoption

Factors	Enabling Features	Constraining Features
Policy framework and implementation	Zimbabwe has a national ICT policy which includes references to ICTs in education.	Zimbabwe does not have a dedicated specific national policy on ICTs in education.
Advocacy leadership	Zimbabwe has had dedicated champions for the cause of ICTs particularly within its vibrant civil society sector.	
Gender equity	The national ICT policy refers to access of ICTs across gender, reflecting an interest in promoting equal access.	More detailed elaboration on the promotion of gender equality and women's empowerment is not available in the national ICT policy.
Infrastructure and access	Zimbabwe's national ICT policy promotes the idea of developing an ICT infrastructure including a local industry.	
Collaborating mechanisms	The national ICT policy refers to the establishment of a national ICT authority that will promote policy coherence and collaboration, particularly within government. Civil society organisations have also established online networks on issues relating to ICT for development.	
Human resource capacity		Zimbabwe has limited human resource capacity.
Fiscal resources		Limited if any fiscal resources are committed by government to support ICT access and use.
Learning content		There is little digital education content based on the local curriculum frameworks available in Zimbabwe educational institutions.
Attitudes	The leadership of Zimbabwean government and civil society organisations have demonstrated an enthusiasm and positive	

	attitude in promoting ICTs for development in general and in education in particular.	

Notes

[1] https://www.cia.gov/cia/publications/factbook/geos/zi.html
[2] Ibid.
[3] http://www.unicef.org/infobycountry/zimbabwe_1403.html
[4] Kanyango, G. "Zimbabwe's Public Education System Reforms: Successes and Challenges." *International Education Journal.* 2005 6(1); 65-74.
http://ehlt.flinders.edu.au/education/iej/articles/v6n1/kanyongo/paper.pdf
[5] http://uk.oneworld.net/guides/zimbabwe/development?gclid=CPewoaT8yYsCFRw8gQodbRbMBQ
[6]http://www2.weforum.org/site/homepublic.nsf/Content/Global+Competitiveness+Programme/Global+Information+Technology+Report.html
[7] World Telecommunications Development Report. 2006. ITU.
[8] NEPAD ICT Infrastructure Program: Addressing Africa's ICT Infrastructure Challenges Using Broadband Networks. www.doc.gov.za/signing/Infrastructure.pdf
[9] Zimbabwe National Information and Communication Technology Policy Framework. December 2005. Government of Zimbabwe.
[10] http://topics.developmentgateway.org/elearning/rc/ItemDetail.do~343620?itemId=343620

Given the constantly changing nature of the Internet, we suggest that you copy the document or web site title (and author or organization name, as appropriate) of a resource below into your favorite search engine if a link on this page is not working.

About *info*Dev

*info*Dev is a partnership of international development agencies, coordinated and served by an expert Secretariat housed in the Global ICT Department (GICT) of the World Bank, one of its key donors and founders. It acts as a neutral convener of dialogue, and as a coordinator of joint action among bilateral and multilateral donors—supporting global sharing of information on ICT for development (ICT4D), and helping to reduce duplication of efforts and investments. To this end, *info*Dev sponsors cutting-edge research and analysis to help identify global best practice in the use of ICT4D.

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