

ICT in Education in Kenya

by Glen Farrell
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Source: World Fact Book¹

Please note:

This short *Country Report*, a result of a larger *infoDev*-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

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)

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 organisations 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 study¹⁴ 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 Network¹⁵ (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

<p>Project: The Learning Resource Centre: Offers training in educational management and integration of ICT for school managers, lecturers, and students.</p> <ul style="list-style-type: none"> • <i>Organisation(s):</i> Kenya Technical Teachers College in Nairobi • <i>Funding source:</i> Flemish Association for Development and Technical Assistance and UNESCO (during the first year) • <i>Contact:</i> www.vvobkenya.org/sites/LRCVVOB/index.htm
<p>Project: Provision of computers and training: A primary example of the several NGOs with similar goals that collaborate under the NICE umbrella.</p> <ul style="list-style-type: none"> • <i>Organisation(s):</i> Computers in Schools • <i>Funding source:</i> Multiple partners and sources (see list on Web site). • <i>Contact:</i> www.cfsk.org/home.htm
<p>Project: ICT equipment for schools: Computers purchased for 142 schools in support of the ICT in Education Strategy.</p> <ul style="list-style-type: none"> • <i>Organisation(s):</i> Kenya ICT Trust Fund • <i>Funding source:</i> Ministry of Education • <i>Contact:</i> www.education.go.ke/ICTFund.htm
<p>Project: Mukuru ICT Centre: ICT skill development for under-privileged youth opened as part of</p>

<p>the Mukuru Promotion Centre in Nairobi run by the Sisters of Mercy.</p> <ul style="list-style-type: none"> • <i>Organisation(s)</i>: Corporate consortia led by British Airways • <i>Funding source</i>: British Airways, Microsoft, Cisco, and others. • <i>Contact</i>: www.education.go.ke/ICTFORUM/ICT%20in%20Africa%20&%20Mukuru%20-%20Mrs.%20Mary%20Barry.pdf
<p>Project: Development of Learning Content: digitisation of curriculum content for delivery in schools.</p> <ul style="list-style-type: none"> • <i>Organisation(s)</i>: Kenya Institute of Education • <i>Funding source</i>: Ministry of Education • <i>Contact</i>: www.kie.go.ke/
<p>Project: Support Centres: Central and regional centres provide immediate solutions on ICT issues to schools via telephone or online inquiries.</p> <ul style="list-style-type: none"> • <i>Organisation(s)</i>: Ministry of Education • <i>Funding source</i>: Microsoft and the ICT Trust Fund • <i>Contact</i>: www.education.go.ke/Speeches/MN_ICT_Strategy_2August2006.html
<p>Project: Sponsored Schools: The introduction of computers and distance learning to supplement teaching and improve learning methods in Aga Khan schools in Kenya.</p> <ul style="list-style-type: none"> • <i>Organisation(s)</i>: Aga Khan Education Services • <i>Funding source</i>: Aga Khan Foundation • <i>Contact</i>: Aga Khan Foundation's education activities, www.akdn.org/agency/akf_concerns.html#education.
<p>Project: Internet cafés: More than 400 Internet cafés have been opened in urban and rural areas where there is electricity.</p> <ul style="list-style-type: none"> • <i>Organisation(s)</i>: Telcolm Kenya • <i>Funding source</i>: Telcolm Kenya • <i>Contact</i>: Dr. Speranza Ndege, www.elearning-africa.com/newsportal/english/news19.php
<p>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.</p> <ul style="list-style-type: none"> • <i>Organisation(s)</i>: e-Africa Commission, Ministry of Education, and two consortia led by Oracle and Microsoft • <i>Funding source</i>: Oracle, Microsoft, and the Ministry of Education • <i>Contact</i>: www.eafricacommission.org/docs/NEPAD%20e-SCHOOLS%20DEMO%20OVERVIEW.pdf
<p>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.</p> <ul style="list-style-type: none"> • <i>Organisation(s)</i>: Arid Lands Information Network-Eastern Africa (NGO) and the Ministry of Agriculture • <i>Funding source</i>: FORD Foundation, NOVIB, DFID, and OXFAM-GB • <i>Contact</i>: www.alin.or.ke/about/who.asp
<p>Project: Computer Skill Development: A free e-learning programme in computer skills for youth living in the slum areas of Nairobi.</p>

- *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 University¹⁸ 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
<i>Policy framework and implementation plans</i>	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.	
<i>Advocacy leadership</i>	The Minister of Education and the Permanent Secretary demonstrate a very strong commitment to the importance of ICT in education.	
<i>Gender equity</i>	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.
<i>Infrastructure and</i>		The lack of national infrastructure

<i>access</i>		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.”
<i>Collaborating mechanisms</i>	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.	
<i>Human resource capacity</i>	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.
<i>Fiscal resources</i>	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.

Notes

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