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<td>DDE</td>
</tr>
</tbody>
</table>
# Table of Contents

1 EXECUTIVE SUMMARY .......................................................................................................... 1

2 INTRODUCTION AND BACKGROUND ......................................................................................... 9

2.1 How GeSCI works with countries ......................................................................................... 9

2.1.1 What GeSCI provides ....................................................................................................... 10

2.1.2 Capacity building strategy ................................................................................................ 10

2.1.3 Programme design and execution ....................................................................................... 10

2.2 Purpose and Scope of Situational Analysis ............................................................................ 12

2.3 Methodology .......................................................................................................................... 12

2.4 Assumptions and Limitations ................................................................................................ 13

2.5 Previous GeSCI work in Kenya ............................................................................................. 13

3 OVERVIEW OF KENYA AND ICTS IN KENYA ........................................................................ 14

3.1 Overview of Kenya .................................................................................................................. 14

3.2 National ICT infrastructure .................................................................................................... 15

3.2.1 Key indicators ................................................................................................................... 15

3.2.2 Regulatory status and the National Optical Fibre Backbone Infrastructure .......................... 16

4 STATE OF EDUCATION AND TRAINING SECTOR ........................................................... 17

4.1 Education Policies and Strategies .......................................................................................... 17

4.2 Educational philosophy .......................................................................................................... 17

4.3 Education objectives and targets .......................................................................................... 18

4.4 Structure of the education and training system ...................................................................... 19

4.4.1 Early Childhood Education (ECE) .................................................................................. 20

4.4.2 Primary Education ............................................................................................................ 20

4.4.3 Secondary Education ....................................................................................................... 20

4.4.4 University Education ........................................................................................................ 21

4.4.5 TIVET .............................................................................................................................. 21

4.4.6 Adult and Continuing Education ....................................................................................... 22

4.4.7 Non Formal Education ..................................................................................................... 22

4.4.8 Teacher Education ............................................................................................................ 23

4.5 Summary of key statistics ...................................................................................................... 25

4.6 Inclusive Education and Special Education ......................................................................... 25

4.6.1 Inclusive Education .......................................................................................................... 25

4.6.2 Special Education ............................................................................................................. 26

4.7 Governance and management of the education system ......................................................... 27

4.8 Education funding .................................................................................................................. 28

4.8.1 Education Development Partners Coordination Group (EDCG) ..................................... 29

4.9 Major Challenges in the Education and Training Sector ...................................................... 29

4.9.1 Access to Education ......................................................................................................... 30

4.9.2 Quality ............................................................................................................................ 31

4.9.3 Equity .............................................................................................................................. 33

4.9.4 Relevance ......................................................................................................................... 34

4.9.5 Lack of coordination ........................................................................................................ 35

4.10 Steps government is taking to address challenges ................................................................. 35
5 STATE OF ICTS IN EDUCATION
5.1 ICT in Education Deployment
5.1.1 ICT Stocktaking
5.1.2 Deployment models
5.1.3 Connectivity
5.1.4 Electricity
5.1.5 Maintenance and technical support
5.2 ICT Integration in Education
5.2.1 Integration at secondary schools
5.2.2 Integration at Universities
5.2.3 Integration at TIVET levels
5.2.4 ICTs, Curriculum and Assessment methods
5.2.5 Digital content
5.2.6 ICT teacher training
5.3 ICTs and Educational Management
5.3.1 ICTs for Administration
5.3.2 Education Management Information Systems (EMIS)
5.4 Monitoring and Evaluation
5.5 Major ICT initiatives, partners and partnerships
6 INSTITUTIONAL CAPACITY
6.1 Government commitment to ICTs
6.2 ICT Policies and Strategies
6.3 Human Resources
6.4 Strategic Leadership and Management/Organizational structures
6.5 Financial Resources for ICT
6.6 Resourcing of ICT Units in Sector Ministries
7 GAPS AND CHALLENGES
7.1 Response to key educational challenges
7.2 ICT deployment and integration
7.3 Capacity constraints
8 CONCLUSION AND NEXT STEPS
8.1 Next Steps
ANNEXES
Annex 1: Summary of meetings and interviews for Situational Analysis
Annex 2: National and Sector policies and strategies
Annex 3: Brief overview of the key ministries responsible for the education and training sector
Annex 4: Documents and sources consulted
List of Figures
Figure 1 - A Policy Framework for Education, Training and Research (Source: Sessional Paper No. 1 of 2005).......................................................................................................................... 19

List of Tables
Table 1- Statistics on Telephone Internet and Mobile Cellular Subscriptions .......... 15
Table 2- Education Objectives and Targets................................................................. 18
Table 3- Statistics in the Education and Training Sector, 2009 Source: EMIS, MoE.... 25
Table 4- Statistics in Special Education Source EMIS (MoE)................................. 27
Table 5- Education and training sector Ministries and their areas of responsibility ...... 28
Table 6- Education National Budgetary Allocation (2009/2010).............................. 28
Table 7- Maintenance models..................................................................................... 45
Table 8- ICT Initiatives in Education ........................................................................ 57
Table 9- Factors involved in institutional capacity..................................................... 58
Table 10- ICT management structures...................................................................... 61
Table 11- Mandates and status of ICT management structures................................. 62
Table 12- Major education challenges and how ICTs could address them ............. 69
Table 13- Challenges related to deployment and integration.................................... 74
Table 14- Capacity constraints.................................................................................. 77
Table 15- Government officials and partners met for Situational Analysis ............... 82
### List of abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABE</td>
<td>Adult Basic Education</td>
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<tr>
<td>AED</td>
<td>Academy for Educational Development</td>
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<td>AEOs</td>
<td>Assistant Education Officers</td>
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<td>ASALs</td>
<td>Arid and Semi-Arid Lands</td>
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<td>BOGs</td>
<td>Board of Governors</td>
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<td>CHE</td>
<td>Commission for Higher Education</td>
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<td>CMCs</td>
<td>Centre Management Committees</td>
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<td>COMESA</td>
<td>Common Market for Eastern and Southern Africa</td>
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<td>DEG</td>
<td>Directorate of e-Government</td>
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<td>District Education Officer</td>
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<td>DFID</td>
<td>Department for International Development</td>
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<td>ECE</td>
<td>Early Childhood Education</td>
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<td>EDCG</td>
<td>Education Development Coordination Group</td>
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<td>eLA</td>
<td>e-Learning Africa</td>
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<td>EMACS</td>
<td>Enterprise and Messaging and Collaboration System</td>
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<td>ERSP</td>
<td>Economic Recovery Strategy Paper</td>
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<td>FPE</td>
<td>Free Primary Education</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>GeSCI</td>
<td>Global e-Schools and Communities Initiative</td>
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<td>HELB</td>
<td>Higher Education Loans Board</td>
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<tr>
<td>HQ</td>
<td>Headquarters</td>
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<tr>
<td>ICT</td>
<td>Information Communication Technology</td>
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<td>ICT/GDA</td>
<td>ICT Global Development Alliance</td>
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<td>ITU</td>
<td>International Telecommunications Union</td>
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<td>JICA</td>
<td>Japan International Cooperation Agency</td>
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<td>KCPE</td>
<td>Kenya Certificate of Primary Education</td>
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<td>KCSE</td>
<td>Kenya Certificate of Secondary Education</td>
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<td>Kenya Education Network</td>
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<td>Kenya Education Staff Institute</td>
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<td>Kenya Education Sector Support Programme</td>
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<td>Kenya Institute of Education</td>
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<td>Ksh</td>
<td>Kenya Shillings</td>
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<td>MHES&amp;T</td>
<td>Ministry of Higher Education, Science and Technology</td>
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<td>MoEST</td>
<td>Ministry of Education Science and Technology</td>
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<td>MOYAS</td>
<td>Ministry of Youth Affairs and Sports</td>
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<td>MTP</td>
<td>Medium Term Plan</td>
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<td>NICE</td>
<td>Network of Initiatives in Computer Education</td>
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<td>PDE</td>
<td>Provincial Director of Education</td>
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<td>PIM</td>
<td>Personal Information Management</td>
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<td>PRSP</td>
<td>Poverty Reduction Strategy Paper</td>
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<td>PS</td>
<td>Permanent Secretary</td>
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<td>RIA</td>
<td>Rapid Institutional Assessment</td>
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<td>SAGAs</td>
<td>Semi-Autonomous Government Agencies</td>
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<td>SMCs</td>
<td>School Management Committees</td>
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<td>SMS</td>
<td>Short Messaging System</td>
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<td>TTCs</td>
<td>Teacher Training Colleges</td>
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<td>TIVET</td>
<td>Technical, Industrial, Vocational and Education in Kenya</td>
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<tr>
<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organisation</td>
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<td>USAID</td>
<td>United States Agency for International Development</td>
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<tr>
<td>VVOB</td>
<td>Vlaamse Vereniging voor Ontwikkelingsamenwerking en Technische Bijstand (Flemish Association for Development Cooperation and Technical Assistance)</td>
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<tr>
<td>WAN</td>
<td>Wide Area Network</td>
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<td>YEF</td>
<td>Youth Enterprise Fund</td>
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1 EXECUTIVE SUMMARY

The Global e-Schools and Communities Initiative (GeSCI) is a global organization offering strategic advice to Ministries of Education in developing countries on the effective use of ICTs for Education. GeSCI is not a funding or implementing agency; rather it is a technical assistance and capacity building organization. Its work focuses on a) assisting countries develop comprehensive frameworks, policies and strategies; b) assisting the government convene, align and coordinate stakeholders; c) providing technical and strategic advice in the deployment and integration of ICTs in Education and d) building the capacity of the relevant government agencies and other stakeholders to enable them effectively acquire, deploy and manage ICTs for Education.

In GeSCI’s new strategic phase (2009 – 2011) it intends to engage with more countries and Kenya, among other countries, has been identified as a possible country to engage with. Before GeSCI can engage with any country, it carries out a detailed situational analysis and based on this develops an engagement strategy in consultation with the country. The situational analysis is meant to develop a general understanding of the main education issues, determine the country’s interest in using ICTs for Education, determine progress made in deploying and using ICTs in the Education sector, identify key challenges in using ICTs in the Education sector and determine if there is a role for GeSCI to play.

The situational analysis for Kenya was carried out between April and mid September 2009 using three broad processes: i) a desk study of relevant government documents; ii) a country visit, which took place from 14-17 April 2009, during which interviews, meetings and focus group discussions were held with key stakeholders (Ministries responsible for education and training and their agencies, other government agencies in charge of ICTs, educational institutions and Development Partners) involved in ICT in education initiatives, and a Round Table meeting of stakeholders met on 24 April 2009 during which the preliminary findings of the country visit were presented and validated.

Historically Kenya has always prioritized education and training at all levels as it is considered the foundation for social and economic development. The goal of education and training is to build the human resources necessary for national development and wealth creation. However, the government is faced with many challenges in realizing this goal; challenges which may be broadly categorized under the banners of access, quality, equity and relevance. Despite having made tremendous progress in providing access to education to more Kenyans through free primary (started in 2003) and secondary education (started in 2008), access continues to remain a challenge with still almost 1 million children not enrolled in formal schools, with less than 50% of eligible children attending secondary school, and with a university Gross Enrolment Ratio (GER) of 3% which is less than the African average. Maintaining and improving quality in a rapidly expanding sector pose considerable challenges. Most institutions are not equipped to handle the substantial increase in enrolments in terms of physical space, teachers (shortages and inadequate preparation) and instructional materials and equipment. Other factors cited as impinging on quality are overloaded curricula, poor resource management
in institutions and inadequate quality assurance mechanisms. Inequities and regional disparities remain despite the huge increase in enrolments. Overstretched facilities and high student: teacher ratios result in “inequity in quality”, especially in urban slums, rural and Arid and Semi-Arid Land (ASAL) areas. For education to be relevant it must fulfil societal expectations in preparing citizens with the required knowledge, skills, attitudes and values appropriate for a modernized and globalized world. Outdated and inappropriate methodologies and the mismatch between what is taught at institutions and what the economy and society demand, are cited as the main factors hampering relevance.

The 3 central government Ministries responsible for the education and training sector i.e. Ministry of Education (MoE), Ministry of Higher Education, Science and Technology (MHEST) and Ministry of Youth Affairs and Sports (MOYAS) each with their own distinct mandates and roles and responsibilities, have devoted considerable effort to addressing the major challenges facing the sector. Nevertheless, the education and training sector requires more support, fresh approaches and creative solutions to effectively deal with the complex challenges.

The government is well aware of the potential of Information and Communication Technologies (ICTs) to help address some of these challenges and of ICTs broader roles in human development and in the development of a knowledge-based economy. This is clear from official statements and documents such as the national plans (Kenya Vision 2030, Poverty Reduction Strategy, and National ICT4D Policy) and education sector plans and policies (KESSP, Sessional Paper No. 1 of 2005, National ICT Strategy for Education and Training) which all emphasize the role of ICT in education and national development. The situational analysis confirms that there is evident interest and concerted effort on the part of the government, the Ministries responsible for education and training, and development partners to use ICTs to tackle the complex challenges faced by the sector. As a result the education sector receives considerable support from development partners and civil society for some of their ICT initiatives. All ministries have budget line items which facilitate ICTs across the departments. There are several ICT initiatives by government ministries, development partners and other stakeholders underway and the MoE is supported by several groups in the implementation of these initiatives, e.g. the ICT Global Development Alliance, the ICT Integration Team, the ICT Trust Fund and a number of private partners such as Microsoft, Intel and Cisco as well as NGOs such as NICE and CFSK.

While the initial efforts to introduce ICTs in education were aimed primarily at developing ICT skills, the focus has over time shifted to leverage ICTs to address issues of quality and to improve teaching and learning. Digitization of the curriculum is underway by the Kenya Institute of Education (KIE). The content for primary school (standard 4, 5 & 6) and Secondary (Form 1) is complete. Digitization of the Form 2 curriculum is on-going. Teacher training programmes to equip teachers with ICT skills have been developed mostly by development partners and private ICT companies. ICT integration at Primary Teacher Training Colleges (PTTCs) is supported by a USAID funded project. Government is also providing some funding for ICTs to the TIVET
sector. Through its Digital Villages project the Ministry of Youth Affairs and Sports provides computer workstations and training in entrepreneurship to unemployed young people.

The priority for utilizing ICTs in Education seems to be at the secondary and post secondary levels including universities and TIVET institutions. ICT deployment at primary schools is considered “almost negligible.” Despite the evident interest and commitment, the availability and use of ICTs at various levels is still patchy. About 1,300 secondary schools (out of more than 6,000) have computers although other reports suggest that “most” secondary schools have some form of ICT. Of those with computers, 213 schools received the equipment from the Ministry of Education and the rest from private and civil society organizations. Most secondary schools are also reported to use less than 40% of the available infrastructure and very few actually use ICT as an alternative method for the delivery of the curriculum. According to prior analytical reports like the ICT in Education Options Paper and our findings, this state of affairs can be attributed to inadequate ICT equipment, lack of content, lack of guidance on how best to leverage the existing infrastructure, lack of curriculum support for the use of ICTs and lack of maintenance and technical support structures to keep the existing infrastructure operational.

The TIVET sector seems to be particularly under resourced compared to the secondary and university levels. During the interviews with TIVET officials it emerged that the state of ICTs in different TIVET institutions was very varied. However, there has not been any baseline study conducted to ascertain what is available in the field. While some government funding for ICTs has been provided, guidelines on the use of these funds were still under development. According to the interviews, there is an urgent need for an ICT integration roadmap without which coordination and tracking of activities will be difficult. It was reported that the trend of ICT use has been noted to start in administration, followed by ICT literacy classes and the introduction of ICT based courses through the national TIVET curriculum. These courses are also made available to the general public as a way of raising income in the institutions. However, findings indicate that ICT integration in teaching and learning has not been initiated. The primary reasons for this situation were noted as lack of awareness, understanding, requisite skills and institutional or sectoral policies that would support the integration of ICTs in education either at the institutional level or national level. It was reported during interviews and discussions that the current curriculum for TIVET institutions does not support ICT integration.

Universities are one of the main avenues for developing the IT workforce and professionals for the knowledge economy. A review of the strategic plans of all universities during the e-readiness study by KENET indicates that there is no explicit reference to developing the workforce for the emerging economy as exemplified in a lack of strategies to increase internal e-readiness on the campuses. The same e-readiness report indicates that even if the national information infrastructure is extended to all institutions and the prices are reduced dramatically, the higher education institutions were not ready to effectively use ICT.
The successful deployment of ICTs, especially the newer technologies like computers, requires good national electricity and telecommunications infrastructure. Over the last few years there have been huge investments in ICT infrastructure and a massive increase in mobile telephony usage. However, internet and broadband penetration levels remain low and ICT infrastructure and electricity supply, particularly in rural areas, remain a major constraint. In such an environment it is clear that new approaches and innovative strategies are required to overcome the challenges for the successful integration and use of ICTs in the sector.

The gaps in implementation and challenges facing the education and training sector in its efforts to use and integrate ICTs are summarized under three broad categories below.

**Challenges related to and gaps planning and deployment**

- Unified framework and strategy for whole sector: While the MoE has developed policy and strategy frameworks, the MHEST and MOYAS have not yet developed any policies and strategies for ICTs in Education. Further, there is no unified strategy for the whole sector. This leads to poor coordination among sector ministries and institutions, potential duplication of resources which can lead to unnecessary wastage, limited sharing of expertise, experiences and infrastructure especially in deprived areas and inability for the sector Ministries and institutions to leverage the work and strengths of others. This is in view of the fact that each system of education leads into the other and the skills accumulated at one level of education could provide gains in the next level. A harmonized strategy and implementation framework would accelerate progress, complement other initiatives and maximise impact.

- There is no readily available baseline data on the e-readiness of schools and TIVET institutions. This limits the ability of the Ministries responsible to plan for ICT deployment and integration.

- There is no strategy to explore alternate affordable solutions. In a situation where computer equipment is costly and electricity and connectivity coverage is limited, it would be prudent to explore all available ICT options to determine the most feasible options to meeting the educational objectives set. There is a need to compare and contrast different ICT and deployment options based on educational objectives.

- Guidance and support to educational institutions. Research shows that institutions with ICT plans and targets are more likely to effectively use ICTs. While some guidelines have been developed for schools, these have not been implemented yet. The other institutions would also benefit from guidance and support if the Ministries responsible provided clear policy, strategy and implementation guidelines. Even simple guidelines like standards are critical. In the absence of uniform standards and specifications institutions may acquire sub-standard /unfit for use equipment.
• Limited monitoring and evaluation (M&E) of ICT in Education initiatives which hampers ability to determine if ICTs are playing a useful role and to adjust strategy accordingly

• Poor and limited connectivity at educational institutions: Institutions are unable to take advantage of the Internet for communication, collaboration and extensive free resources. This to some extent hinders the ability to use computers and other interactive ICTs to enrich teaching and learning processes and for acquisition of higher order skills required for 21st century learning. New developments (e.g. fibre optic cables) and technologies (e.g. 3G connectivity) provide opportunities for alternative and more cost-effective solutions to be harnessed.

• Limited availability of grid electricity especially in the rural areas means that institutions in these areas are unable to use ICT without a large investment in alternative power systems. Coordinated planning with REA and other government agencies would be tremendously helpful to the institutions as the power grid is sometimes on the institutions’ doorstep or close by.

• Comprehensive maintenance and support strategy: the national and regional structures for maintenance and support proposed in ICT4E strategy have not been implemented. Without regular maintenance and technical support systems, institutions experience long downtimes for ICTs equipment. This can lead to teacher and student frustration and/or demotivation in using ICTs and ultimately a wasted investment in ICTs. This is one of the main reasons why ICTs are not currently optimally used. It is estimated that 60% of ICTs in schools are not being used. Mechanisms to support maintenance and to provide technical support especially at rural institutions must be developed and necessary funds allocated for that. Integrated planning in the sector could lead to potential leverage of TIVET institutions, including Youth Polytechnics to provide maintenance and technical support in rural areas.

Challenges related to and gaps in integration
There is a general issue around the world where integration is often interpreted as classroom integration. However, ICTs can play a much larger role if used to address access and equity issues and management inefficiencies within the system. The MoE policies and strategy certainly recognize this although focus is still on classroom integration and ICT skills. The other sectors have not articulated any strategy nor are there signs that ICTs are being used to address these challenges such as access which is even more critical at the post secondary level. On the whole, the major deployment approach is the computer lab model which limits ICT use primarily to skills training. Without educational objectives driving the deployment models ICT resources would not be used optimally.

ICT integration into classroom practice
• Teacher Professional Development (TPD): There is no baseline data on teacher ICT competencies. There is also no coordinated and comprehensive competency
framework for TPD with regard to ICT integration and use. Planning for TPD in ICT without baseline data is problematic. The lack of a competency framework can lead to external partners determining what teachers should learn and how. Ultimately without comprehensive, appropriate and timely training teachers will be unable to use ICTs to improve their teaching and student learning. ICTs in institutions will not be used appropriately/optimally leading to a wasted investment in ICTs. Further, there is lack of strategy to use ICTs as tools in continuous professional development (e.g. through e-learning and on-line modalities).

- Content: While efforts are underway to develop content starting with TTCs, content for secondary and primary schools is under development with completion having taken place for certain classes in primary and secondary level. However, with the few number of schools that are equipped with computers (1,300 out of more than 6,000), access and equity issues would remain. TIVET and other sectors are entirely lacking any content.

- Curriculum: There are no frameworks in place to guide the integration of ICTs into teaching and learning and the curriculum in its entirety has not been reviewed. Without review and overhaul of curriculum to integrate ICTs, ICT integration will only be an “add-on” and not have the desired transformational impact.

ICTs for management
- There is limited use of ICTs for administration and management and a limited ability to leverage ICTs to facilitate management of decentralized structures and to improve efficiency of system. While there is an EMIS system for the MoE, the lack of administrative frameworks to support effective implementation and coordination of EMIS components could curtail the MoE’s ability to maximally leverage these EMIS tools.

- Although technologies are available, the power and potential of ICT tools for management, data collection and decision making are not harnessed for planning, project management and capacity building.

ICTs for access and equity
Some of the universities have taken steps to start using ICTs for distance learning. However, these efforts are at the nascent stage and still very limited and uncoordinated yet ICTs have high potential in this area. This limited application of ICTs to address challenges related to access and equity may be attributed to: lack of clear policies and strategies for open and distance education, limited understanding and awareness of alternative delivery systems and options and the enormous investments required for appropriate models of ICT integration for increasing access.

Capacity constraints within the Ministries
- Staffing: All Ministries have dedicated ICT staff (seconded by the Directorate of e-Government), with the MoE planning on a dedicated unit for ICTs in education. The Directorate of Technical Education under the MHEST has two staff members
dedicated to ICT in Education. The MOYAS has only the ICT staff from e-government. However, the ICT staff are all IT professionals whose primary responsibility is the internal ICT and e-management systems of the Ministries. The skills required to manage, support, integrate and implement ICTs in Education are more closely related to education and technology use in education than purely ICT infrastructure and systems. It is clear that the skills and experiences in the areas of educational technology, ICT policy formulation and planning, e-learning, TPD using ICTs and digital content creation are lacking within the Ministries. As a result, critical areas in ICT integration are not attended to or insufficiently attended to, causing skewed development. Without education experts (with ICT and ICT integration knowledge and experience) in charge, ICT in Education initiatives are likely to be technology driven rather being leveraged as tools to address specific education challenges. The MoE is the only Ministry actively addressing this issue with the creation of the ICT integration committee.

- Organizational structures: Findings indicate that ICT in MoE is divided into three pillars: ICT for administration and management (Technical), EMIS and ICT for education (e-Learning/e-education). It appears from amongst the Ministries in the sector as if MoE and MHEST have intentions of following what is considered to be good practice (UNESCO Bangkok, 2004; Canadian Education Association; undated; Twinomugisha; undated) in having one unit consisting of ICT functions and another for ICT in education functions\(^1\). In addition, a cross-divisional or cross-institutional “steering” or integration committee should be in place to oversee the implementation of the policy and strategy. However, the mandates and responsibilities of the ICT and ICT in Education units (under formation) should be clarified in well stipulated roles and responsibilities to avoid duplication/overlap of functions which can in turn cause confusion, inhibit progress and create conflict.

- Financial resources: While ICTs are an investment pillar in their own right within the KESSP, there is no dedicated budget vote heads for ICT integration within the various Ministries. This leads to under-funding of ICT4E activities and a heavy reliance on partners for deployment and integration. Reliance on partners for acquisition of equipment and ICT4E initiatives has implications for sustainability. There is an Investment Programme (IP) under KESSP I for ICT Integration, curriculum and Programmes under TIVET. Although there is funding for ICT integration it was noted that the definition for integration may largely translate to the purchase and acquisition of computers.

- Processes and programme management: there are no established processes and systems to support programme management for ICTs in Education. Such processes

[http://www.cea-ace.ca/media/en/Trends_ICT_Integration.pdf](http://www.cea-ace.ca/media/en/Trends_ICT_Integration.pdf);
and systems should ideally include planning systems, decision making frameworks, knowledge management systems and monitoring and evaluation.

The Situational Analysis concludes that 1) there is potential for GeSCI to engage the education and training sector in a mutually beneficial way; 2) that the time is right for a GeSCI engagement as evidenced by the ongoing reforms in the sector, the review of KESSP I in which ICTs form one of the priority pillars of the sector strategy, and interest shown by ministries and their related institutions in utilizing ICTs and in what GeSCI could offer in this regard; and 3) that there is interest from various government ministries to work with GeSCI in furthering their ICT in Education objectives.
2 INTRODUCTION AND BACKGROUND

The Global e-Schools and Communities Initiative (GeSCI) was founded by the United Nations ICT Task Force in 2004. GeSCI is legally a not-for-profit organization headquartered in Dublin, Ireland and has recently established a Regional Office in Nairobi, Kenya to oversee and support its work throughout Africa.

GeSCI’s aim and mission is to work with, empower and build the strategic capacity of Ministries of Education and other government departments to effectively and efficiently plan for, deploy and integrate ICTs in their education systems. Most of GeSCI’s work focuses on providing expert strategic advice to senior policy and decision makers on policy development and strategic planning and strengthening the institutional capacity of key government institutions to plan and implement ICT in Education programmes within a wider framework of developing knowledge economies and societies.

In GeSCI’s new strategic phase (2009 -2011) it intends to engage with more countries and Kenya, among other short listed countries, has been identified as a possible country to engage with in a more systematic and comprehensive manner. Before engaging with any country, GeSCI undertakes a comprehensive Situational Analysis.

2.1 How GeSCI works with countries

The successful use and integration of ICTs within the education sector for many developing countries will require funding, access to technology, expertise, knowledge and human capacities; resources and capacities that are often lacking. To-date, donors and national governments have provided funds, private sector companies have provided access to technologies and efficient business processes and NGOs have provided funds, equipment and training opportunities. However, the efforts aimed at the development of polices and strategies, sustained knowledge, building of expertise and capacities and the provision of knowledge support, which are critical for building sustained local capacity in developing countries to successfully exploit ICTs for education have been inadequate.

GeSCI’s work focuses on addressing these inadequacies: assisting countries develop effective and responsive policies, building strategic capacities, creating and sharing knowledge, promoting shared learning, fostering strategic multi-stakeholder partnerships and empowering developing countries. This ensures that ICTs are cost-effectively acquired, effectively deployed and holistically integrated into education systems. This is the basis for GeSCI’s founding in 2003 by the UN ICT Task Force and the basis for its operations and mission today.

In order to achieve its goal and successfully carry out the envisioned activities, GeSCI works with and cooperates with all of the appropriate strategic partners: the developing country government and its ministries and agencies, its own donors and other development partners and other expert organisations at the local, regional and global level. GeSCI’s operations and partnerships are based on the idea of Knowledge Building and Sharing – support that helps developing countries to build their own knowledge and innovation institutions, structures, strategies and policies. GeSCI also
encourages ministries in charge of the education sector to adopt a system-wide approach
to ICTs in education so that the focus is not solely on the deployment of ICT equipment
but also on education policy; teaching practice and pedagogy; teacher professional
development; curriculum; assessment; administrative and management processes, and
monitoring and evaluation.

2.1.1 What GeSCI provides
GeSCI is not a funding or implementing agency. It is a technical assistance organization.
In practical terms, GeSCI provides countries with:
   a) Experts and specialists in the various facets of ICTs in Education;
   b) Access to knowledge and tools on the effective use of ICTs in Education
   c) Capacity building of the countries’ policy and decision makers and
      implementation managers in the area of ICTs and Education.
   d) Potential to build more regional and global partnerships.

GeSCI’s work usually culminates in one or all of the following: ICT in Education policies and strategic plans; deployment or action plans; institutional and staffing changes; budgets and resource plans; partnerships forged and the successful deployment and integration of ICTs.

2.1.2 Capacity building strategy
Most of GeSCI’s work revolves around building capacity: both at the individual and
organization level. GeSCI also engages the development partners in a country to
influence the supporting external environment and to make it more conducive. Capacity
is built through:
   • Day to day interaction with relevant government officials (usually at the
     management and decision making level) providing advice, sharing and
     exchanging experiences, knowledge and the latest research.
   • Facilitating brainstorming sessions during which participants are encouraged to
     critically analyze problems, challenge assumptions and devise solutions based on
     the local context.
   • Training and awareness building workshops targeting general or specific
     knowledge and skills gaps
   • Facilitating peer-to-peer learning exchanges with other countries.
   • Providing support for attendance at conferences and other workshops around the
     world deemed important to the individual or ministries work.

2.1.3 Programme design and execution
GeSCI programmes are generally 3-5 years duration and follow a typical life-cycle with 5
key stages. During the country selection and preparation phase, GeSCI’s key partners are
the Ministries responsible for education and the local Donor Coordination Group.
Harmonization and alignment with existing government development polices and
strategies and country ownership of the ICT in Education agenda are a guiding principle
in our work. Engagement with these key partners is ongoing throughout all programmes.
Countries to be considered: GeSCI has developed a number of mandatory and desirable criteria for assessing suitable countries for its assistance. The overall objective is to ensure that GeSCI can have an impact. The country preparation process is managed through the Africa Regional Programme and the focus is in Sub-Saharan Africa. To start, countries are selected based on four key criteria:

- Must be a developing country with special preference for sub-Saharan Africa
- Country’s PRSPs and Education strategies must prioritise ICTs
- Demand from and commitment of the government and MoE – through a request for GeSCI’s assistance and willingness to sign an MoU with GeSCI
- Must be a priority country for GeSCI’s Donors or there must be local donor interest to support GeSCI’s work.

Preparation and approval: GeSCI’s preparation and planning phase follows a participatory and consultative process that ensures country ownership of the ICT4E agenda. The process involves a stakeholder analysis, situational analysis (problem identification and situation appraisal) and the development of strategies and activities to address the problems in close consultation with all stakeholders (usually government agencies and donors and in some cases civil society and private sector). All new country programmes require GeSCI’s Board approval.

Engagement phase: A Memorandum of understanding (MoU) is signed with the MoE detailing goals, outputs, activities, timelines, roles and responsibilities for the programme. GeSCI staff work directly in the Ministry or Ministries responsible for the education sector or with an identified strategic partner. Programme management relies on a results-based approach and progress is monitored through joint (Ministries and GeSCI) work-plans, regular reporting and internal reviews throughout the life of the engagement phase. The programme management approach is designed to promote joint decision making.

Completion and evaluation: At the end of the MoU period, GeSCI conducts an internal review in close consultation with the Ministry or Ministries responsible for the education sector and commissions an external independent evaluation of the programme.

Post-engagement: A key lesson learned by GeSCI is that the period after completion of a country engagement is critical to ensure the sustainability of GeSCI’s intervention. The post-engagement can also lead to a new country programme, if recommended by the evaluation and required by the MOU and funding agencies. The post-engagement phase of our African country programmes is managed through the Africa Regional Programme.

Kenya meets all of the criteria for engagement outlined above. However, Kenya has other attractions for GeSCI’s engagement, the primary two being:

1) GeSCI is well-positioned for engaging with the Kenyan education and training sector as its Africa Regional Office is based in Nairobi and
2) GeSCI is already familiar with many aspects of the education sector and ICT landscape as a result of its support to the strategic planning process for the establishment of the Kenya e-Learning Centre (KeLC) during 2007 and 2008.

The GeSCI Africa Director and Regional Specialist for e-Learning met with the Senior Deputy Secretary of the MoE on 19 March 2009. At this meeting it was established that there was interest in what GeSCI could offer the Kenyan education sector in terms of its services and products. As a result GeSCI embarked on this situational analysis.

### 2.2 Purpose and Scope of Situational Analysis

Once countries are short-listed, based on the criteria in 2.1 above, GeSCI undertakes a number of studies to ascertain and confirm that the countries fully meet the criteria and to understand the ICT and Education situation on the ground to determine if and how GeSCI should engage with the government and education sector. By understanding the situation on the ground, GeSCI is able to craft an appropriate strategy for engaging and working with the country. This is important as GeSCI’s work is demand-driven and is based on the government’s own priorities and strategies.

The scope of the situational analysis covers:

- Structure of education system with key statistics
- Organization, staffing, responsibilities/coordination, management and reporting structure of the MoE (including degree of centralization or decentralization);
- Major education objectives and priorities (including major reforms underway)
- Major challenges in the education sector
- How ICTs are situated in the education policy/strategy
- Existing ICT4E initiatives (both government and non-government), status, challenges and benefits of such initiatives
- Stakeholder analysis- identify main agents for implementation/ change of ICT4E; beneficiaries (who will benefit) and victims (who stand to lose or be negatively impacted)
- Initial analysis and conclusion on:
  - Readiness of country to utilize GeSCI services and products
  - Potential of GeSCI to make an impact

### 2.3 Methodology

In assessing the current ICT in Education situation, GeSCI relied on three primary processes:

- A desk study of relevant documents (March - September 2009)
- Meetings and interviews with key government ministries and departments, institutions, agencies and development partners (April- September 2009).
- Round table meeting (24 April 2009) with partners met with and interviewed to share and verify findings. See Annex 5 for summary of round table meeting.
2.4 Assumptions and Limitations

The analysis initially focused on ICT in Education initiatives in the Ministry of Education, but had to be broadened to include the Ministries of Higher Education Science and Technology and the Ministry of Youth Affairs and Sports to cover the education and training sector. Since not all processes and activities in the ministries are documented and the results of the baseline on the state of ICTs in Education in the MoE were not available, it was difficult to obtain information on particular aspects related to the integration of ICTs. In addition many of the existing documents are not available on-line and the different sources often provided differing information, especially in the case of statistics, which made analysis difficult. It was challenging to verify data and interpretations of the data with officials as often responses were delayed as a result of busy schedules. Recent changes in the configuration of ministries (e.g. MHEST) have also caused some ambiguity about programmes and activities which made verification and analysis more challenging.

2.5 Previous GeSCI work in Kenya

After the international e-Learning Africa (eLA) Conference in Nairobi in May 2007, the e-Government Directorate organized an e-learning roundtable at which public, private and civil society sectors were represented. The participants at the roundtable indicated a need for a mechanism to promote sharing of information and resources and coordination of e-learning developments. GeSCI was approached by the e-Government Directorate to assist in this regard, resulting in a Memorandum of Understanding (MoU) between GeSCI and the Directorate of e-Government (DEG) for GeSCI to support the strategic planning process for the establishment of the Kenya e-Learning Centre (KeLC). A Rapid Institutional Assessment (RIA) of twenty-three (23) institutions, among them government departments/units, universities, various institutes, training and learning centres, a private sector company, and entities like the Kenya ICT Board, Communications Commission of Kenya and Digital Village Initiative, was carried out in September 2007 to identify the state of play among a number of key institutions in the ICT and e-learning landscape. The assessment indicated that ICT and e-learning development in Kenya was at a particularly dynamic stage which presented both opportunities and challenges to the Kenyan government.

Various demands were identified during the RIA, the major ones being the lack of coordination, lack of capacity and lack of adequate connectivity and infrastructure across sectors and institutions engaged in ICT integration.
3 OVERVIEW OF KENYA AND ICTS IN KENYA

This section briefly presents an overview of Kenya and the state of ICTs at the national level to provide the general context.

3.1 Overview of Kenya

Kenya is on the East African coast occupying 569,250 sq km with a population in 2007 of over 37 million and an annual population growth rate of 2.6%. UNESCO reports further indicate that of the total population, 60% are youth under the age of 30 years. The World Bank Development Indicators (2006) show the rural population at 79% and life expectancy at birth at 53 years. The literacy rate in 2007 stood at 78.1%. The main languages spoken are English, Kiswahili and numerous local languages. English is the official language and Kiswahili is the national language. Kenya is divided into 8 administrative units known as provinces, namely Central, Coast, Eastern, Nairobi, North Eastern, Nyanza, Rift Valley and Western. Each Province is divided into districts that are further divided into divisions and zones.

Kenya is considered to be the leading economy in East Africa and described by some sources as a “linchpin country for the growth and stability of the entire region.” It is a major economic, financial, communication, and transportation centre in Eastern Africa. Its strategic location and its well developed business infrastructure has made it a natural choice for investors and many international private and NGO firms have made it their regional hub. The mainstay of the economy is the agricultural industry, forming one-third of the Gross Domestic Product (GDP). Tourism is another significant contributor to employment, income and foreign exchange. Manufacturing and processing, especially of agricultural products, is also a large employment sector, as is the service industry.

The 2008 World Bank figures indicate that between 2005 and 2007 the economic growth increased from 5.5% to 6.5% (and even higher according to other sources, e.g. Ministry of Finance, Kenya) after years of economic decline in the 1980s and 1990s ("Kenya - Data and Statistics," 2008). The GDP growth in 2006 was estimated at 6.1%. Since 2003 to 2007 ‘The Economic Recovery Strategy for Wealth and Employment Creation’ brought about structural reforms and focused implementation leading to steady expansion of the economy from “virtual stagnation of 0.5 percent in 2002 to a high of 7.1 percent in 2007.” However, the gains were reversed through the global economic recession in late 2008, sharp increases of oil and fertilizer in international markets and drought conditions

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3 Source: UIS Statistics in Brief (2007)
4 http://education.nairobi-unesco.org/PDFs/UNESS%20FactBk.pdf
5 Kenya Country Profile; http://www.usaig.gov/locations/sub-saharan_africa/countries/kenya/kenya_profile.pdf
in certain parts of Kenya. There has been a modest recovery of the economy in 2009 with the national economy growing by 3 percent. The focus of the 2009 National Budget is to ‘stimulate growth and protect jobs, reduce poverty, enhance food security, and protect the poor.” (Budget Speech, 2009, p. 4).

### 3.2 National ICT infrastructure

Over the last few years there has been massive investment in infrastructure, both undersea and terrestrial cables, including computerization of all government departments and processes. According to the Communications Commission of Kenya (CCK), the government reduced the import duty on both mobile telecommunications terminals and computers in 2005.

#### 3.2.1 Key indicators

The following are the ICT Indicators for main telephone lines, internet and mobile cellular subscriptions in 2008 as obtained from CCK.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Sept 08</th>
<th>Dec 08</th>
<th>2007 to 2008 increase rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile phones subscribers</td>
<td>14,503,964</td>
<td>16,233,833</td>
<td>11.9%</td>
</tr>
<tr>
<td>Mobile phone operators</td>
<td>4</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Mobile population coverage</td>
<td>83%</td>
<td>83%</td>
<td>0</td>
</tr>
<tr>
<td>Mobile land coverage</td>
<td>31%</td>
<td>32%</td>
<td>1%</td>
</tr>
<tr>
<td>Fixed line telephony</td>
<td>252,882</td>
<td>252,296</td>
<td>-0.91%</td>
</tr>
<tr>
<td>Local Loop subscribers</td>
<td>9,918</td>
<td>9,908</td>
<td>-0.10%</td>
</tr>
<tr>
<td>Internet users</td>
<td>3,043,442</td>
<td>3,359,552</td>
<td>10.4%</td>
</tr>
<tr>
<td>Operational Internet Service Providers</td>
<td>*N/A</td>
<td>50</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*Table 1- Statistics on Telephone Internet and Mobile Cellular Subscriptions*
*N/A- data not available*

Among telecommunication services, the internet has been among the least accessible service in the country. The internet penetration rate was quoted at 9%. This according to findings was attributed to the lack of infrastructure and relevant content. It is hoped that the operationalization of the National Fibber Optical Cable and the Unified Licensing Framework will boost internet penetration and stimulate growth in this sub sector.

Growth in the telecommunication sector and especially in mobile telephony has been attributed to competition among operators, unification of licenses and the application of new technologies in the mobile market, reduced tariff rates and increased affordability of communication services by a larger section of the population.

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3.2.2 Regulatory status and the National Optical Fibre Backbone Infrastructure

Kenya’s telecommunication market began full liberalization in 1999 when policy and regulatory functions were de-linked from mainstream operation. As a result the Communication Commission of Kenya (CCK), an independent regulatory authority and the National Communications Secretariat (NCS), a policy advisory arm, were created.

Findings as per interviews with CCK indicate that, in 2008, the Commission introduced a technologically-neutral Unified Licensing Framework (ULF) which is geared towards removing bias to technology as was earlier the case, increasing investor choices and removing the regulatory burden from the Commission. This was followed by the enactment and further ascension into law of a new Kenya Communications Act in 2009 which gives a further mandate to the Commission of regulating broadcasting and e-transactions.

During the interviews, it was further confirmed that two submarine landing companies (M/s Teams Limited and Seacom Limited) have been licensed. Meanwhile, the government through the Commission has been laying down the National Optical Fibre Backbone Infrastructure (NOFBI) throughout the country with connection points in bordering countries. The initial plan is for NOFBI to connect all district headquarters in the country with plans to extend this to more rural areas.

The recent establishment of the Government Core-Connectivity Network (GCCN) increases the potential of government in sharing key infrastructure investments such as bandwidth and data centres. It was reported that GCCN will also be connected to NOFBI.

It was noted that the regulatory environment in Kenya is no longer a bottleneck to investment but rather a facilitator and promoter of local and foreign investments.
4 STATE OF EDUCATION AND TRAINING SECTOR

The country’s development plan is premised on achieving three objectives:
- To ensure and stimulate sustained economic growth
- To improve equity and reduce poverty and
- To enhance governance.

Education and training, as part of the wider human resource development strategy, lie at the heart of tackling inequality and reducing poverty. Education is seen as the core strategy for building human resources necessary for employment and wealth creation.

4.1 Education Policies and Strategies

In order for the Government to achieve the vision of “Quality Education and Training for Development”, the MoE and its stakeholders developed Sessional Paper No. 1 of 2005 as a policy blueprint. This paper stipulates the policies and strategies the government will undertake in order to address the challenges facing education and training. Challenges in education are related to access, equity, quality, relevance, efficiency in management of educational resources, high cost of education, gender and regional disparities, teacher quality and utilization. These challenges have been analyzed and incorporated into 24 different components under the Kenya Education Sector Support Programme (KESSP).

KESSP has been developed in order to enable the government to achieve the vision for education and training with the following targets:
- Attain UPE by 2005 and EFA by 2015
- Achieve a transition rate of 70% from primary to secondary
- Enhance access, equity and quality in primary and secondary education through training of education managers
- Construct and renovate physical facilities in public learning institutions especially in disadvantaged areas
- Develop a national training strategy for TIVET (by 2005) and ensure that TIVET institutions are appropriately funded and equipped
- Achieve 50% improvement levels of adult literacy by 2010
- Expand university education and special emphasis to science study and the girl child.

4.2 Educational philosophy

The education and training sectors are guided by the philosophy of “Education and Training for Social Cohesion as well as Human and Economic Development”. This philosophy is in turn underpinned by the following principles:
- National unity and unity of purpose
- Social responsibility
- Moral and ethical values

10 http://www.un-kenya.org/ThemeGroups/SessionalPaperFinaljan.doc
- Lifelong learning which is seen to be critical to effective social and economic development. Access to information and knowledge is seen to be an essential prerequisite of learning.
- Science and technology as it relates to innovation, research, development, and ICT will form the key pillars of education and training.
- Equity which includes equal opportunities for all in terms of access, retention, and completion.
- Quality to compete favourably with international standards
- Sustainability as education should empower Kenyans to conserve, sustain and exploit the environment for sustainable development.

4.3 Education objectives and targets

The specific objectives and the targets set for the education and training sector as set in the Sessional paper No. 1 (2005) for the education and training sector are summarized in the table below:

<table>
<thead>
<tr>
<th>Goals</th>
<th>Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure that all children have access to and complete free and compulsory primary education by 2010</td>
<td>Attain UPE by 2005 and EFA by 2015</td>
</tr>
<tr>
<td>Enhance access, equity and quality at all levels of education by 2010</td>
<td>Achieve transition rate of 70% from primary to secondary by 2008</td>
</tr>
<tr>
<td>Improve the quality of all aspects of education and training by 2010</td>
<td>Enhance access, equity and quality through capacity building for 45,000 education managers by 2005</td>
</tr>
<tr>
<td>Ensure that the learning needs of all are met through equitable access to appropriate learning materials and life skills programmes by 2015</td>
<td>Construct/renovate physical facilities/equipment in public learning institutions by 2008</td>
</tr>
<tr>
<td>Achieve adult literacy especially for women by 2015</td>
<td>Develop a national training strategy for TIVET in 2005 and ensure these institutions are appropriately funded and equipped by 2008</td>
</tr>
<tr>
<td>Promote and popularize ICT as well as science and technology education</td>
<td>Achieve 50% improvement of adult literacy by 2010</td>
</tr>
<tr>
<td>Promote and popularize Open and Distance Education at all levels of Education and training by 2010</td>
<td>Expand public universities to have a capacity of 5,000 students each by 2015</td>
</tr>
<tr>
<td>Improve the quality and relevance of teaching, learning and research at universities and TIVET institutions by 2010</td>
<td>Increase proportion of students studying science course to 50% with one third of these being women by 2010.</td>
</tr>
<tr>
<td>Ensure quality management capacities amongst education managers and other personnel involved in education by 2010.</td>
<td></td>
</tr>
</tbody>
</table>

Table 2- Education Objectives and Targets

The Situational Analysis, although not focused on assessing the results of the targets set, indicates that in many of these areas the education sector has not made the progress anticipated and would still have a way to go to attain the objectives. ICTs could be harnessed more creatively to enable the sector to achieve its objectives.
4.4 Structure of the education and training system

The formal education system in Kenya comprises of Early Childhood Education, 8 years of compulsory schooling in primary education, 4 years in secondary education and a minimum of four years in the University depending on the degree pursued. This is widely referred to as the 8-4-4 system which has been operational since 1985. Other education and training programmes include the Technical Industrial, Vocational and Entrepreneurship Training (TIVET), Special Needs Education, Adult and Non-formal Education\(^\text{11}\). Progression from primary to secondary school and from secondary to university is through selection on the basis of performance in the national examinations for the Kenya Certificate of Primary Education (KCPE) and the Kenya Certificate of Secondary Education (KCSE) respectively which are administered by the Kenya National Examinations Council. Figure 1 below is a graphical representation of how graduates at various levels of the education levels integrate both horizontally and vertically.

![Figure 1 - A Policy Framework for Education, Training and Research](http://www.ibe.unesco.org/National_Reports/ICE_2008/kenya_NR08.pdf)

\(^{11}\) http://www.ibe.unesco.org/National_Reports/ICE_2008/kenya_NR08.pdf
4.4.1 Early Childhood Education (ECE)
ECE, also known as pre-primary education, caters for children between 0-6 years and is largely provided by communities, individuals and local authorities. Though this is also considered to be part of the formal education system, it is not compulsory and many children are admitted to primary education without having attended pre-primary schools. Many children fail to attend early childhood education due to poverty and challenges in access. However, as reported in the UNESCO Factbook (2007), plans are under way to integrate ECE into the free primary education programme.

4.4.2 Primary Education
Primary Education in Kenya caters for children between 6 and 14 years of age. According to the figures obtained from the EMIS (MoE), there are 18,130 public, and 8,076 private primary schools with a total of 8.6 million children in 2009. There are 170,059 trained teachers in these schools with a student to teacher ratio of 44.7:1. The introduction of Free Primary Education (FPE) in January 2003 is considered a great achievement as it increased primary enrolment from 5.9 to 7.2 million in 2003. This number has continued to rise with a registered 8.6 million primary school enrolments in 2008.

4.4.3 Secondary Education
Secondary education in Kenya caters for 14-17 year olds. Whereas the distribution of primary schools in country has a wide coverage, as most of the primary schools accommodate day-schooling, secondary education is offered in far fewer schools with most of these being boarding schools. This has resulted in secondary schooling being much more expensive than primary schooling. According to findings during the interviews, this trend is being reversed and the number of day secondary schools is on the rise. The increase is being attributed to the expansion of access through the building of day schools with funding from the Constituency Development Fund (CDF). The CDF initiative was started in 2003 and provides a channel through which funds are released to each constituency by the government for development. The development activities are prioritized by the community. With the communities prioritizing education as a key development issue, the funds have been used extensively for construction of schools.

This trend in the increased access to secondary education has been noted in the last ten years. UNESCO\textsuperscript{12} reports that there were 3,684 public secondary schools in 2002. This increased to 4,245 in 2008 with approximately 1.18 million students. Figures obtained from EMIS (MoE) in 2009 indicate that public secondary schools have risen to 5,091 and 2,305 private secondary schools. These had 1.2 million and 0.17 million students respectively in 2009. In total there are about 1.38 million students in formal secondary education. The day schools have also proved favourable to parents who cannot afford boarding fees for their children.

\textsuperscript{12} \url{http://www.ibe.unesco.org/National_Reports/ICE_2008/kenya_NR08.pdf}
4.4.4 University Education

The university sector comprises of public universities that have been established by Acts of Parliament and private universities that require accreditation and charters granted by the Commission for Higher Education (CHE). The public universities are overseen by the Ministry of Higher Education, Science and Technology (MHEST). Though autonomous, public universities receive funding from the MHEST for development projects and salaries of staff who are government employees. The funds allocated to the public universities and their constituent colleges are provided after submission of proposals to the treasury every financial year. As reported by a senior officer in the MHEST, at the time of writing this report, there were 28 universities. Of these, 21 are private and 7 public. Eight of the 21 private universities are fully chartered and offer their own degrees while the others have letters of interim authority to offer degree courses. Besides the 7 public universities there are 12 university colleges which are run by the public universities. The 21 private universities were reported to have a total enrolment of 118,000 students.

Each public university is run by a University Council. The chair of the council is usually a presidential appointee. In every university council, there is a representative from the MHEST who ensures that the set government procedural requirements for carrying out activities are met and adhered to. It is also worth noting that although there is this level of accountability of the universities to the state, there is also a high degree of autonomy and public universities can generate income using their own innovative ways. They can also forge partnerships with development partners, the private sector, civil society and other universities from across the globe. The private universities do not receive any funding from the government but have to comply with and measure up to the standards as set out by the CHE. All the public universities have a Joint Admission Board (JAB) and needy students from the same universities receive loans and bursaries from the Higher Education Loans Board (HELB) under the MHEST.

Kenya was reported to have a Gross Enrolment ratio (GER) at tertiary level of about 3% which is below the average for sub-Saharan Africa of 5%.

4.4.5 TIVET

Vision 2030 places great emphasis on science, technology and innovation in general and TIVET in particular as the vehicle for socio-economic and technological transformation. Previously, the TIVET sector catered for primary and secondary graduates who for one reason or another dropped out of the formal education system at the primary or secondary levels and consequently did not transit to institutions of higher learning (universities). The current thinking, according to a senior official in the directorate is that TIVET institutions should be institutions of choice and not seen to be for those who may have failed in one way or another. This is one strategy of increasing access to education for the youth. Although TIVET institutions include National Polytechnics, Technical Teachers Colleges, Institutes of Technology, Technical Training Institutes, Industrial Training Centres, Youth Polytechnics, Vocational Training Centres and other private

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commercial colleges, the Directorate of Technical Education also oversees the Institutes of Technology, the Technical Training Institutes, the two National polytechnics and the Kenya Technical Teachers Training College (KTTC). An additional two polytechnics (Mombassa and Kenya Polytechnic) are still under the directorate although they are currently under the mentorship of Nairobi and Jomo Kenyatta Universities as constituent colleges. Until 2007, there were 4 national polytechnics. Two of these have recently been upgraded to university status and are set to offer degree courses in technological fields. Findings indicate that the African Development Bank (ADB) will be funding the upgrading of about 3 other institutions to university status. According to the interviews there are a total of up to 48 institutions under the MHEST and their numbers are on the rise especially with the current support from the ADB which is focusing on the creation of new TIVET institutions. Other institutions are being upgraded to Technical Training Institutions (TTI). Other technical training institutions which fall outside those discussed above are still categorized as TIVET institutions but are under other government ministries like Agriculture, Transport and Communication, Health, and Youth Affairs. It was reported that managing TIVET under various government departments leads to disparities in the training standards.

The training at TIVET institutions is offered at artisan, certificate and diploma levels in courses such as Construction, Engineering, Business Studies, Textiles, Agriculture and last up to three years. Those admitted in TIVET institutions are either primary school or secondary school graduates. The Youth Polytechnics cater for the primary graduates while the National Polytechnics, Institutes of Technology and Technical Training Institutes admit trainees with secondary level qualifications.

**4.4.6 Adult and Continuing Education**

Adult Education falls under the Ministry of Education in the Directorate of Adult Education. Historically Adult Education has been associated with elderly illiterate learners. This has rendered it a certain level of irrelevance to the younger generation, the public and government planning. There are however deliberate steps to change this perception and one of these was the relocation of Adult Education from the Ministry of Sports to the Ministry of Education in 2008.

According to the Kenya National Adult Literacy Survey Report (2007), 61.5% of those above 15 years of age have attained functional literacy levels leaving 38.5% of the Kenyan adult population illiterate. In this report, it is noted that only 29.6% of the adult population has achieved the mastery competency levels. The survey further established that 7.8 million Kenyans have not acquired minimum literacy levels.

**4.4.7 Non Formal Education**

Non-formal education is offered in Non Formal Schools (NFS) and Non Formal Education Centres (NFES). According to reports from EMIS (MoE) in 2009, there are 1,395 Non Formal Education institutions with a total enrolment of 180,900 learners. These have 3557 trained teachers and 6,688 untrained teachers. The student to teacher ratio is 18:1.
4.4.8 Teacher Education

Teacher education can be broadly categorized as in-service (INSET) and pre-service (PRESET).

Pre-Service
In teacher education, there are three main institutions involved in the pre-service preparation of teachers:

- Universities: The public and private universities offer Bachelor of Education degrees in Arts and Sciences as well as post-graduate training for secondary school teachers. During the 4-year training teachers are required to specialize in two subjects during pre-service which they can effectively teach once they are deployed in the schools. Student teachers are allowed to take ICT as one of their specialization subjects for teaching in secondary schools. However, ICT integration in the teaching process has not yet been implemented but there are discussions to have this started in the near future.

- Diploma Colleges: There are currently three diploma teacher training colleges for the training of non-graduate secondary school teachers. The student teachers are required to specialize in two subjects and the training takes two years during pre-service training.

- Teacher Training Colleges (TTCs): The pre-service training of teachers for primary school teachers takes place at TTCs. According to the Ministry of Education (2008) Kenya has 19 public primary teacher-training colleges and over 50 private teacher training colleges. Around 18,700 trainees graduate from public colleges every two years. Teachers from public TTCs are supposed to be posted to public primary schools. A shift from having primary school teachers teach all subjects to specialization in 2 subjects was effected from 2005 in an effort to improve quality of teacher training. The curriculum has since been tailored to child-centered approaches to teaching and learning.

In-Service Training
Findings indicate that in-servicing of science and mathematics teachers from secondary schools takes place through the programme for Strengthening of Mathematics and Science in Secondary Education (SMASSE). SMASSE has shifted its focus to include in-servicing of primary school teachers and has as a result been renamed Strengthening of Mathematics and Science in Education (SMASE). There are 108 centres countrywide that offer in-service courses during the school holidays for the said teachers. It was reported during the interviews that although this training programme under JICA and MoE funding initially started with the goal of strengthening the teaching of mathematics and science subjects, there is recognition that teachers in the humanities and arts subjects also need in-servicing and there are efforts in this direction although no concrete steps have been taken yet.

It came to light during the interviews that structurally in-service of secondary school teachers falls under the Directorate of Secondary Education. There were no concerted efforts in the in-servicing of teachers in ICT skills at the time of writing this report. It was also noted that the emphasis in in-service training of teachers has been in the sciences and mathematics. However, over time it became clear that the teachers in the arts and humanities had been neglected which resulted in the current planning for the inservicing of the latter teachers under the SMASE project.
4.5 Summary of key statistics

The table below gives key statistics of the education system. The data is drawn from the latest available information from the Ministry of Education (2009).

<table>
<thead>
<tr>
<th>Level</th>
<th>No. of Institutions</th>
<th>Number of Students ('000)</th>
<th>GER %</th>
<th>Number of Teachers</th>
<th>Student Teacher Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Public</td>
<td>Private</td>
<td>Total</td>
<td></td>
<td>Trained</td>
</tr>
<tr>
<td>Pre Primary</td>
<td>23,100</td>
<td>14,854</td>
<td>1,720.2</td>
<td>60.2</td>
<td>57,976</td>
</tr>
<tr>
<td>Primary</td>
<td>18,130</td>
<td>8,041</td>
<td>8,563.8</td>
<td>109.8</td>
<td>170,059</td>
</tr>
<tr>
<td>Secondary</td>
<td>4,261</td>
<td>2,305</td>
<td>1,382.2</td>
<td>42.5</td>
<td>42,867</td>
</tr>
<tr>
<td>Non Formal Education</td>
<td>N/A*</td>
<td>1,395</td>
<td>180.9</td>
<td>N/A*</td>
<td>3557</td>
</tr>
<tr>
<td>TTCs – Primary</td>
<td>18</td>
<td>50</td>
<td>17,922</td>
<td>N/A*</td>
<td>N/A*</td>
</tr>
<tr>
<td>TTC Diploma</td>
<td>2</td>
<td>*</td>
<td>1.8</td>
<td>N/A*</td>
<td>N/A*</td>
</tr>
<tr>
<td>Universities</td>
<td>7</td>
<td>21</td>
<td>122.8</td>
<td>N/A*</td>
<td>N/A*</td>
</tr>
<tr>
<td>TIVET</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Polytechnics</td>
<td>4</td>
<td>N/A*</td>
<td>22.9</td>
<td>N/A*</td>
<td>N/A*</td>
</tr>
<tr>
<td>Technical Training</td>
<td>27</td>
<td>1,000</td>
<td>22.1</td>
<td>N/A*</td>
<td>N/A*</td>
</tr>
<tr>
<td>Institutes of Technology</td>
<td>16</td>
<td>N/A*</td>
<td>10.6</td>
<td>N/A*</td>
<td>N/A*</td>
</tr>
<tr>
<td>Youth Polytechnics</td>
<td>750</td>
<td>N/A*</td>
<td>26.7</td>
<td>500</td>
<td>3500</td>
</tr>
<tr>
<td>Adult and Continuing</td>
<td>6,914</td>
<td>N/A*</td>
<td>118,264</td>
<td>1,773</td>
<td>3,089</td>
</tr>
</tbody>
</table>

Table 3- Statistics in the Education and Training Sector, 2009 Source: EMIS, MoE
*N/A = Not Available/Not Applicable

4.6 Inclusive Education and Special Education

4.6.1 Inclusive Education

Kenya’s concept of inclusive education has moved away from the traditional view of providing education for children with special needs to providing quality education to all
children, youth and adults through targeted support to specific or vulnerable groups. These include children working or living in the streets, those in Arid and Semi-Arid areas (ASALS), those with special learning needs, children involved in child labour, orphans, adolescent mothers, sibling minders, victims of domestic and internal political violence, and those affected by HIV and AIDS and the girl child.

Some of the measures that have been taken to address the challenges of inclusive education include:

- Free and compulsory primary and secondary education
- Development of an alternative secondary curriculum for learners who attend non-formal schools
- Adoption of multi-sectoral and multi-partnership approaches to involve civil society and private sector to improve opportunities for out-of-school children
- Implementation of the early childhood policy which helps identify vulnerable children and those with special needs early enough
- Mainstreaming of Non-Formal Education (NFE) that cuts across the various education levels
- Provision of special capitation grants to NFE institutions in marginalized areas

4.6.2 Special Education

Special education is defined by the Ministry of Education as education which provides appropriate modification in the curriculum, teaching methods, educational resources, medium of communication or the learning environment in order to cater for individual needs and differences. The population of those with special education needs was estimated at 10% of the total population in 2002. In the same year, only 10% of these children were enrolled in educational programmes.

The Special Education Division of KIE develops the curriculum for learners with special needs by adapting the curriculum for regular learners as required. Eight provincial workshops located in the provincial headquarters are staffed with technically trained personnel who produce teaching/learning materials, assistive devices and other support materials required for the special needs education division. Education assessment and resources are available in all districts and are provided in Education Assessment and Resource Centres (EARCS). Other services provided in these centres include:

- Guidance and counselling to parents of children with special needs
- Running courses for the parents to inform and educate them about their children’s needs
- Establishment of special needs units in regular schools
- Referral of children with special needs to special schools, units, integration programmes, medical examination and/or treatment
- Running seminars for teachers and field officers handling children with special needs

• Provision of teaching aids and
• Collection of information to inform planning for special needs.

The following table provides special needs statistics as obtained from the Ministry of Education website\textsuperscript{18}.

<table>
<thead>
<tr>
<th>Level</th>
<th>No of Institutions</th>
<th>No of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Primary Schools</td>
<td>97</td>
<td>23,459</td>
</tr>
<tr>
<td>Special Secondary Schools</td>
<td>7</td>
<td>1,026</td>
</tr>
<tr>
<td>Technical / Vocational Institutes</td>
<td>5</td>
<td>2,100</td>
</tr>
<tr>
<td>Schools with Special Units</td>
<td>1,100</td>
<td>N/A</td>
</tr>
<tr>
<td>Educational Assessment and Resource Centres</td>
<td>73</td>
<td>N/A</td>
</tr>
<tr>
<td>Primary Teacher Colleges with Special Education courses</td>
<td>4</td>
<td>N/A</td>
</tr>
<tr>
<td>Universities offering Special Education courses</td>
<td>2</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Table 4- Statistics in Special Education Source EMIS (MoE); N/A = Not Applicable

4.7 Governance and management of the education system

The management and implementation of the education and training sector is decentralized both institutionally and in terms of decision making with four broad levels:

• **At the central level**, the ministries responsible for education and training (Ministry of Education, Ministry of Higher Education and Ministry of Youth Affairs) are responsible primarily for policy and strategy.

• **At the provincial level**, there is a Provincial Director of Education (PDE) and a Provincial Education Board (PED) at each of the 8 provinces responsible for monitoring and coordinating all education activities in the province and supervising all district education programmes.

• **At the district level**, there is a District Education Officer (DEO) and a District Education Board (DEB) responsible for the management of education services, teachers, schools, funds and quality assurance.

• **At the institutional level**, there are Boards of Governors responsible for policy and strategy, School Management Committees (SMC) responsible for developing and implementing school plans and implementing education and training policies and Parent Teachers Associations (PTA) responsible for monitoring school activities and mobilizing additional resources. Each school has a head teacher who is the secretary to each institutional management board, a deputy head teacher and several heads of departments.

Universities are largely autonomous with all administrative functions independently managed through University Councils.

\textsuperscript{18} \url{http://www.education.go.ke/SpecialEducation.php}
As GeSCI works mostly with and through central government ministries responsible for education, a brief overview of the MoE, MHEST and MOYAS is provided in Annex 3. The table below shows which parts of the education and training sector the different ministries are responsible for. The capacity of these ministries is also briefly analyzed in the sections that follow.

<table>
<thead>
<tr>
<th>MoE</th>
<th>MHEST</th>
<th>MOYAS</th>
<th>Ministry of Labour</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE</td>
<td>Universities</td>
<td>Youth polytechnics</td>
<td>Industrial Training Centres</td>
</tr>
<tr>
<td>Primary</td>
<td>Science, Technology and Innovation</td>
<td>Vocational Centres</td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>Technical Education</td>
<td>NYS Centres</td>
<td></td>
</tr>
<tr>
<td>TTCs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Formal Education</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5- Education and training sector Ministries and their areas of responsibility

### 4.8 Education funding

The education and training sector receives the largest share of government spending. About 73% of the government’s social sector spending and 40% of the national recurrent expenditure goes to education. This translates to 7% of the GDP\(^{19}\). The Ministries disperse funds directly to the schools or institutions, a practice which is seen to ensure "greater ownership of resources by communities and institutional managers" and "minimizes wastage of resources."\(^{20}\)

As an example of government spending on education, in his budget speech\(^{21}\) delivered to the Kenyan National Assembly on June 11\(^{th}\) 2009, the Deputy Prime Minister and Minister for Finance, Hon. Uhuru Kenyatta, indicated the following allocations to the education sector:

<table>
<thead>
<tr>
<th>Allocation</th>
<th>Kenya Shillings</th>
<th>Euro Equivalent (1 Euro = 100 Kshs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free primary and secondary education</td>
<td>1 billion</td>
<td>10 million</td>
</tr>
<tr>
<td>Upgrading primary schools</td>
<td>1.5 billion</td>
<td>15 million</td>
</tr>
<tr>
<td>Construction of centres of excellence in secondary schools</td>
<td>6 billion</td>
<td>60 million</td>
</tr>
<tr>
<td>Recruit additional 10,500 primary school teachers</td>
<td>1.3 billion</td>
<td>13 million</td>
</tr>
<tr>
<td>Recruit 2,100 secondary school teachers</td>
<td>353 million</td>
<td>3.53 million</td>
</tr>
<tr>
<td>Purchase digital laboratory buses for each district</td>
<td>1.3 billion</td>
<td>13 million</td>
</tr>
</tbody>
</table>

Table 6- Education National Budgetary Allocation (2009/2010)

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Although education takes such a substantial portion of the national budget, the education sector still remains under-funded. This is because most of the spending in education goes to recurrent expenditure in the form of teachers’ salaries (e.g. the Ministry of Education spends 86% of its budget on teacher salaries) and school feeding programmes. This leaves a big gap in capital development in areas such as infrastructure and teaching and learning materials. This funding gap is filled mostly through development partner (donor) funding. There are two categories of development partners working with the sector: (1) pooled funders namely DfID, CIDA, UNICEF, and ADB who disburse their funds through direct budget support to the sector and (2) project funders who fund specific projects. VVOB is one such development partner whose specific focus is on ICTs and integration. USAID works under the ICT/GDA alliance as discussed later in the document. It was stated that theoretically USAID is a pool funder but practically it disburses its funds directly to those involved in the implementation of the ICT/GDA projects.

In line with the Paris agenda to harmonize and coordinate donor funding, the donors have formed an Education Development Partners Coordination Group (EDCG).

### 4.8.1 Education Development Partners Coordination Group (EDCG)

To support the MoE in the successful implementation of the Kenya Education Sector Support Programme (KESSP), the development partners agreed to establish an Education Development Coordination Group (EDCG) to:

- Focus at the policy level on strategic issues through supporting government ownership of KESSP
- Encouraging government-led donor coordination
- Promoting coordinated policy dialogue and technical support on strategic issues
- Ensuring coordinated and harmonized development partner support.

The EDCG consists of bilateral and multilateral development agencies, development banks and NGOs working with the sector through pooled funding arrangements, direct budget support or through project support. The group is chaired by USAID and deputized by CIDA. The EDCG meets on a monthly basis. The Permanent Secretary (PS) MoE chairs quarterly consultative meetings with the EDCG.

### 4.9 Major Challenges in the Education and Training Sector

The major challenges facing the education and training sector can be broadly categorized under access, quality, equity and relevance. As suggested in the Sessional Paper No. 1 of 2005 the government is already tackling most of these challenges although they will...
continue to trouble the sector in the short and medium term owing to the scale and depth of the issues.

4.9.1 Access to Education

Although the government has instituted FPE and FSE and enrolment has dramatically risen, access is still a challenge for these levels and even more so for ECE, TIVET, University education and Adult and Continuing Education.

A substantial number of children of school-going age are still not receiving any form of schooling. The efforts for addressing this are particularly challenged in ASAL areas where families have a nomadic way of life and in households where children help the parents to supplement the family income through petty trade. Cultural beliefs in certain regions reduce girls’ access to education as they are married off at an early age. According to a recent magazine publication, the MoE indicated that about 2.8 million children who should be in secondary school are not.26 The same article further reports that out of a total of almost 800 000 children of school-going age with disabilities, only 80 000 have been identified and assessed by teachers and social workers, leaving the vast majority without access to appropriate services. In addition the increasing number of orphans provide a significant challenge to the primary and secondary sectors, with about 1 million orphans in primary schools and approximately 150 000 in secondary schools, representing about 11% of the total enrolment in the secondary sector.

The ECE level has NER of only 42.1, there are still almost 1 million children not enrolled in formal schools, less than 50% of eligible children attend secondary school, 38.5% of the population is functionally literate and the university sector has a GER of only 3%,27 which is less than the African average.

The major issues with access are:

- Lack of adequate physical infrastructure to cater for increased enrolments at primary and secondary levels
- Low transition rates from primary to secondary and to tertiary levels
- Teacher shortages as a result of increased enrolments at primary and secondary levels and inefficient management, deployment and distribution of teachers
- Lack of clear policies at ECE level and for children with special needs

While the introduction of FPE is a great achievement in that many more children were able to enrol in schools, most schools were not equipped and ready to handle the large numbers of pupils in relation to teachers, physical classroom space, and learning resources (Mukudi, 2004).28 As noted in the Sessional Paper No. 1 (2004)29 the 18% increase in enrolment resulted in an overstretch of facilities, overcrowded classrooms


29 http://www.un-kenya.org/ThemeGroups/SessionalPaperFinaljan.doc
with high pupil to teacher ratios, and diminished community support as it was conceived among the communities that education was now free.

Government introduced FSE in 2008, but access to secondary education remains a challenge with the current infrastructure and resources of 6,484 secondary schools against 18,000 primary schools. According to the MoE the main objectives of the current education reforms are to raise retention in primary schools by reducing the number of children who might drop out. Through the implementation of KESSP and FSE the plans to maintain the transition rate from primary to secondary at 70% have been achieved. However, internal efficiency remains a major barrier to the provision of accessible and quality education. The MoE estimates the survival rate at primary level as low as 40% compared to 84% at secondary level. The cumulative drop-out rates in primary education is estimated at 37% and the repetition rate at about 15% between Standard 1 and Standard 7.  

Access and equity challenges in Adult Education and Non-Formal schools are related to low participation rates, regional and gender disparities. The Sessional Paper (2005) reports low participation rates in urban slums and ASAL areas in particular.

Access to education in TIVET institutions remains a challenge due to inadequate facilities to cater for the large numbers of primary and secondary education graduates. Despite substantial expansion in tertiary enrolments recently the transition rate from secondary to university level is still below 10%.

Access is also constrained by teacher shortages. According to MoE statistics (February 2008), there were 169,360 primary school teachers which indicated a shortfall of 47,354 teachers. 56,006 teachers were recorded during the same time in secondary education with a shortfall of 17,348 teachers. The shortfalls at both levels of education have however been noted to have eased slightly with the recruitment of more teachers in August 2008. The MoE reports that the combined yearly student intake for teacher training at the various public institutions has been estimated to be 25 000 students, a figure which falls well short of the reported teacher shortages at primary and secondary levels.

4.9.2 Quality
Maintaining the quality of education is a challenge that the Kenyan government continues to address. Since 2003 the Government of Kenya increased access substantially at all levels of the sector through interventions which include FPE, FSE and rapid increase of the number of universities in the public and private domain. This, however, impacted on the quality of provision as most schools were not equipped to handle the large numbers of students, in terms of the number of teachers, physical classroom space, and learning resources. Kinuthia (2009) reported that in some schools, some classes have as many as 80-100 students which has led to a dramatic increase in the number of privately owned

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Kenya ICT in Education Situation Analysis
and operated schools that target families who can afford to pay school fees. The high
class sizes have led to high student: teacher ratios and a lack of teaching/learning
materials resulting in a compromise in the quality of education.
While great strides have been made since 2005 when Sessional Paper No.1 was
published, the challenges related to the provision of quality education at primary and
secondary level remain and can be attributed to:

- Inadequate teacher preparation and teacher shortages. At secondary level
  shortages in Mathematics, the Sciences, English and Kiswahili have been
  identified.
- Lack of coordinated continuous professional development of teachers in other
  subjects than Mathematics and the Sciences where SMASSE plays a significant
  role.
- Over-loaded curriculum at primary and secondary levels
- Poor resource management in schools and poor learning environments due to
  overcrowding and inadequate facilities which includes poor health and sanitation
  facilities
- Gender insensitive environments
- Barriers for those with special needs which include inappropriate infrastructure,
  inadequate facilities, lack of teacher capacity to handle children with special
  needs and lack of coordination among service providers.
- Inadequacies in quality assurance mechanisms and implementation thereof.

Quality teacher education at all levels has been identified as a pillar to providing quality
education. The Sessional Paper (2005) reports that teacher quality is a major challenge to
which inadequate teacher training (both pre- and in-service) contributes. Secondary
education is reported to be characterized by poor performance in national examinations
especially in core subjects such as Mathematics and Sciences and this poor performance
could in part be attributed to inadequate teacher quality. With FPE and FSE teacher
shortages also contribute to this state of affairs, while teacher distribution and
deployment has an impact on quality and equity. This shortage seems unlikely to be
alleviated or addressed in the short to medium term as the 2009/2010 national budget
provides for only an additional 10,500 primary school teachers and 2,100 secondary
school teachers to be recruited on contract terms. Staffing challenges have been noted
to include optimal utilization of teachers, equitable distribution, and the provision of
adequate teachers within existing resources which results in having more than enough
trained teachers in the country but not enough resources to hire them.

The Government recently raised entry to public primary TTCs from a minimum of an
average Grade D+ to C Plain in KCSE. The TSC also indicated that future recruitment of
teachers would be based on subject competence rather than on mean score and interest.

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According to the Sessional Paper (2005) spreading the management of TIVET institutions under various government departments and ministries has led to disparities in the training standards, lack of effective coordination and limited linkages and articulation between such ministries and their related institutions. Furthermore, a lack of articulation and linkages between TIVET institutions and programmes and other higher education institutions and programmes has been cited by the Sessional paper. The paper also identified a mismatch between the skills acquired in institutions and skills demanded by industry as an issue requiring attention. Inadequate training of instructors and inadequate physical facilities and resources were further cited as factors impacting on the quality of TIVET provision.

The factors contributing to low quality provision in Non-Formal Education have been identified as lack of articulation and linkage with the formal system, inadequate learning and teaching materials and other resources and poor physical facilities.

According to the Madrid Cybermetrics Lab (2009) Kenya’s universities have been doing well in the African rankings with 6 Kenyan universities among the top 100 best performing universities in Africa (Strathmore at 12th place, Nairobi 22nd, Egerton 50th), second only to South Africa which has the highest number. However, some more effort is required in matching the needs of the society and the economy and in articulation with other levels of education.

4.9.3 Equity

The introduction of FPE, FSE and substantial increases in the number of higher education and TIVET students have resulted in far greater access to education and training opportunities. Despite this significant performance of the education and training sector, challenges related to equity and serious regional gender disparities across the provinces still exist despite the fact that Kenya has attained gender parity at the national level. Overstretched school facilities and high student: teacher ratios result in ‘inequity in quality’ especially in urban slums, rural and ASAL areas.

Research shows (as reported in Kinuthia, 2009) that regional disparities in education are closely related to, and often compounded by other socioeconomic factors. The nomadic and pastoralist groups have historically been marginalized and still remain on the margins of development although the government and various NGOs are currently working hard to improve conditions for children from nomadic, pastoralist, and other underrepresented groups by increasing resources, teachers, and building more boarding schools for them. UNESCO also reported that as a result of the discrimination they suffer, street children and children orphaned by AIDS are more vulnerable than other children as they struggle to survive daily, putting them at higher health and social risks.

The MoE estimates that of 800 000 children of school-going age with disabilities only 80 000 have been identified and assessed by teachers and social workers, leaving the rest to receive educational provision not suited to their needs. In addition, the Sessional paper reports that special schools and units only cater for children with special needs in the areas of hearing, visual, mental or physical challenge. This leaves out other areas of
special needs such as gifted and talented, psychosocially different, autism, multiple handicapped, specific learning difficulties and communication disorders. Special education provision has not been mainstreamed in all education and training sub-sectors.

The rapidly rising number of orphans also makes it difficult to cater adequately for their needs in primary and secondary schools. Children in urban slums, where over 60% of the total urban population is reportedly concentrated\(^\text{35}\), are not adequately catered for in terms of educational opportunities. Pupil-textbook ratios continue to be high in the rural areas and urban slums.

At university level rigid admission criteria for graduates from other post-secondary institutions which exclude them from participation in higher education and the imbalance between students studying arts and science based courses needs attention. A seamless system articulating education and training between the various levels with flexible entry and exit points would be required to encourage lifelong learning in its fullest sense.

### 4.9.4 Relevance

Education and training is often seen as a panacea for all social evils and as a vehicle for economic growth by raising incomes and employment opportunities. For education to fulfil such expectations it must be relevant and geared towards providing citizens with the required knowledge, skills, attitudes and values to survive, thrive and competently take up their responsibilities in a modernized, ever-changing and increasingly complex world. Education and training policies, plans and institutions should thus be cognizant of the changes taking place in society, in the economy and in the production and dissemination of knowledge in order to meet the changing demands and expectations of society and the economy.

Factors at all levels impinging on relevance include overloaded curricula catering for “just in case’ learning rather than “just in time’ learning. This results in a mismatch of skills between what is being taught in institutions and the knowledge and skills required for the transformation of the economy and/or development of society, a factor raised several times in the Sessional Paper particularly as it relates to post-secondary education. In this regard the paper refers to the fact that university education would have to be transformed to become demand-driven and responsive to the market and to national priorities. Furthermore, traditional and out-dated methodologies continue to be used in educational and training institutions thereby not inculcating and developing the skills and attributes such as critical and inventive thinking, analysis, synthesis, problem solving, effective communicative abilities and competence in using technology which are required for the 21\(^{\text{st}}\) century. The Sessional Paper further points to the fact that the private sector is not adequately involved in the design and development of courses. In addition to this, duplication of effort, wasteful and unnecessary competition between institutions and courses whose fee is way beyond the reach of many contribute towards hampering of the goal of lifelong learning.

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\(^{35}\) Sessional Paper No. 1 of 2005.
The Sessional Paper also reported on relevance of NFE owing to inappropriate methods and learning materials and lack of coordination required for the large number of service providers. Quality assurance mechanisms which would include checking for alignment with national priorities are also lacking.

### 4.9.5 Lack of coordination

In addition to the above challenges, there appears to be a lack of coordination, information sharing and joint planning across the sector, e.g. between units/directorates in the MoE, between the MoE and other Ministries central to education and training (MHES&T, MOYAS) and between the sector and other relevant authorities, e.g. the Rural Electrification Authority (REA), especially in the planning for roll-out of essential services. This leads to wastage of resources and duplication of effort which reduces the funds available for the services themselves considerably.

### 4.10 Steps government is taking to address challenges

The Government of Kenya is taking several steps to address these challenges. As the challenges are often interrelated, the actions being undertaken often target more than one challenge. For this reason, the key actions taken by the government are presented by level of education.

**At primary and secondary school level**

It was acknowledged during the interviews that although several measures have been taken to address the challenges above, there are still shortcomings related to many school–age children still being out of school, congestion in many schools, weak managements, internal administrative inefficiencies, low participation rates, a growing number of orphans due to HIV/AIDS and most recently competing priorities in a case where the government has to roll-out an extensive school feeding programme.

However, strategies have been put in place to address the challenges above. Key among these are:

- Continuation of the free primary education despite the challenges at hand
- Encouragement of community ownership for physical infrastructural development
- Improvement on the capacity of monitoring and evaluation committees
- Establishment of a programme for teacher professional development in pre-service and in-service.
- Regular review of teacher distribution against agreed staffing norms
- Development of mechanisms for assessing teacher competencies and awards
- Development and strengthening of school-based and zonal level quality assurance capacities
- Where possible, integration of alternative modes of provision of education
- Revision of teacher education curriculum to enhance the mastery of the language of instruction
- Enhancement of the use of Open and Distance Learning (ODL) in primary education.
In addition, Government intends to allocate Kshs 6 billion to construct a secondary school of excellence in every constituency to address inequities, improve quality and provide “equal life-long opportunities” to students across the nation. In order to enable schools to be connected to the ICT grid to exploit and promote e-learning, an allocation of Kshs 1.3 billion for the purchase of a digital laboratory bus for each constituency will be made (Budget Speech, 2009).

**Actions at university level**
Kenya was reported to have a Gross Enrolment Ratio (GER) at tertiary level of about 3% which is below the average for Sub-Saharan Africa of 5% (UNESCO, 2006). The Kenya Educational Network (KENET) recommended in its e-readiness report on the higher education sector that to increase the GER, Kenya might have to use Open and Distance Learning more aggressively which would require the use of ICT-based technologies.

The very high demand for university education in Kenya has partially been addressed through admitting evening and weekend degree seeking students as well as establishing satellite campuses in major cities and towns. It was noted in the KENET e-readiness report that 50% of the students enrolled in public universities are privately sponsored non-residential students who could greatly benefit from e-learning technologies to supplement classroom instruction. Another measure that is being used to expand access is to offer degrees in partnership with local middle-level colleges.

**Actions aimed at the TIVET sector**
TIVET has three components in the KESSP plan and as such is eligible for pooled funding. The African Development Bank (ADB) is in partnership with the Ministry of Higher Education and with TIVET in particular for the period 2009-2013. During this period ADB areas of focus are:
- Institutional infrastructure (construction and rehabilitation of buildings)
- Upgrading of 8 TIVET institutions to national polytechnics
- Construction of 8 more TIVET institutions at national polytechnic level
- Training and upgrading of skills of staff in TIVET institutions
- Review of TIVET curriculum which will be preceded by a labour market survey.
- Upgrading of 3 TIVET institutions to university institutions.

**Actions aimed at the Adult Education sector**
The main challenge is to expand access and to ensure that the required quality in literacy levels is achieved. To address this challenge, the MoE through KESSP (as Adult Education is one of the pillars) has allocated Kshs. 1,367.2 Million (13.672 million Euros) in the period 2005 - 2010 to Adult Education programmes.

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36 [http://eready.kenet.or.ke/staging/EA%20Universities%20e-readiness%20Assessment%20Findings.pdf](http://eready.kenet.or.ke/staging/EA%20Universities%20e-readiness%20Assessment%20Findings.pdf)
One of the major challenges cited during the interviews is that of human resource capacity especially in leveraging technology for teaching and learning. Although technology was underscored as a major way of expanding access, the budgetary allocation for the 2009/2010 financial year did not make provision for ICTs, despite the fact that the Department of Adult Education (DAE) singles out the importance of ICTs in addressing its challenges.

The Directorate also raises funds through private-public partnerships and development partners. At the time of writing this report UNESCO, an active development partner in the directorate, has supported the setting up of two e-Learning Centres in Lamu and Nairobi. DfID, it was reported, was in the process of providing funds for the planning of a mass adult literacy campaign which, it is hoped would help reduce the illiteracy level (7.8 Million) by at least 50% by 2015.

Various measures have been taken to address the challenges in this sector which include:

- Mainstreaming of alternative modes of provision of education to include non-formal, mobile and double shift schools with multi-grade teaching to expand access.
- Adoption of measures commensurate with the challenges in the ASAL and densely populated urban areas.
- Regular refresher courses for adult education instructors
- Establishment of over 170 community libraries and community learning resource centres
- Adoption of innovative approaches for materials production.

**Actions aimed at Non- Formal Education**

The mainstreaming and linkages of Non Formal Education that cuts across various education levels has provided one way of increasing access. Information obtained from the MoE indicates that the alternative secondary education curriculum for learners in Non-Formal Schools has been developed and tested for use. It was also reported that although the learners in the Non formal institutions are supported under the free primary and free secondary schooling, the facilities in these institutions are not supported by the government as some of these are structures in private properties. In the slum areas, challenges were cited in the infrastructural and environmental setups within which learning takes place.
5 STATE OF ICTS IN EDUCATION

The history of ICTs and education goes back to Kenya’s post-independence years (1963). At that time the use of radio broadcasts was seen as the best way of harmonizing education standards across the country for all students and teachers. Though this has continued to be used to date, other ICTs like the television were not widely adopted for the same purpose in Kenya. The convergence of information and telecommunication technologies has resulted in the computer being a powerful ICT tool through which all the advantages of the radio and the television are combined.

The Rapid Institutional Assessment (RIA) of Kenyan institutions involved in ICT-based learning and e-learning done by GeSCI and DEG in 2007 showed that ICT and e-learning development in Kenya was (and still is, based on data gathered during the Situational Analysis in 2009) at a particularly dynamic stage. Much is being planned, initiated and implemented by many agencies (both in the private and public sectors). This state of affairs presents both opportunities and challenges to the country, the education and training sector and its institutions.

ICT has penetrated many sectors including banking, transportation, communications, and medical services. The Kenyan educational and training sector has also taken major steps in embracing ICT in the sector despite a number of teething problems. These steps include among others the recognition of the role that ICTs can play in addressing the challenges facing education in the country. This is seen in the various sectoral papers that have been developed, the reduction of duty on all ICTs and especially those destined for educational use, the prominence given to ICT integration in Education in the current 2009/2010 budget and the government’s commitment in funding 213 schools to acquire ICTs. However, it is worth noting that these initial steps need to be consolidated in order to bring real benefits to the Kenyan child in the classroom.

GeSCI’s experience in other developing countries which is backed up by research shows that the successful deployment and integration of ICTs in Education requires “an end-to-end” system with the following major components:

- Government commitment and support for ICTs in Education
- Comprehensive, holistic and coherent policy and strategy
- Institutional capacity which includes visionary leadership and management with clear mandate, appropriate structures, funding, human resources
- ICT infrastructure deployed appropriately to achieve educational objectives
- Curriculum that supports and encourages ICT use
- Availability of e-content and other digital learning materials
- Teacher education covering both ICT skills and ICT integration and continuous teacher support
- Maintenance and technical support strategies
- Monitoring and evaluation system

38 GeSCI TCO report
• Multi-stakeholder partnerships (MSPs)

This section will focus on determining the status of ICT deployment, integration and use at various levels of the education and training sector. The next section will consider issues of institutional capacity including overall policy, strategy and government commitment. Throughout this review, efforts will be made to determine, the strategies developed or under development and any gaps or opportunities to address.

5.1 ICT in Education Deployment

This section on ICT deployment will tackle a number of issues related to the number of ICTs at each education level, deployment models, connectivity and electricity and maintenance and technical support strategies. ICT deployment in primary schools is not discussed because “attempts to set up basic ICT infrastructure in primary schools are almost negligible.” However, it was noted that efforts are currently underway by Intel under the Accelerated 21st Century Education (ACE) to improve the use of ICTs in teaching and learning in primary schools. A pilot project will be undertaken later in 2009.

5.1.1 ICT Stocktaking

One of the challenges of doing this analysis was determining how many schools and other educational institutions have ICTs. During the course of the situational analysis there has been frequent reference to a baseline study for schools conducted in the recent past but the results of which have not been analyzed. Nevertheless, various documents and the interviews conducted for the situational analysis provided some figures on the state of ICT deployments in the education and training sector, which are presented below. These figures may need further verification and therefore must be taken as indicative only. And as ICTs cover a broad range of technologies, we shall consider for this purpose computers, radio and television as the most prevalent forms of ICTs used in education. Internet connectivity is considered separately.

Computers in Secondary Schools

According to the National ICT in Education Strategy of 2006, “most secondary schools in Kenya have some computer equipment” but “only a small fraction is equipped with basic ICT infrastructure” necessary for teaching and learning. The same document estimates that there are about 150 students per computer. The situation is further aggravated by the fact that “most schools use less than 40% of the available ICT infrastructure” and “furthermore, very few schools are using ICT as an alternative method for the delivery of the education curriculum.”

There have been more computer deployments and more concerted efforts to integrate ICTs in education since the ICT strategy was drafted. But the number of secondary school students has also risen quite dramatically due to FPE and FSE meaning that overall gains in deployment are most likely limited. Most computers are acquired by the schools through private donations or purchase from school fees. Interviews with officers

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39 National ICT in Education Strategy 2006
from the ICT unit indicate that there are about 15,450 computers in 1,300 secondary schools in 2009. Reports from interviews and examination of documents indicate that there are more than 26,620 computers in education institutions which span across other institutions beyond secondary schools.

As far as could be ascertained the criteria for placing computers in schools are:

- Adequate security
- Electricity supply
- ICT literate teachers
- School management support.

It was reported during the interviews that the MoE has set guidelines and standards for ICT deployments but these have not yet been circulated. The intention is to circulate them during this financial year. Quality assurance and control was cited as a challenge due to budgetary constraints and the limited capacity of officers on the ground. This means that schools would most likely acquire what they could afford and the inspectors are not yet capacitated to enforce any standards in as far as ICTs are concerned.

The ICTs in schools are widely used for basic literacy skills acquisition, teaching of ICT as an examinable subject and for subject specific teaching for those with digital content.

The following are notable deployments:

- The MoE disbursed Kshs 1.5 million (€15,000) to 213 schools which were evenly distributed across the country’s 71 districts in 2006. This money was to be used by the school-based education managers to acquire 25 new computers per school, one printer, and educational software, sensitize ICT teachers on technical maintenance, and buy a printer and the acquisition of a school management system. Computers for Schools Kenya (CFSK)\(^{40}\) has been reported to have installed about 18,000 computers in over 600 educational institutions each receiving about 20 computers.
- The ICT Trust Fund provided about 200 schools with computers with each school receiving 20 computers.
- The NEPAD e-Schools project provided 6 schools with 20 computers each.
- The Rural Schools Project\(^{41}\) which is the other active member of NICE indicated that they have provided over 4,500 computers to a number of unidentified schools.

In the most recent budget (2009-2010), funds have been allocated for the purchase of digital laboratory buses for each district. This will be achieved through the Economic Stimulus Programme. It was reported that this initiative is under the Ministry of Information and Communication and is aimed at fast tracking schools in each constituency.


\(^{41}\) [http://www.rural.or.ke/portfolio.php](http://www.rural.or.ke/portfolio.php)
Computers in Teacher Training Colleges

According to interview with ICT/GDA, the USAID funded project supporting ICT integration at the Primary Teacher Training Colleges (PTTCs) which is being implemented by the Academy for Educational Development (AED) aims to develop a sustainable ICT strategy for Colleges and to build capacity of the PTTCs to manage ICT for pre-service teacher education. Shanzu and Garissa Colleges would be developed into centres of excellence. Delivery of ICT equipment (2 laser printers, 2 webcams and TV sets) have been made to all 19 PTTCs. Multi Choice provided satellite dishes, decoders and access to educational channels including the Mindset programme for Colleges, The History Channel, National Geographic, National Geographic Wild, Discovery Channel, Animal Planet, BBC World and BBC Knowledge to the PTTCs. Mindset provided a Talkbox and content server.

Computers in Universities

According to the KENET e-readiness survey in 2007, the higher education community was noted to be ready to use ICTs for learning, teaching, research and management. However, it was reported that institutionally the leadership has not prioritized ICTs strategically resulting in low allocation of operational budgets to ICTs. This has resulted in a lack of appropriate investments in campus networks and infrastructure as evidenced in the same report by an indication that there were fewer than 3 computers for every 100 students.

Critical issues in relation to ICTs at higher education institutions that were highlighted in the report include:

- Inadequate internet bandwidth
- Low access to networked PCs by staff and students
- Low quality of campus network infrastructure and services
- Lack of integrated management information system
- Minimal integration of ICT in curriculum
- Limited off-campus access to library resources
- Limited ICT research and innovation
- Lack of local research databases and
- Lack of frequent staff upgrades.

Computers in TIVET institutions

During the interviews with TIVET officials it emerged that the state of ICTs and ICT in education in different TIVET institutions were very varied. However, there has not been any baseline study conducted to ascertain what is available in the field.

Previously, institutions received funding after writing proposals to the government and out of their own arrangements with other funding institutions. Currently, there is a budgetary allocation for ICT integration in TIVET institutions. Institutions have utilized the funds for acquisition of ICT Infrastructure and equipment. Most institutions have established computer rooms, laboratories or other teaching-learning centres for the teaching of computer user skills.
It was elicited during the interview with MOYAS officials that although there were no dedicated funding for ICTs, funds allocated for the purchase of tools and equipment could be used to buy ICT equipment. So far 10 Polytechnics have been equipped with 3-4 computers each depending on the enrolment in each polytechnic. However, this will remain a major challenge with 750 polytechnics to be equipped. It was reported that the 10 YPs which received equipment will serve as pilot centres for the new curriculum. The small number of computers poses a real challenge as ICT is a high priority for the youth in their training needs. Another challenge that was cited is the lack of human resource capacity in the form of instructors due to lack of funding from the government for their emoluments. It is appreciated that scaling up the use of ICT and improving on the ICT infrastructure would greatly increase relevance, efficiency and effectiveness in meeting the training needs of the out-of-school youth.

Kinuthia (2009) reports that in 2008 the Ministry of Youth Affairs' Youth Enterprise Fund (YEF) started a Digital Villages project designed to connect rural and urban areas with ICT. The project is funded through government and private sector resources. The 2009/2010 budget allocates an additional Kshs 500 million (€5 million) to the YEF (Budget Speech, 2009). The Digital Villages project will provide each constituency with at least eight computer workstations and training in entrepreneurship. In addition to intended positive outcomes on agriculture, health, and commerce, other expected results are enhancements in the education system such as increasing online course offerings and improving school management systems, including recording and reporting examination results (Wanjiku, 2008). It was noted subsidized tuition is currently being provided in over 400 Youth Polytechnics.

Computers in Industrial Training Centres

During the interviews with officials from the Ministry, it was reported that there are 5 training centres country wide under the Directorate of Industrial Training in the Ministry of Labour and Human Resource Development and there are plans to expand these to 8 in line with Vision 2030. Plans are underway for the directorate to set up facilities through which practical training will be provided to graduates with a goal of bridging academic knowledge with practical industry requirements. According to information from the Ministry there are a minimum of 15 computers per centre with ICT being integrated in teaching and learning as is the practice in the industry. Basic ICT literacy skills are given to everyone but the use of ICTs is subject and content specific.

5.1.2 Deployment models

Computer labs

The first concerted efforts to deploy computers in schools were initiated in 2003 by Computers for Schools Kenya (CFSK) which is a Kenyan based NGO. The main objective at the time as reported by the Executive Director was to provide ICT skills to Kenya’s young generation in the public schools as the cost of acquiring such skills in the commercial colleges was financially prohibitive for the rural youth. The focus of these deployments was rural public secondary schools. Consequently, these computers were located in a computer lab in each of the recipient schools. The number of recommended
computers at that time was 20 as class sizes were at 40 students. This made it possible for 2 students to share one computer.

With time, it was noted that the overall goals shifted and computers were seen more as having the potential and power to improve education and training and as tools to address some of the challenges facing the education and training sector in the country.

The choice of a deployment model should be driven by the educational objective(s) to be achieved. However, it appears that the “default” model in most educational institutions is the computer lab. The computer lab model is best suited for ICT skills training but is not necessarily the best approach for integrating ICTs into teaching and learning. This is based on GeSCI’s experience in other developing countries which is backed up by research (UNESCO Bangkok, 2004; Canadian Education Association, undated; ICTs in Schools in Turkey, 2005)\(^\text{42}\). The ICT Options Paper, however, recognizes the limitation of computer labs and also calls for “2-3 computers on wheels to integrate technology into classroom practice.” As noted in the ICT Options Paper, the investment required for this deployment is massive and probably beyond the financial ability of the system. Therefore, the choice of deployment model is a compromise between cost and educational value. Nevertheless, there are other deployment models in the educational system including ICTs for administration and laptops for teachers.

For secondary schools, the “ideal” computer lab is supposed to have 20-40 computers, printers, copier, scanner, projector, digital video recorder, webcams, microphones and special needs equipment\(^\text{43}\).

**Laptops for Teachers**

This is a scheme that is meant to provide affordable laptops to teachers. It was reported that the private sector will be involved in the provision of the laptops with the ICT Integration Team providing the specifications and ensuring the quality of the laptops in tandem with the wider ICT integration agenda. Loans will be availed for the laptop acquisition and subsequently recovered through a check-off system by the Teachers Service Commission (TSC). The interest on the loans will be shielded through the Ministry of Information and Communication civil servants’ laptop programme.

The goal of the project is to encourage teachers’ use of modern and dynamic educational tools. It was reported that the government will provide a subsidy which has already been allocated in the current financial year.


\(^{43}\) ICT in Education Options
5.1.3 Connectivity
As far as could be ascertained, connectivity is generally limited to a few schools. Connectivity is largely dependent on national infrastructure. As discussed in section 3.2 above, the telecommunications infrastructure in the country is improving rapidly. Apart from national fibre backbones being developed, 3G cellular services now cover most of the country offering for the first time the possibility of decent connectivity to most educational institutions. The landing of the submarine fibre and others planned for later 2009 could greatly improve and lower the costs of connectivity.

Kenya Education Network (KENET)
The higher education sector probably has the best connectivity mainly due to the presence of a functional National Research and Education Network (NREN). NRENs are considered to be the most effective way to service the often special (very high speed) connectivity needs that higher education and research institutions need. The Kenya Education Network Trust’s (KENET) mission is to provide quality and cost-effective network services through a sustainable, high-speed and reliable national educational and research network. KENET aims to interconnect all the universities, tertiary and research institutions in Kenya by setting up a cost effective and sustainable private network with high speed access to the global Internet as well as facilitate electronic communication among students and faculties in member institutions, and share learning and teaching resources by collaboration in research and development of educational content. This reflects a major achievement for the education sector in Kenya as KENET is one of a very few NRENs operational in Africa. KENET reported in April 2009 that it had already connected 17 higher education institutions to the Kenya Education Network Trust bandwidth. While the trend for many NRENs in the developed world is to provide connectivity to the whole education, training and research sector, KENET is still concentrating on the tertiary sector.

Although in its 2006 e-readiness survey, 75% of the respondent students considered the internet services offered in Cyber cafes and other commercial centres better than that offered by KENET to member institutions, current reports indicate that a massive bandwidth expansion project is underway. It is hoped that this will greatly improve on connectivity challenges, trigger innovation among students and impact on education delivery methods.

5.1.4 Electricity
One of the biggest factors hindering ICT growth in general is lack of electricity. Figures from the MoE indicate that 75% of the secondary schools in Kenya have a source of electrical power which could be from the grid lines or from generators and 25% of the primary schools have access to electrical power. Bearing in mind that most of the schools are in rural Kenya, the government recognizes this constraint to ICT growth. For example, Government, in its effort to address the challenges in Northern Kenya and other

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Arid lands, will provide Kshs 200 million (€2 million) for the installation of solar panels at secondary schools (Budget Speech, 2009).

The launch of the Rural Electrification Authority (REA) serves as a good step in ensuring that electricity is widely available in rural Kenya. Closer collaboration between the two entities (REA and MoE) would go a long way in speeding up rural electrification especially in education institutions in these areas.

However alternative power sources may need to be harnessed alongside mobile connectivity options (e.g. 3G) if the power of ICTs is to be truly leveraged to spur economic growth and address the challenges in the education sector.

5.1.5 Maintenance and technical support

Maintenance of ICTs is vital if they are to be optimally used. As already noted, it is estimated that 60% of the ICT infrastructure in schools is not really used and lack of maintenance is cited as one of the major causes of this situation.

Maintenance refers to actions taken on equipment and systems e.g. repair, upgrades, diagnostic and other preventive measures; while technical support refers to actions taken on behalf of users to keep them working or help them get more out of the IT systems e.g. help desk, initial training, FAQs

In general, there are four main models of maintenance in use around the world as summarized in the table below. Some countries and schools rely on more than one model.

<table>
<thead>
<tr>
<th>In School</th>
<th>Share with other schools</th>
<th>External service providers</th>
<th>Government/ state/ Public agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offered by teachers and/or ICT technician in the school either full time or part time. Usually considered as first line of defence and help is available on demand.</td>
<td>Schools (especially near each other) can share ICT teacher or technician. Can be cheaper for schools. Or schools can jointly hire external provider. Model is cheaper for schools but only works if schools are in close proximity of each other. Can be problematic and so requires formal agreements signed between schools</td>
<td>Outsource option. Schools can contract external provider or government can contract at national or regional level for all schools. Usually the most cost effective and efficient especially if government is contracting. Provider signs contract with clear deliverables and penalties.</td>
<td>Some (mostly developed) countries have either government/ state/ county/ public funded firms offering tech support and maintenance. Usually used in conjunction with a dedicated website with good practices</td>
</tr>
</tbody>
</table>

Table 7- Maintenance models

In Kenya, the predominant model seems to be the in-school model. Technical support and maintenance of ICT equipment is left in the hands of the school boards. The board

46 Definitions from BECTA
usually hires an ICT teacher who is not only able to train in ICT as a subject but also to maintain the equipment in the school. The qualifications of the ICT teacher as recommended by the MOE should be at least a diploma holder in Computer Science from a recognized institution. The emoluments for the said ICT teacher are paid by the school board.

In the face of FSE, charging fees from parents for the maintenance of equipment in the schools was reported to be met with a certain level of resistance by the parents. The money released to each school by the government does not have an allocation for ICT. School boards therefore have to be creative and devise ways of raising income for maintenance and technical support at school level. The fees collected are used to pay the ICT teacher for the maintenance of the equipment.

At the higher education level, universities and to some extent the tertiary TIVET institutions usually have dedicated ICT units which are in charge of maintaining the ICT infrastructure of the institution.

5.2 ICT Integration in Education

ICT integration to improve educational outcomes is the main goal of any ICT in education intervention. However, desired learning outcomes will not be achieved if overall strategies are not comprehensive or realistic. International best practice highlights that ICT integration should cut across all levels of the education sector, both horizontally and vertically. In resource constrained environments unified and innovative approaches to infrastructure deployment, capacity building, connectivity, maintenance and support are required. Reports indicate that the MoE and other stakeholders are concerned about the quality of secondary education which is characterized by poor performance in core subjects such as Mathematics and Science. They recognize the obvious benefits for integrating computers into secondary schools as students at that age need to focus on subject-specific content, greater critical thinking skills, scientific inquiry, and math, science and languages. As stated in the ICT in Education Options Paper, students could benefit greatly with the analytical, creative, and collaborative power of computers to map out and analyze assumptions, present ideas, and participate in projects with peers from around the country and around the world.

In this regard the Directorate of Policy and Planning of the MoE indicated that ICTs offered new opportunities for fresh approaches and innovative strategies to help the education system address issues of equity, quality and relevance now that the net enrolment rate stands at 91.6%. However, apart from individual and fragmented efforts, there has as yet not been a comprehensive initiative to operationalize the integration of ICTs in secondary schools. Simply deploying ICTs into educational

http://www.cea-ace.ca/media/en/Trends_ICT_Integration.pdf;

48 Information obtained during interview with Directorate of Policy and Planning, 15 April 2009.
institutions will not automatically lead to its integration into teaching and learning. The effective integration of ICTs will to a large extent depend on the curriculum, availability of appropriate digital content and trained and supported teachers.

Several groups are active in supporting the sector in ICT integration. Below is a brief overview of the initiatives:

**ICT/Global Development Alliance (ICT/GDA)**
The ICT/GDA working group is a consortium of partners working with the MoE on ICTs and Education under the USAID project. The partners are drawn from the private sector and other development partners. Among those in this working group are USAID, Mindset, Intel, Microsoft, CISCO, KIE, VVOB and AED.

**ICT Integration Team**
The ICT integration team is convened and championed by MoE. It meets twice every month (1st and 3rd Wednesday of the month). Out of the realization that there are a lot of initiatives in ICT in education which lack coordination, there are efforts to enable the ICT integration team to be the coordinating body of all ICT related activities within the Ministry. At the time of writing this report, the members of the team included:

- Directorate of Secondary Education
- Directorate of Basic Education
- Quality Assurance
- Directorate Policy and Planning
- Adult Education
- CEMASTEA
- KESI
- KIE
- EMIS
- ICT Unit
- VVOB

MoE in collaboration with other stakeholders plans to establish a National ICT Innovation and Integration Centre to facilitate and support the integration of ICTs into the education sector.

**5.2.1 Integration at secondary schools**
The MoE is quoted in the ICT in Education Options Paper\(^49\) to be concerned with the quality of education especially as evidenced in the performance in the sciences and mathematics. The importance of integrating ICTs in education is underscored in the options paper with particular reference to the possibilities that ICTs not only help students acquire the 21st century skills as exemplified in greater critical thinking skills, scientific inquiry, collaboration, analysis of assumptions, presentation of ideas, and participation in projects with peers, but also in being used to improve on the quality of delivery, presentation and conceptualization.

\(^{49}\) ICT in Education Options Paper, 2005
While acknowledging the potential of ICTs in addressing educational challenges, a number of issues have been highlighted in the same paper as hampering the integration of ICTs in education. These include:

- Inadequate computer to student ratios
- Current focus on ICT as a subject rather than on enhancing the curriculum
- Enormous investment required for appropriate models of ICT integration, for example computers in classrooms as opposed to computers in laboratories
- Lack of relevant data on the number of ICTs in schools which would inform planning for integration
- Availability of e-content. However, the recent launch of e-content that has been developed in Kenya Institute of Education (KIE) shifts the challenge from that of e-content availability to that of training of teachers for integration, ICT integration across the curriculum and ICT infrastructural development in the schools.

### 5.2.2 Integration at Universities

The availability and access to ICT is essential for developing the IT workforce and professionals for the knowledge economy. A review of the strategic plans of all universities during the e-readiness study by KENET indicates that there is no explicit reference to developing the workforce for the emerging economy as exemplified in a lack of strategies to increase internal e-readiness on the campuses. The same e-readiness report indicates that even if the national information infrastructure is extended to all institutions and the prices are reduced dramatically, the higher education institutions were not ready to effectively use ICT.

### 5.2.3 Integration at TIVET levels

In TIVET, strategies for integration of ICT for both professional and managerial applications include; developing adequate ICT capacity and infrastructure within the TIVET system, establishment of ICT centres of excellence and institutionalization of Management Information Systems (MIS) in all TIVET institutions and promoting the use of ICT in curriculum delivery and management systems. These strategies involve:

1. Provision of infrastructure and equipment needed for ICT
2. Identifying and equipping institutions for establishment as regional centres of excellence for research and development in TIVET system
3. Developing and implementing an ICT policy for TIVET institutions
4. Installation and operationalization of Management Information Systems in all TIVET institutions.
5. Introduction of new modes of training which involve use of ICT
6. Building the capacity of staff in TIVET institutions to use ICT in curriculum delivery
Through the ICT integration component of the TIVET investment programme under KESSP some funds for ICT infrastructure and equipment has been provided to TIVET institutions. Most institutions have established computer rooms, laboratories or other teaching-learning centres for the teaching of computer user skills. Some institutions are gearing up to establishing or strengthening their ICT Departments using the funds. Some institutions are already using digital content on CD ROM and the internet. The availability of support from the Ministry has improved the ICT landscape in the institutions.

However, there are aspects of infrastructure deployment that still pose a challenge to most institutions. These include internet connectivity, creating LANs within the institutions and software for use in their computers.

There have been several ICT integration sensitization workshops for lecturers in TIVET institutions, in addition to institutions being instructed to train their staff on basic ICT skills and this is running in many of them. Institutions are developing ICT policy documents at their level as per the requirements of the 2009 performance contract. Many of the institutions have installed Education Management Information Systems which are largely procured independently.

It emerges therefore that there is urgent need for an ICT integration roadmap because the implementation of ICTs in education in the institutions and coordination of ICT in education related activities is difficult without the plan. Although the goal may not be to have the institutions progress at the same rate, there is need for an overall implementation plan. The development of such a plan would need to be informed by a baseline survey which comprehensively captures the ICT landscape in these institutions.

Although ICT integration has been interpreted in different ways in the TIVET institutions, the trend of ICT use has been noted to start in administration, followed by ICT literacy classes and the introduction of ICT based courses through the national TIVET curriculum. These courses are also made available to the general public as a way of raising income in the institutions. However, findings indicate that ICT integration in teaching and learning has not been initiated. The primary reason for this lack of adoption was noted as lack of awareness, understanding, requisite skills and institutional or sectoral policies that would support the integration of ICTs in education either at the institutional level or national level. It emerged from the interviews that the current curriculum for TIVET institutions should be enhanced to allow for more effective ICT integration in technical training.

5.2.4 ICTs, Curriculum and Assessment methods

Kenya is not an exception in the trend whereby the introduction of ICTs is primarily aimed at developing ICTs skills. This was actually the stated objective in the initial objectives for introducing computers into schools by the pioneering NGOs between 2000 and 2003. Consequently the development and implementation of “ICTs as a subject” has taken precedence over the review of subject-based curricula and the identification of areas where ICTs could be used to improve teaching and learning. It was reported that there has been a recent shift in thinking to ICT use in the classroom but this has not yet been evidenced in policy and/or strategy. As would be expected there has been

Kenya ICT in Education Situation Analysis 49
accelerated efforts to develop the “ICT syllabus” for the secondary sector, the Teachers Training Colleges, the TIVET institutions and the Ministry of Youth. Plans to develop the same for the primary sector are underway. According to information obtained from the Department of Secondary Education in the MoE (16 April 2009), 948 schools (private, public, secondary and primary) offer ICT as a subject, but most teachers are not adequately trained for the task, and there are no frameworks in place to guide the implementation of ICTs.

However, over time the priorities have shifted to ICTs as tools to improve teaching and learning. It was also reported during the interviews that efforts to review the use of ICTs in the curriculum are underway. One such effort cited was in regard to a requirement for all publishers to submit not only the textbooks for evaluation, but also accompanying CDs whose contents could be reviewed alongside the textbooks. These efforts did not bear much fruit in the 2008/2009 textbook submission period as all the publishers submitted the textbooks without the CDs. In future this requirement might be included in the policy for textbook submission.

The registration of examinations in all institutions was reported to be automated and an online activity. The schools and private candidates have the facility to register for examinations online. The authentication of registration information is also available online. Although this would provide a lot of convenience especially for all education institutions that are located outside Nairobi (as KNEC offices are located only in Nairobi), it was reported that 45% of the education administrators still prefer coming to the city to register and submit their applications manually. This, according to the feedback from the interviews, could be driven by among other things a mindset of not wholly trusting the reliability of online registrations and the financial benefits associated with travel.

5.2.5 Digital content

Some countries follow the “adopt, adapt and develop” phased model of e-content development while building the capacity and infrastructure for their own digital content development. Kenya decided to develop its own content for schools through KIE after a scan of available content. The Kenya Institute of Education (KIE) is responsible for curriculum development for the school system and thus well-placed for the development of e-content closely aligned to the national curriculum. The goal for developing e-content is to improve access to and quality of education in Kenya through e-learning with the following specific objectives:

- To introduce more interactive approaches to the traditional teaching /learning process.
- To broaden the available resources for teaching and learning.
- To take care of a broader category of learners.

KIE carries out the following in-house activities in its bid to develop e-content:

- Constitutes and trains subject-panel members on e-content development.
- Identifies relevant content for digitization.
- Scripts, digitizes, and edits digital content.
Sensitizes stakeholders (students and learners) to appreciate the use of multimedia and application of technology in learning.

Pilots the e-content in schools

Carries out orientation of teachers on the use of e-content.

Networks with other institutions for mentorship on content digitization skills.

Disseminates the packaged e-content to users.

Carries out monitoring and evaluation of e-learning activities in the schools.

Revises the e-content in line with curriculum dynamics.

Trains other curriculum developers in e-content development, evaluation and customization.

In order to make the process manageable and sustainable, KIE decided that the e-content development process would follow the normal curriculum development regulation with a reduced number of subject panel membership. The panel members for each subject include members drawn from quality assurance, Kenya National Examination Council, six subject teachers drawn from schools across the country, a curriculum specialist, and a KIE digital curriculum specialist who is the secretary to the panel.

The curriculum officers work closely with multimedia designers, ICT specialists, technicians and instructional designers among others. The skills regarded as critical in the e-learning department in KIE are: subject matter knowledge, child psychology, instructional design, curriculum specialization, multimedia skills and project management.

Two e-content development projects have been running concurrently in KIE - one has been co-funded by the government of Kenya and Microsoft with a focus on secondary education content. In this project the government provided the equipment and resources, facilities and software. Microsoft provided the training. The development of this content was started in 2006 and was completed and launched in August 2009. It has been reported during the interviews that one CD per school per subject of the content would be sent to all the schools as support materials for teaching.

An alternative version for all the schools without computers has already been developed and will be used on Television sets. “Anti-dubbing” software has been installed in the CDs which will ensure that this content will not be duplicated. Additional CDs can be purchased from KIE.

The second project has been through Mindset South Africa which was funded by USAID for the development of e-content for primary education. Initially the focus was primary 4 and 5 but has now expanded to primary 6 and 7. Mindset in this venture has provided the e-content development skills at KIE whereas USAID has provided ICT hardware and networking equipment to all the 19 primary teacher training colleges through CISCO. The roll out of the developed content has primarily been in the TTCs. AED, funded by USAID, is involved in the pre-service training of the teachers in the TTCs and especially in the integration of ICT in primary teaching and learning.
The human resource base as reported during the interviews has been upgraded appreciably during the development of the said content but mainly in the development of multimedia content with proprietary software. Skills in the development of content using more affordable open source software are widely lacking.

KIE received considerable support from the parent Ministry through programme support and funding to execute the e-content development project. The institution is ISO certified, has direct funding for all e-content related activities, has adequate ICT infrastructure and has been connected to the East African Submarine cable for high speed broadband.

During the content development phase in KIE, there were efforts to adopt content from other content providers. It was reported that these content providers were all from outside the country with the most closely aligned content being from Cyberschools Technology Solutions with a physical presence in Nairobi but its entire development team based in India. The content from Cyberschools Technology Solutions (CSTS) was picked as one of the best after an e-content evaluation exercise that took place in March 2007. According to reports from this study, they were contracted to provide content to 70 of the schools that had received government funding for the school computerization project.

The NEPAD e-Schools project initially used the LearnThings content which has since been found not to be aligned with the local curriculum and was as a result not adopted beyond the project life.

5.2.6 ICT teacher training
The *ICT in Education Options Paper* prioritized building ICT capacity at the Teacher Training Colleges (TTCs) as an intervention which could quickly yield high returns. The National ICT in Education Strategy also notes that “the limited and uncoordinated approach to imparting appropriate ICT skills and competencies to teachers remains a major barrier in the integration of ICT in education in Africa generally, and in Kenya in particular” and that there is a lack of enough qualified ICT teachers in Kenya. Efforts are under way to address this challenge and can be broadly categorized as those targeting pre-service or training of new teachers and those targeting in-service or professional development of existing teachers.

**Pre-service training (PRESET)**
Pre-service training for teachers is carried out at primary teacher training colleges (PTTCs), diploma teacher training colleges and universities. In general, most of these institutions have introduced ICT training as part of teacher preparation. ICT as a curriculum subject is offered in the 19 public primary teacher-training colleges. Currently there is an ICT/GDA project encompassing all the primary teacher training colleges for ICT integration into teaching and learning. The USAID support under this programme for ICT integration at the 19 PTTCs employs the cascade training model to build the capacity of principals, administrative staff and teacher educators. Various courses including basic ICT literacy, user proficiency, network administration and ICT integration into
instruction are offered through this support.\textsuperscript{50} USAID, Multi Choice and other partners also support the MoE/MHES&T with specialized training for student teachers on how to use digital satellite technology to support and enhance learning and teaching. This initiative integrates traditional teaching with digital lessons and is geared towards practical learning.

The School of Education at the Kenyatta University and the Colleges for Secondary Education, which mainly train teachers for secondary education, have introduced a course for ICT as a specialization. In this arrangement, students are able to take ICT as a 2\textsuperscript{nd} teaching subject (e.g. Maths and ICT; Language and ICT). The delivery of ICT as a course under the BEd Science programme as of September 2009 will be made possible through a collaboration between the Computer Science department in Kenyatta University and the School of Education.

Kenyatta University has an e-Learning Coordinating Centre and Institute of Open Learning. The e-Learning Centre’s objectives are amongst others to develop e-content for university courses, develop the capacity of teaching staff in the general use of ICTs and the development of e-learning programmes. With the support of the Ford Foundation, there are thousands of distance learning students and the coordination of their learning is done from the e-Learning Centre. It was noted during the interview with the Dean of Education that the high cost of bandwidth continues to be a constraint to the e-Learning programmes. The use of e-Learning in the delivery of its courses not only exposes the student teachers to the possibilities of technology enabled learning but also makes it possible to produce more teachers outside the physical limitations of the college environment by reaching more learners.

\textbf{In-Service training (INSET)}

Findings of the Situational Analysis indicate that the professional development of existing teachers to enhance their ICT skills and build capacity to use and integrate ICTs in teaching and learning is being carried out through private sector partners - the Microsoft Partners in Learning Programme (PIL), and the Intel Teach programme. These programmes target the in-servicing/training of primary school teachers in ICT skills. MoE in partnership with VVOB, a development partner, and CEMASTEA plans to roll-out a nationwide programme to in-service all secondary school teachers with ICT and ICT integration skills. NGOs that have provided computers to schools have been running courses for practicing head teachers in ICT literacy and ICT teachers in technical hardware and maintenance. CFSK provides support to schools through capacity building at the user, technical, administrative and decision-making levels.\textsuperscript{51}

MoE officials reported that in-service training of primary school teachers on ICT literacy is currently being conducted under the Intel Teach programme. Whereas the MoE recognizes and appreciates ICTs as would-be good instruments in teacher professional

\textsuperscript{51} \url{http://www.idrc.ca/fr/ev-83049-201_103429-1-IDRC_ADM_INFO.html}
development, logistical details to effectively implement programmes utilizing ICTs, funding, and lack of trainers with the requisite skills were cited as the main challenges.

5.3 ICTs and Educational Management

5.3.1 ICTs for Administration

It was acknowledged by the Directorate of Policy and Planning in the MoE that there were many infrastructural limitations to the integration of ICTs into schools. It was reported that at this stage the emphasis was on ICT investments in administrative support services and as a result 205 computers have been delivered to District Education offices. The intention is also to place 5 computers for EMIS purposes in every District Education office especially with the recent increase in the number of districts to over 250. This is in line with the DEG’s mandate of improving the delivery of government services to the citizens.

The Kenya Education Staff Institute (KESI) is mandated to provide training for ICT integration in administration to educational managers for schools, TTCs and TIVET institutions. KESI has 2 computer rooms that have been set aside as future computer laboratories. Currently computers for training are usually hired at a commercial rate which pushes up the cost of training considerably. The KESI director reported that the cost of accommodation and travel during the training of education managers takes the largest percentage of the training budget. The concept of distance education in the delivery of their courses was considered as one that would stretch their training budget considerably and reach more participants but this is a move that would require a change of policy in the delivery of education.

In a bid to address the challenge of facilitators not being well-grounded in ICTs, within KESI, the Kenya e-Learning Centre (KeLC) in collaboration with the Namibian e-Learning Centre and inWEnt have been rolling out e-learning capacity development courses (i.e. online tutoring, e-Learning technology, content development and course production, Instructional design, e-Learning management). The capacity development programmes delivered by the KeLC focus on the use of open source tools. This enables resource constrained institutions to effectively develop e-content leveraging open source tools.

5.3.2 Education Management Information Systems (EMIS)

Although the MIS department under the Ministry of Education should oversee all EMIS related activities in Basic and Higher Education, it was reported that the module for higher education (Universities and TIVET) is under construction. This came about as the existing modules for these sectors did not adequately address their needs. The emphasis of the EMIS department has been on basic education with the components of primary, secondary and teacher training institutions.

The Ministry of Youth Affairs indicated that the EMIS system within their ministry needs strengthening by setting up structures to ensure the system operates effectively. Their system will be known as the Youth Information and Management System (YMIS).
EMIS is one of the investment programmes under the KESSP. According to the head of the EMIS section, district offices have been provided with 5 computers each to enable them capture the data from the regions. It was reported that education administrators would be trained in the use of EMIS for data capture. This seems to be a duplication of functions as the Kenya Education Staff Institute is mandated with the training of education managers which would include EMIS training. Another challenge that was cited in the implementation of EMIS was a lack of an administrative framework to support the effective implementation and coordination of the various EMIS components.

5.4 Monitoring and Evaluation

Since KESSP provides the framework for support to the education sector for the period 2005-2010, it is worth mentioning again that Monitoring and Evaluation is one of the components under KESSP. An Investment Project Team Leader (IPTL) evaluates all KESSP projects as every project has an M&E component. Findings from the interviews indicate that the IPTL reports on regular occasions to the donor group on the progress made during the meetings of the EDCG.

In its efforts to decentralize functions, the MoE has cascaded monitoring and evaluation of programmes, quality assurance, and capacity building of officers to the provincial and district levels.

5.5 Major ICT initiatives, partners and partnerships

There are various projects/initiatives currently being implemented through various partnerships within the sector. The table below summarizes the details of these projects:

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Implementing agency/partners</th>
<th>Activities</th>
<th>Results to date</th>
</tr>
</thead>
<tbody>
<tr>
<td>School Computerization project (213 schools)</td>
<td>MoE</td>
<td>213 schools were provided with funds by the Ministry of Education for school computerisation. This involved not only Hardware acquisition but also content provision, networking and training. It was a one-time project as the funding was drawn from the Exchequer.</td>
<td>Mixed reactions were registered in the implementation project with different levels of success. A recent survey revealed a lack of clear monitoring and evaluation guidelines.</td>
</tr>
<tr>
<td>NICE</td>
<td>Rural Schools Project, Computers for Schools Kenya, Hemland,</td>
<td>The Network of Initiatives in Computer Education is a consortium of organizations in the civil and private sectors working in different areas to improve on the delivery of ICT services in schools. Its mission is to strengthen partnerships among ICT stakeholders in the Education sector. The activities of the NICE members include refurbishment of computers, standards and policies, regional allocation to NICE members, quality assurance, publicity and PR, and</td>
<td>NICE is not active at the moment but the two main stakeholder organizations (CFSK and Rural Schools Project) are still deploying computers in schools.</td>
</tr>
<tr>
<td>Initiative</td>
<td>Implementing agency/ partners</td>
<td>Activities</td>
<td>Results to date</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------</td>
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</tr>
<tr>
<td>ICT Integration in Pre-Service Teacher Training in Primary Teacher Training Colleges under the leadership of USAID – (2006 – 2012)</td>
<td>KIE with support of USAID in partnership with CISCO INTEL Microsoft Mindset</td>
<td>USAID- provides CISCO- Networking of TTCs under USAID funding. Providing content for the training of technicians Intel has provided Intel Teach – curriculum for use in the TTCs. The curriculum has been aligned by thorough the vetting process in KIE. Microsoft’s curriculum is also being used in the TTCs and has been vetted by KIE Mindset-is involved in the TAFAKALI Project through which digital content is currently being developed for primary schools by KIE in partnership with MINDSET.</td>
<td>Approval has been provided for the procurement of the Networking equipment for all the TTCs. Some equipment already installed and training done. Digital content for secondary schools was launched in August 2009</td>
</tr>
<tr>
<td>ICT integration project within KESSP. 2008 – 2013 in two phases; phase 1, – 2008 – 2010 and phase 2, 2011-2013</td>
<td>VVOB</td>
<td>The objective is to strengthen ICT integration in education and administration through direct collaboration with implementing partners (KESI &amp; CEMASTEIA).</td>
<td></td>
</tr>
<tr>
<td>ICT Trust Fund</td>
<td>Private-Public- Partnerships Kenya Pipeline Corporation, Barclays Bank, Safaricom,</td>
<td>Each member has been contributing 0.5 million Kshs (€5,000) This funding has mainly been channelled through Computers for Schools and Rural Schools project.</td>
<td>Currently the ICT Trust Fund is not as active. 200 schools may have received computers through the trust.</td>
</tr>
<tr>
<td>NEPAD e-schools project</td>
<td></td>
<td>A programme of the African Union A multi-partner demo project that equipped 6 secondary schools with state-of-the art ICTs and provided teacher training and learner content.</td>
<td>6 schools were provided with 20 high-end computers, VSAT connectivity, Local Area Networks, Software and digital content from LearnThings</td>
</tr>
<tr>
<td>KIE School Broadcasting Program</td>
<td></td>
<td>Radio broadcasts are relayed through the Kenya broadcasting corporation everyday from 8.00 am – 5.00 pm. A program for the broadcasts is normally sent to schools.</td>
<td></td>
</tr>
<tr>
<td>Exam registration and Results on line</td>
<td>KNEC</td>
<td>KCPE and KCSE exam results can now be checked online as well as by SMS. Registration for exams, viewing</td>
<td></td>
</tr>
<tr>
<td>Initiative</td>
<td>Implementing agency/partners</td>
<td>Activities</td>
<td>Results to date</td>
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<tr>
<td></td>
<td></td>
<td>of the subjects a candidate has registered and the selection of candidates to various schools can now be done online as well.</td>
<td></td>
</tr>
<tr>
<td>E-learning for staff development</td>
<td>KESI</td>
<td>KESI drafted an e-learning strategy with the goal of delivering its courses online.</td>
<td>KESI currently undertaking an e-readiness assessment of the institute and will thereafter develop an implementation plan. During this fiscal year 2009/2010 KESI plans to install state-of-the-art ICT infrastructure, including a well-equipped computer lab, new website and LAN.</td>
</tr>
<tr>
<td>KENET Initiative</td>
<td>KENET (funding source MoE, ICT Trust Fund)</td>
<td>Establishment of high-speed internet infrastructure in 22 institutions</td>
<td>22 institutions within 12 months (2007) and 30 tertiary institutions over 2-year period.</td>
</tr>
</tbody>
</table>

Table 8- ICT Initiatives in Education

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52 Meeting with KESI July 2009
6 INSTITUTIONAL CAPACITY

In the effective use of ICTs, it is critical to have government commitment and good policies and strategies and the capacity to realize or deliver on the commitment and strategies. The former are necessary for creating a conducive environment under which capacity in the system can be leveraged. Capacity in this case refers to the institution or organization’s ability to perform and execute. Determining the capacity of an organization or institution (in this case the Ministries responsible for the education and training sector) involves analyzing 6 key factors as summarized in the table below:

<table>
<thead>
<tr>
<th>Capacity component</th>
<th>Items to consider within each component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human resources</td>
<td>Does the organization have enough dedicated staff with required skills and clearly spelled out roles and responsibilities.</td>
</tr>
<tr>
<td>Strategic leadership</td>
<td>Does the organization have a vision, does it have a clearly spelled out mandate, is management and staff aligned to the vision, is there a performance and reward system in place, are structures appropriately developed for effective and efficient execution</td>
</tr>
<tr>
<td>Financial resources</td>
<td>Is there budgetary allocation within the organizations and from the parent Ministries, are disbursement procedures clear and supportive.</td>
</tr>
<tr>
<td>Infrastructure and technology</td>
<td>Are there physical and technological resources in place to support the activities to be carried out</td>
</tr>
<tr>
<td>Process and programme management</td>
<td>Are there organizational processes relevant to the project at hand, documentation, knowledge management and sharing processes, criteria for selecting schools for deployment of computers etc.</td>
</tr>
<tr>
<td>External environment</td>
<td>Is the overall policy and regulatory environment favourable, is there political commitment, are there multi-stakeholder partnerships in place</td>
</tr>
</tbody>
</table>

Table 9- Factors involved in institutional capacity

In the sections that follow, a cursory attempt is made to assess the existing institutional capacity to manage and implement ICT in Education activities at the Ministries responsible for education and training. This is by no means a comprehensive capacity audit but simply an overview of the existing capacities. If and when GeSCI does engage with the MoE and other educational institutions, a thorough capacity audit would have to be done in order to ascertain the capacity gaps and devise appropriate strategies with the key actors to address these gaps in the short and medium term.

6.1 Government commitment to ICTs

Government and political commitment to ICTs is a critical success factor in the bid to use ICTs for development. Without government commitment, it is difficult to create conducive environments (political, legal, and regulatory) for ICTs to flourish. In the case of Kenya, there is clear evidence that the government is committed to the exploitation of ICTs for development and education. In this regard the government provides incentives to the business sector to stimulate ICT related activities. In its efforts to deepen infrastructural development and to encourage and support the growth of ICTs, the government will allow, among others, internet providers to offset against their taxable incomes over a period of 20 years the cost incurred in acquiring the right to use the fibre

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optic cable, provide tax deduction of 5% on computer software and will exempt from VAT all telephones for cellular or wireless networks (Budget Speech, 2009).

All the major strategy and policy documents of the government and the education and training sector emphasize the role that ICTs could play in this sphere. Examination of the various policy documents reveals that Kenya recognizes the central role of ICT and e-learning in human development and ICTs are seen to be indispensable in the process of becoming part of the global information and knowledge society. The Kenyan government put in place policy and strategy frameworks and identified priority interventions. A brief review of the key government development and education policies and plans, presented in Annex 2 highlights the government’s thinking about and commitment to ICTs.

6.2 ICT Policies and Strategies

The major national plans and education sector policies recognize the role of ICT in education and development and as a universal tool in education and training. It is clear from the national plans and policies that the government has a vision for ICTs and understands the role that ICTs can play in development: as a sector in its own right with tremendous growth and employment creation opportunities, and as an enabler and catalyst for the provision of more efficient and effective social services including education. As Farrell (2007) indicates an ICT policy framework and implementation strategy with measurable outcomes and timeframes exist. Equally important, as far as could be ascertained all the ICT related policies and strategies were developed in consultative and collaborative manner bringing together government agencies, the NGO and private sector.

The Ministries responsible for education and training also understand the potential of ICTs. The MoE in particular has spelled out a clear vision for the use of ICTs and to a lesser extent so have MHES&T and MOYAS. Part of the challenge is that there is no unified cross-sectoral vision and policy nor is there coordination of strategies and activities.

While the sector and a number of partners have taken up some of the priority areas identified in the policies and strategies progress could be accelerated significantly with well-articulated and coordinated cross-sectoral implementation plans with clearly identified goals, objectives, activities, roles and responsibilities, timelines and accountability measures.

A brief review of the national and education sector policies is undertaken in Annex 2 to determine how ICTs are treated in relation to education and training.

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6.3 Human Resources

The sustainable management and implementation of ICT in Education programmes requires dedicated and skilled professionals with skills in Information Technology (IT), Educational Technology, curriculum development and assessment, pedagogy, educational psychology, Project Management and Monitoring and Evaluation among others. A key problem identified in many developing countries is that there is no staff specifically responsible for ICTs in Education, and where there are, they are most likely to be IT professionals without any education or management qualifications, skills and/or experiences.

Lack of capacity at all levels to integrate and use ICTs effectively has been expressed as a major concern throughout the Situational Analysis exercise and extracted from documents. The quality and quantity of the national ICT human capacity in strategic areas (policy formulation and planning, EMIS, e-learning, TPD using ICTs, curriculum and assessment, research) across the education sector need to be strengthened comprehensively and systematically. A detailed human capacity audit would need to be conducted at all levels which is outside the scope of this analysis. Nevertheless, a brief discussion of human capacity for the central government ministries and key SAGAs follows.

All the relevant ministries and SAGAs appear to have dedicated personnel responsible for ICTs usually under an “ICT unit” or department reporting directly to the top management and leadership. A brief review of the ICT human resources of the various ministries follows:

- **MoE:** It was noted that there is one ICT unit with the ICT in education unit being under formation at the time of writing this report. The former consists of 12 ICT officers who are all employees of the DEG and almost all are IT professionals. The ICT Integration team (which draws it members from the various directorates and Development partners), oversees, coordinates and harmonises all ICT initiatives within MoE.

- **MHES&T:** There are five staff members who are in-charge of the ICT infrastructure in the MHEST. They are on secondment from the Directorate of e-Government. 2 members of staff are designated to deal with all matters related to ICT for Education.

- **MOYAS:** In the MOYAS, it was reported that the ICT in education unit does not exist and the ICT unit carries out its duties according to the mandate described in Section 5.3.4. However, even the ICT unit is said to have insufficient staff to take care of the headquarters and district offices.

It was not possible during the Situational Analysis to ascertain what the skills mix within these units are. A more detailed capacity audit would need to be conducted to determine what skills are available and what skills would be required to make the units function optimally.
Some of the SAGAs such as KIE, KESI, and KNEC have dedicated ICT in Education staff and structures that accommodate the ICT component of their operations. Such structures have also ensured that these ICT components are eligible for funding.

6.4 Strategic Leadership and Management/Organizational structures

To translate vision and policy into activities requires appropriate organizational structures, with the right human resources and skills sets. The structures for the 3 ministries are reviewed below.

“Good practice” indicates that a unit consisting of IT professionals specifically attending to the IT systems, networks and infrastructure should be coupled with another responsible for ICT integration concentrating on integrating ICTs in the teaching and learning comprehensively to achieve learning objectives and to improve access, quality, equity and relevance. A cross-departmental or cross-organizational steering committee is also usually highly recommended. Only the MoE seems to have such a provision (see summary table below).

<table>
<thead>
<tr>
<th>“Good practice” organizational structures</th>
<th>IT unit dedicated to internal ICT systems</th>
<th>ICT in Education unit dedicated to integration in education</th>
<th>Cross-organizational or cross-department steering committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>MoE</td>
<td>Yes</td>
<td>Under formation</td>
<td>Yes</td>
</tr>
<tr>
<td>MHEST</td>
<td>Yes</td>
<td>Two dedicated staff members</td>
<td>No</td>
</tr>
<tr>
<td>MOYAS</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>MLHR</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 10- ICT management structures

As can be seen from the table above, all government ministries have ICT Units which have been designated as the implementation and operational focal points for the e-Government Strategy. The ICT units are under the Directorate of E-Government in each Ministry with a mandate of modernizing government operations and services. The ICT unit in each Ministry is mandated to offer infrastructural support to the headquarter ministry and to the regional offices as well. However this was reported to be a big challenge especially in relation to staffing, office space allocation and technical capacities of the personnel in the units. These units usually report directly to senior management (usually PS or ES). Each ICT Unit is responsible for systems implementation, user training and technical support services, taking into account the peculiarities of individual ministries while being able to integrate with the government-wide framework. Duties and responsibilities of ICT Units in Ministries include:

- Act as a Secretariat to the Ministerial E-Government Steering Committee.
- Provide technical support relating to the acquisition, development, management and other ICT resource decisions in compliance with officially mandated technical standards provided by the e-Government Directorate.

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- Provide technical and operational support for systems and infrastructure including networks, websites, email systems, databases and ministry-specific applications.
- Provide ICT technical user support and training on relevant software packages.

**Ministry of Education**

The MoE has developed formal structures for dealing with ICTs. There is one departments or unit (with the ICT in education unit being under formation at the time of writing the report) and a cross organizational steering committee that deal with ICTs. The table below summarizes the mandate and current status of each structure.

<table>
<thead>
<tr>
<th></th>
<th>The Ministerial ICT Steering Committee</th>
<th>ICT Unit</th>
<th>ICT Integration Team</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mandate</strong></td>
<td>The committee was set up to:</td>
<td></td>
<td>Oversees, coordinates and harmonises all ICT initiatives within MoE</td>
</tr>
<tr>
<td></td>
<td>• Coordinate and monitor the</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>implementation of the ICT in</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Education strategy.</td>
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<tr>
<td></td>
<td>• It is also supposed to approve</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>projects and programmes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>under the strategy.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Staffing/composition</strong></td>
<td>Composed of all stakeholders.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Chaired by the</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Permanent Secretary and supported by</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>the Ministry’s ICT unit as the</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>secretariat.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Reporting</strong></td>
<td>Supposed to meet</td>
<td>The unit has a head or manager with 14 ICT officers who are all employees of the DEG. It is resourced through DEG support, private-public-partnerships and development partners.</td>
<td>Reports directly to the Permanent Secretary and Education Secretary</td>
</tr>
<tr>
<td></td>
<td>monthly and report</td>
<td></td>
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<tr>
<td></td>
<td>quarterly on progress</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Directorate of Secondary Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directorate of Basic Education</td>
</tr>
<tr>
<td>Quality Assurance</td>
</tr>
<tr>
<td>Directorate Policy and Planning</td>
</tr>
<tr>
<td>Adult Education</td>
</tr>
<tr>
<td>CEMASTEA</td>
</tr>
<tr>
<td>KESI</td>
</tr>
<tr>
<td>KIE</td>
</tr>
<tr>
<td>EMIS</td>
</tr>
<tr>
<td>ICT Unit</td>
</tr>
<tr>
<td>VVOB</td>
</tr>
</tbody>
</table>

Table 11- Mandates and status of ICT management structures

Interviews with officials during the course of the situational analysis revealed that the ICT Steering Committee has not met in the last three years. However, the establishment
of the ICT Integration Team resulted in the latter temporarily taking up the role of the ICT steering Committee.

Traditionally, the ICT unit has also been in charge of ICT in Education i.e. integrating ICTs into teaching, learning and management. This is the norm in many MoEs in developing countries but is usually a serious error as organizational ICT and ICT in Education require quite different skills and approaches. However, findings indicate that an ICT in Education unit was under creation at the time of writing this report although there was an officer in charge of the unit at the time under the MoE.

6.5 Financial Resources for ICT

The KESSP considers ICTs as one of the priority investment programmes and caters for financial resources for ICTs. The National ICT in Education Strategy goes further and has detailed costs for all the priority ICT activities. The various ministries responsible for the Education and training sector have all provided some form of dedicated resources for the purchase of ICTs at the various institutions. Funds are generally disbursed to the educational institutions. However, it is not clear if there are dedicated budget lines for ICTs for every financial year or if the financial resources are allocated as and when there are funds. The MoE seems to be the only ministry that has developed fairly comprehensive plans for financial resource acquisition and allocation. A brief treatment of the various ministries follows.

MoE

According to interviews, the Ministry of Education disbursed Kshs 319.5 million (€3.195 million) to 213 selected secondary schools in all the former 71 districts in 2005/2006 and 2006/2007 financial years. Each beneficiary school received Kshs 1.5 million (€15,000) to purchase ICT equipment which consisted of:

- 25 computers
- a printer
- digital content as provided by selected vendors
- Sensitization on technical maintenance but intensive training was to be organized outside this budget allocation.

The Kenya ICT Trust Fund, a key component of the ICT strategy, was constituted as a mechanism for acquiring ICTs (mainly computers and related equipment). The ICT Trust is a registered consortium in the form of an NGO that brings together many partners from the public, private and civil society sectors. The Trust Fund was formed by public private sector corporates in Kenya out of the realization for the need of coordination and harmonization of contributions towards ICT in education. The main objective of the Trust is to facilitate private public partnerships to mobilize funds to provide ICT resources (including computer laboratories in all secondary schools in 4 - 5 years) to Kenyan public schools and community learning centres.

The Chairman of the Trust Fund is the Permanent Secretary of the MoE. The current membership of the consortium includes the Government of Kenya (GOK) through the MoE, Communications Commission of Kenya (CCK), Kenya Electricity Generating
Company (KENGEN), Microsoft Corporation, Kenya Airways (KQ), Kenya Airports Authority (KAA), East African Standard, TelKom Kenya limited (TKL), Postal Corporation of Kenya (PCK), Kenya Pipeline Corporation (KPC), Kenya Revenue Authority (KRA), Kenya Ports Authority (KPA), Safaricom Limited, Barclays Bank of Kenya (BBK), and Network Initiatives of Computers in Education (NICE) as the implementing arm of the consortium. The ICT Trust Fund, under the auspices of the Ministry of Education, developed two educational papers: the *Kenya ICT Trust Fund Blueprint* and the *National ICT Strategy for Education and Training*.  

**MOYAS**

According to interviews with officials from MOYAS, there are no dedicated funds for ICTs although the officials indicated that funds allocated for the purchase of tools and equipment could be used to buy ICT equipment.

### 6.6 Resourcing of ICT Units in Sector Ministries

This component of capacity aims to determine whether ministries have allocated sufficient and appropriate physical and technological infrastructure to the ICT units.

It was reported during the interviews that some of challenges in the ICT units are centred on technical capacities, space allocation and infrastructure. The Local Area Networks in the interviewed ministries have been installed in all government offices and in 81 districts countrywide. It was reported however that this infrastructure is currently underutilised, has inadequate bandwidth and internet services are unreliable. This situation is magnified as one moves further into the regions where infrastructural challenges were reported to be huge.

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7 GAPS AND CHALLENGES

In order for ICTs to be effective and realize their potential, three key issues need to be addressed:

- ICTs must respond directly to and their use and deployment be guided by key educational objectives, priorities and challenges
- ICT deployment and integration must take into consideration the end-to-end or complete eco-system
- Capacity issues at all levels must be addressed.

For the purpose of the situational analysis the challenges in these three domains are examined. Examination of capacity constraints will be limited to the sector Ministries as this is the level at which GeSCI works.

7.1 Response to key educational challenges

ICTs offer great hope for improving access, quality and efficiency of education, but there is a need for policy makers to understand the key issues underlying the educational problems and to formulate sensible strategies using ICTs and other tools and mechanisms to overcome the problems.

ICTs have the potential, if used appropriately, to address some (but not all) of the major education challenges of access, equity, quality and relevance. However, ICTs are only tools and it would be unwise to begin with ICT solutions and search for educational and instructional problems that can be solved by those solutions. ICT-enhanced education activities should not be perceived as a substitute for regular teaching or for conventional institutions, but as enriching, enhancing, improving and expanding conventional delivery systems for improved achievement. There is a need for policy makers to understand the key issues underlying the educational problems and to formulate sensible strategies using ICTs and other tools and mechanisms to overcome such problems.

The different ICT strategies and policies clearly link ICTs to the sector challenges. However, there are still challenges and gaps in implementation. These challenges and gaps are briefly examined in the table below.

<table>
<thead>
<tr>
<th>Causes/key issues/challenges</th>
<th>How ICTs can address challenges</th>
<th>Progress made using ICT to address</th>
<th>Gaps/challenges in using ICTs</th>
</tr>
</thead>
</table>
| Access                      | • Lack of adequate physical infrastructure  
• Low transition rates from primary to secondary and to higher education levels  
• Drop-out rates (cumulative drop-out rates in primary education at 37%) | • Alternative delivery systems using ICTs e.g. online-learning (web technologies), m-learning (mobile technologies), radio and TV used for distance  | • Massive investment in national ICT infrastructure (e.g. NOFB)  
• Prominence given to ICT in Education in 2009/2010 national budget  
• Acquisition of equipment | Efforts still very limited and uncoordinated yet ICTs have high potential. May be attributed to:  
• Lack of clear policies and strategies for open and distance education  
• Limited understanding |
<table>
<thead>
<tr>
<th>Causes/ key issues/ challenges</th>
<th>How ICTs can address challenges</th>
<th>Progress made using ICT to address</th>
<th>Gaps/ challenges in using ICTs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher shortages and inefficient management, deployment and distribution of teachers</td>
<td>Learning to train more teachers, and for increase access especially at higher levels</td>
<td>through government and partner funding</td>
<td>and awareness of alternative delivery systems and options</td>
</tr>
<tr>
<td>Lack of clear policies at ECE level and for children with special needs</td>
<td>Provide for personalized and diversified learning</td>
<td>Kenyatta University has established e-Learning Centre and developed e-learning courses</td>
<td>Enormous investments required for appropriate models of ICT integration</td>
</tr>
<tr>
<td>Nomadic way of life and children having to supplement family income in certain areas</td>
<td>Electronic databases of teacher specialization, qualifications, experience, etc. facilitating teacher distribution and deployment and tracking professional development</td>
<td>KESI and other institutions also considering e-learning to train educational managers</td>
<td>ICTs available in schools not well-maintained and limited technical support- not used</td>
</tr>
<tr>
<td>Cultural beliefs in some areas reducing girls’ access</td>
<td>Rising number of orphans</td>
<td>KIE launched digital content for schools in August 2009</td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>ICTs in open and distance education used for continuous teacher professional development and training more new teachers</td>
<td>E-learning capacity development courses offered by KeLC in conjunction with other partners</td>
<td></td>
</tr>
<tr>
<td>Inadequate teacher preparation</td>
<td>ICTs used to create and deliver rich teaching and learning content</td>
<td>About 20% secondary schools, all public TTCs, some TIVET have ICTs</td>
<td></td>
</tr>
<tr>
<td>Teacher shortages (especially in Maths, the Sciences, English and Kiswahili) and inefficient deployment of teachers</td>
<td>Poor performance in core subjects like Maths and the Sciences</td>
<td>KIE creating content for schools and TTCs</td>
<td></td>
</tr>
<tr>
<td>Over-loaded</td>
<td>Lack of coordinated continuous TPD</td>
<td>Some use of radio and m-learning to support TPD but limited</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Over-loaded</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Kenya ICT in Education Situation Analysis
<table>
<thead>
<tr>
<th>Causes/ key issues/ challenges</th>
<th>How ICTs can address challenges</th>
<th>Progress made using ICT to address</th>
<th>Gaps/ challenges in using ICTs</th>
</tr>
</thead>
<tbody>
<tr>
<td>curricula at all levels</td>
<td>ICTs can enable teachers to deal more effectively with large classes e.g. keep one group of students engaged while teacher works with another</td>
<td>Ministries purchasing ICTs for administration</td>
<td>school level</td>
</tr>
<tr>
<td>Poor resource management</td>
<td>ICTs used to interest and motivate students through multi-media content</td>
<td>DEG placing equipment for EMIS in all districts to facilitate data capture and storage</td>
<td>ICT integration into teaching and learning not yet achieved</td>
</tr>
<tr>
<td>Overcrowded classes and high student: teacher ratios</td>
<td>ICTs when properly used can facilitate acquisition of 21st century skills</td>
<td>Equipping teachers with ICT skills through both pre-service and in-service modes supported by development and private sector partners</td>
<td>Higher education institutions not ready to use ICTs effectively (KENET e-readiness report)</td>
</tr>
<tr>
<td>Lack of adequate quality teaching/learning materials</td>
<td>ICTs (e.g. simulations) used to explain difficult concepts and demonstrate difficult processes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TIVET institutions: disparities in training standards and inadequate training of instructors and no ICT integration roadmap</td>
<td>ICT can be used to strengthen administration and management processes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender insensitive environments</td>
<td>Assistive technologies for special needs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inadequacies in quality assurance mechanisms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focus on skills training rather than on development of 21st century skills: higher order thinking, creativity, collaboration, communication, analysis, etc.</td>
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</tr>
</tbody>
</table>

**Equity**

<p>| Overstretched school facilities and high student: teacher ratios especially in urban | ICTs can support special needs through assistive technologies | Emphasis of Vision 2030 on science, technology and innovation | Lack of adequate infrastructure (equipment, electricity, facilities, |
| ICTs can support special needs through assistive technologies | | | |</p>
<table>
<thead>
<tr>
<th>Causes/ key issues/ challenges</th>
<th>How ICTs can address challenges</th>
<th>Progress made using ICT to address</th>
<th>Gaps/ challenges in using ICTs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• slums, rural and ASAL areas.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• High pupil; textbook ratios in urban slums and rural areas</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>• Barriers for those with special needs: inappropriate infrastructure, inadequate facilities, lack of teacher capacity and lack of coordination among service providers.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>• Special schools only cater for hearing, visual, mental and physical challenged children, leaving other disabilities unattended</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• TIVET: limited linkages and articulation between programmes and institutions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Regional gender disparities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Inefficient and ineffective management of institutions</td>
<td>• ICTs can support mainstreaming of students with special needs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Quality and cost-effective digital content</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ICTs can facilitate alternative delivery methods reducing load on formal institutions</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• E-learning and on-line and ODL delivery modes to train special education teachers and TIVET instructors</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ICTs can facilitate sharing, collaboration and joint planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ICT – enabled tracking systems and databases</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ICTs can improve efficiency of management processes</td>
<td>• Provincial workshops at provincial headquarters for production of assistive devices for special education institutions</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Upgrading of national polytechnics to university status to offer courses in technological fields</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• With ADB support development of new TIVET institutions</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Intention to construct a secondary school of excellence in every constituency</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Purchase of digital laboratory bus to be made for each constituency to promote e-learning</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 10 Youth Polytechnics received computers- to be used as pilot centres for new curriculum</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• KIE developed alternative version of the digital content to be used by schools</td>
<td>• connectivity) especially in rural institutions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Inadequate budgetary allocation for ICT integration</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Marginalization of certain groups continues and deprived students/institutions not benefiting from the new technologies</td>
</tr>
<tr>
<td>Causes/ key issues/ challenges</td>
<td>How ICTs can address challenges</td>
<td>Progress made using ICT to address</td>
<td>Gaps/ challenges in using ICTs</td>
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</tr>
<tr>
<td><strong>Relevance</strong></td>
<td>Inclusion of ICT skills in curriculum</td>
<td>• Intention to establish ICT Centre of Excellence to stimulate innovation and good practice</td>
<td>• Re-training of graduates may be required which incurs extra cost</td>
</tr>
<tr>
<td></td>
<td>ICT based delivery of rich content and demonstration of “best practice”</td>
<td>• Digital Villages project will provide each constituency with 8 computer workstations and training in entrepreneurship</td>
<td>• Return on educational investments low</td>
</tr>
<tr>
<td></td>
<td>ICTs support 21st century skills development</td>
<td>• ICTs can provide “just-in-time” rather than “just-in-case” learning</td>
<td>• Inclusion of ICT skills in curriculum</td>
</tr>
<tr>
<td></td>
<td>ICTs can provide “just-in-time” learning</td>
<td>• ICT-based learning provides for anytime, anywhere learning - not confined to classrooms</td>
<td>• ICT based learning provides for anytime, anywhere learning - not confined to classrooms</td>
</tr>
<tr>
<td></td>
<td>ICT-based learning provides for anytime, anywhere learning - not confined to classrooms</td>
<td>• Through ICTs life-long learning opportunities available</td>
<td>• ICT tools can facilitate research and development for innovation and development</td>
</tr>
<tr>
<td></td>
<td>Through ICTs life-long learning opportunities available</td>
<td>• ICT tools can facilitate research and development for innovation and development</td>
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<td>ICT tools can facilitate research and development for innovation and development</td>
<td>• ICT tools can facilitate research and development for innovation and development</td>
<td>• ICT tools can facilitate research and development for innovation and development</td>
</tr>
</tbody>
</table>

| **Outdated curricula not facilitating knowledge and skills required by knowledge economy** | | | |
| **Not responsive to market and to national priorities i.e. mismatch between economic and societal demands and offerings at educational institutions** | | | |
| **Outmoded methodologies not fostering 21st century skills** | | | |
| **Private sector not sufficiently involved in design and development of courses** | | | |
| **Insufficient needs analyses** | | | |
| **Inadequate quality assurance mechanisms** | | | |

Table 12- Major education challenges and how ICTs could address them

### 7.2 ICT deployment and integration

A holistic approach to ICT integration goes beyond the technological dimension. International best practice[^58] shows that the end-to-end model which addresses the key

components of policy and planning, infrastructure and deployment, curriculum and content, training and usage, maintenance and support and monitoring and evaluation provides for a comprehensive approach and an enabling environment for ICT integration. Adequate physical and technological infrastructure as well as human resources in critical professional areas, is necessary pre-conditions for effective deployment and integration. Research shows (Fellenz & Brady, 2007) that there are persistent shortcomings in organizational abilities to deploy and exploit ICTs successfully, as deployment is often not aligned with the needs and demands of clients. The education and training sector in Kenya needs to examine different models of ICT deployment and integration in order to maximize the potential that such technology use can bring to the sector. The key challenges and their implications are briefly analysed in the table below against the end-to-end components.

<table>
<thead>
<tr>
<th>End-to-end element</th>
<th>Current status</th>
<th>Key challenges/ gaps</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy and strategy</td>
<td>• Policies and strategies have been crafted • Aligned to national development plans and goals</td>
<td>• Lack of unified framework and strategy for whole sector • Lack of coordination among sector ministries and institutions • Capacity to implement existing policies and strategies • Guidance and support to schools to implement strategy</td>
<td>• Ministries and institutions unable to leverage work and strengths of others • Projects could end up duplicating resources leading to wastage • Harmonized implementation would accelerate progress, complement other initiatives and maximise impact • Limited sharing of expertise, experiences and infrastructure especially in deprived areas. • Research shows that institutions with ICT plans and targets are more likely to effectively use ICTs</td>
</tr>
<tr>
<td>Deployment of ICTs in institutions</td>
<td>Institutional e-readiness • Some criteria for institutional readiness • Guidelines and standards for deployment developed by MoE but not circulated and/or implemented • Available ICTs in</td>
<td>Institutional e-readiness • No data on e-readiness, no baseline studies or results of such studies</td>
<td>Institutional e-readiness • Limited ability to plan for ICT deployments with e-readiness data • Limited ability to provide affordable and alternate solutions to institutions • Institutions unable to take advantage of</td>
</tr>
</tbody>
</table>


Kenya ICT in Education Situation Analysis 70
<table>
<thead>
<tr>
<th>End-to-end element</th>
<th>Current status</th>
<th>Key challenges/ gaps</th>
<th>Implications</th>
</tr>
</thead>
</table>
| **ICT equipment and software** | institutions used mainly for basic literacy skills and to teach subject, with only very limited use in teaching and learning process  
- ICT acquisition not prioritized with low allocation of budgets | **ICT equipment and software**  
- High cost of ICT equipment  
- No strategy to explore alternate affordable solutions  
- Guidelines and standards developed but not yet applied  
- Computer lab model only model limiting ICT use primarily to skills training | internet for communication, collaboration and extensive free resources  
- ICTs not used to enrich teaching and learning processes and for acquisition of higher order skills required for 21st century learning |
| **Connectivity and electricity** | Main deployment model computer labs which appear to be “default” model, best suited for skills training  
- About 20% of secondary schools, all public TTCs, universities and some TIVET institutions have ICTs but ICT levels vary across institutions with rural institutions most deprived  
- Less than 40% of available ICT infrastructure in schools used  
- Intention to provide affordable laptops to teachers through loan scheme | **Connectivity and electricity**  
- High cost of bandwidth, limited bandwidth  
- Lack of electricity in rural institutions constrains ICT integration and use  
- Limited exploration of alternative connectivity options | Without dedicated funding from ministries for ICT equipment acquisition sustainability an issue  
- Without educational objectives driving the deployment models ICT resources would not be used optimally  
- Compare and contrast different deployment options based on educational objectives  
- In absence uniform standards and specifications institutions may acquire sub-standard/unfit for use equipment |
| **Connectivity and electricity** | All Universities and public TTCs connected, but very few schools and TIVET centres connected  
- KENET setting up cost-effective, reliable and high speed connectivity for higher education institutions  
- Telecommunications infrastructure improving rapidly with fibre optic networks, 3G cellular services, etc.  
- Efforts to make electricity more widely available in rural Kenya | **Connectivity and electricity** | New developments (e.g. fibre optic cables) and technologies (e.g. 3G connectivity) provide opportunities for alternative and more cost-effective solutions to be harnessed  
- Without integrated planning, e.g. with REA and assisting institutions to go the “last mile” to wire and install electricity , |
<table>
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<tr>
<th>End-to-end element</th>
<th>Current status</th>
<th>Key challenges/ gaps</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>through launch of REA.</td>
<td>• Lack of maintenance and technical support cited as reason for limited use of available ICT infrastructure in schools&lt;br&gt; • Main model used is in-school/in-institution for maintenance and support&lt;br&gt; • In schools maintenance and technical support left in hands of school boards who hire ICT teacher according to guidelines provided by MoE&lt;br&gt; • Higher education institutions have dedicated units to maintain infrastructure and provide technical support</td>
<td>• No comprehensive maintenance and support strategy&lt;br&gt; • National and regional structures for maintenance and support proposed in ICT4E strategy not implemented&lt;br&gt; • Duplication as ICT unit in MoE sometimes also involved in maintenance at school level&lt;br&gt; • With introduction of FSE resistance from parents to pay fees for maintenance and technical support</td>
<td>• Long downtimes for ICTs in schools and TIVET institutions&lt;br&gt; • Can lead to teacher and student frustration/demotivation in using ICTs&lt;br&gt; • ICTs not optimally used e.g. 60% of ICTs in schools are not being used&lt;br&gt; • Wasted investment in ICTs&lt;br&gt; • Mechanisms to support maintenance and to provide technical support especially at rural institutions must be developed and necessary funds allocated for that&lt;br&gt; • Enable TIVET institutions, including Youth Polytechnics to provide maintenance and technical support in rural areas</td>
</tr>
<tr>
<td>Maintenance and Technical Support</td>
<td>• Building ICT capacity at TTCs prioritized&lt;br&gt; • Most teacher education institutions introduced ICT training as part of teacher preparation&lt;br&gt; • ICT as curriculum subject offered at 19 public PTTCs&lt;br&gt; • Various courses including ICT literacy, user proficiency, network administration and ICT integration into instruction offered at PTTCs&lt;br&gt; • At university level ICT as specialization and 2nd teaching subject offered&lt;br&gt; • In-service training of teachers on basic ICT skills and integration of ICTs in teaching and learning</td>
<td>• Lack of coordinated competency framework for TPD with regard to ICT integration and use&lt;br&gt; • Lack of strategy to use ICTs as tools in continuous professional development (e.g. through e-learning and on-line modalities)&lt;br&gt; • Baselines on teacher ICT competencies lacking</td>
<td>• Limited and uncoordinated initiatives can be major barrier to imparting appropriate ICT skills and competencies&lt;br&gt; • External partners determine what teachers should learn and how&lt;br&gt; • Teachers unable to use ICTs to improve their teaching and student learning&lt;br&gt; • ICTs in institutions not used appropriately/optimally&lt;br&gt; • Wasted investment in ICTs&lt;br&gt; • Students more competent and skilled than teachers in use of ICTs</td>
</tr>
<tr>
<td>ICT training for teachers</td>
<td>• Building ICT capacity at TTCs prioritized&lt;br&gt; • Most teacher education institutions introduced ICT training as part of teacher preparation&lt;br&gt; • ICT as curriculum subject offered at 19 public PTTCs&lt;br&gt; • Various courses including ICT literacy, user proficiency, network administration and ICT integration into instruction offered at PTTCs&lt;br&gt; • At university level ICT as specialization and 2nd teaching subject offered&lt;br&gt; • In-service training of teachers on basic ICT skills and integration of ICTs in teaching and learning</td>
<td>• Lack of coordinated competency framework for TPD with regard to ICT integration and use&lt;br&gt; • Lack of strategy to use ICTs as tools in continuous professional development (e.g. through e-learning and on-line modalities)&lt;br&gt; • Baselines on teacher ICT competencies lacking</td>
<td>• Limited and uncoordinated initiatives can be major barrier to imparting appropriate ICT skills and competencies&lt;br&gt; • External partners determine what teachers should learn and how&lt;br&gt; • Teachers unable to use ICTs to improve their teaching and student learning&lt;br&gt; • ICTs in institutions not used appropriately/optimally&lt;br&gt; • Wasted investment in ICTs&lt;br&gt; • Students more competent and skilled than teachers in use of ICTs</td>
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<tr>
<td>End-to-end element</td>
<td>Current status</td>
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<td>Implications</td>
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</table>
| Curriculum and content | **Curriculum** - ICT as subject takes precedence and 948 schools offer it as a subject  
- ICT syllabuses for secondary sector, TTCs, TIVET institutions and at university level available  
- Limited use of ICTs as tools to improve teaching and learning at all levels  
- Registration of examinations in all institutions automated and online activity | **Curriculum** - In most instances teachers not adequately trained to offer subject  
- No frameworks in place to guide the integration of ICTs into teaching and learning  
- Curriculum in its entirety not reviewed | ICTs  
- Lack of content limits usefulness of ICTs to teacher and students  
- Without review and overhaul of curriculum to integrate ICTs, ICT integration will only be add-on and not have the desired transformational impact  
- ICTs not used to develop skills required for 21st century learning  
- Workforce not well prepared for demands of knowledge economy and society |
| Digital content | **MoE decided to develop own content aligned to curriculum**  
- KIE develops digital content for schools following normal curriculum regulation with 2 e-content projects running concurrently  
- Content launched in August 2009  
- Universities have e-Learning Centres which develop digital content and e-learning courses developed | **Digital content** - Current high cost of bandwidth constrains e-learning development |  
- Without appropriate and adequate digital content and the infrastructure for delivery, access and equity issues would remain  
- Resource intensiveness of in-house content development vs. other models which could divert funds from other priority areas |
| Management, monitoring and evaluation | **Emphasis on ICT investments in administrative support services to improve delivery of government services to citizens**  
- KESI mandated to provide training in ICT integration in administration to educational managers for schools, TTCs and TIVET institutions  
- EMIS department in | **Limited use of ICTs for administration**  
- Lack of administrative framework to support effective implementation and coordination of EMIS components  
- Limited M&E of ICT in Education initiatives |  
- Poor administration and management aggravates educational challenges related to equity, access and quality  
- Underutilization of capabilities of ICT tools minimizes impact and is waste of sophisticated and expensive equipment  
- Limited M&E hampers ability to determine if ICTs are |
7.3 Capacity constraints

The notion that ICTs can assist education systems to “leapfrog” development is often expressed. However, the ability of organizations to make significant leaps is often constrained by their current capacity. Capacity to deliver on the national commitment is essential for effective ICT integration and use. The sustainable management and implementation of ICT in Education programmes requires dedicated and skilled professionals with skills in Information Technology (IT), Educational Technology, curriculum development and assessment, pedagogy, educational psychology, Project Management and Monitoring and Evaluation among others.

Lack of capacity at all levels to integrate and use ICTs effectively has been cited as a major concern during the situational analysis. Building the necessary capacity for education transformation and innovation is a complex task. To translate vision and policy into implementable activities requires appropriate organizational structures, with the right human resources and skills sets. The brief examination of institutional capacity in the table below concentrates only on the central sector Ministries, as that is the level GeSCI works directly with.

<table>
<thead>
<tr>
<th>Human resources</th>
<th>Current situation</th>
<th>Gaps/ challenges</th>
<th>Implications</th>
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</thead>
<tbody>
<tr>
<td>MoE</td>
<td>1 ICT unit responsible for the IT infrastructure and systems and an ICT Integration Team. The ICT in education unit is under formation. 12 IT officers in ICT unit who are all employees of the DEG and almost all are IT professionals.</td>
<td>• Initiatives in units largely technology driven as staff consists mainly of IT professionals • Insufficient staff in units resulting in overstretches of such staff • Insufficient coverage of the end-</td>
<td>• Skewed development driven by technology rather than by educational objectives • Inability to leverage ICTs for improvement and development of sector. • Critical areas in ICT</td>
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<tr>
<td>Current situation</td>
<td>Gaps/ challenges</td>
<td>Implications</td>
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</table>
| ICT in Integration Team draws members from the five MoE directorates and development partners. | to-end components of ICT in Education initiatives.  
- Lack of capacity in strategic ICT4E areas e.g. policy formulation, EMIS, e-learning, TPD using ICTs, digital content development. 
- Lack of coherent framework to address capacity gaps | integration not attended to or insufficiently attended to, causing skewed development  
- To avoid that ICT in Education initiatives are largely technology-driven they should be managed by a team composed of education and IT professionals  
- Detailed human capacity audit to identify gaps, map out strategies to address them and to cater for the needs (required mix of skills sets, qualifications, etc.): educational technology, curriculum and assessment, multimedia, educational psychology, project management, M&E, etc.  
- Clear vision shared by all sector Ministries and their associated institutions.  
- Systematic and comprehensive capacity building required in critical areas |
| MHES&T: There are five staff members who are in-charge of the ICT infrastructure in the MHEST. They are on secondment from the Directorate of e-Government. It was reported that there is no personnel dedicated to ICT in Education in this Ministry expect for the Directorate of Technical Education where there are two members of staff.  
MOYAS: It was reported that the ICT in Education unit does not exist and the ICT unit carries out its duties according to the mandate described in Section 5.3.4. However, even the ICT unit is said to have insufficient staff to take care of the headquarters and district offices. |  

**Strategic leadership and organizational structures**  
- Policies and plans in place (e.g. KESSP, National ICT Strategy)  
- MoE spelled out clear vision for use of ICTs; less well-articulated by MHEST and MOYAS.  
- All ministries have ICT departments  
- Only MoE has appropriate structures (ICT unit for internal IT systems; Integration;  
- Although policies and plans in place efforts largely uncoordinated and piecemeal.  
- Ministries have no appropriate structures to effectively handle ICT deployment and integration.  
- Mandates between ICT and ICT4E unit  
- Inability to leverage ICTs to facilitate management of decentralized structures and to improve efficiency of system  
- Organizational structures and cultures not aligned to facilitate ICT integration.  
- Policies and plans not
<table>
<thead>
<tr>
<th>Current situation</th>
<th>Gaps/ challenges</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>steering/ committee/integration team for oversight)</td>
<td>under formation in MoE unclear</td>
<td>implemented/partially implemented</td>
</tr>
<tr>
<td>ICT units do not report to any directorate but report directly to the PS</td>
<td>ICT steering committee dormant as it has not met in 3 years. Its role has been taken up by the ICT integration team.</td>
<td>Scope for confusion, conflict and lack of accountability to host ministry as ICT units report elsewhere</td>
</tr>
<tr>
<td></td>
<td>No unified vision and limited coordination of strategies and activities.</td>
<td>Oversight and M&amp;E not properly executed which impacts on implementation.</td>
</tr>
<tr>
<td></td>
<td>ICT units not affiliated to directorates</td>
<td></td>
</tr>
<tr>
<td></td>
<td>quality assurance and control lacking (budgetary constraints cited as reason)</td>
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</tr>
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</table>

**Financial resources**

- KESSP considers ICT priority investment programme. Funds are disbursed to institutions to purchase ICTs, but not clear if dedicated budget vote heads for ICT integration exist.
- At this stage emphasis on ICT investments in administrative support services through DEG.
- MoE uses various mechanisms to acquire ICTs for schools, e.g. ICT Trust Fund, NICE.
- Support from development partners, private sector and civil society organizations for acquisition of ICTs.
- MOYAS no dedicated allocation for ICT acquisition but uses funds allocated for tools and equipment for ICTs.

- Although ICTs is one of the priority investment programmes in KESSP, the ICT IP was not eligible for funding.
- Under-funding of ICT4E activities.

- Reliance on partners for acquisition of equipment and ICT4E initiatives has implications for sustainability.
- Limited training and infrastructure hindering ICT integration and use.

**Physical infrastructure and technology**

- ICT units are under-resourced.
- Infrastructural challenges are huge in regions.

- ICT infrastructure and systems at headquarters need further improvements.
- ICT infrastructure.

- In effective and inefficient administration and management processes.
- Difficult
<table>
<thead>
<tr>
<th>Current situation</th>
<th>Gaps/ challenges</th>
<th>Implications</th>
</tr>
</thead>
</table>
| and systems at agencies outside the HQ and in regions poor. | communicate and collaborate effectively  
- Lack of timely information for planning and decision making | |
| **Process and programme management** | **Change and programme management skills lacking**  
**Baseline data on ICTs in institutions unavailable** | **Inability to implement strategies-challenges not addressed**  
**Although technologies available, the power and potential of ICT tools for management, data collection and decision making not harnessed for planning, project management and capacity building** |

- EMIS is an investment programme under KESSP: emphasis was on primary, secondary and teacher training institutions, but module for higher education under construction.  
- M&E also a component under KESSP  
- M&E, quality assurance and capacity building of officers cascaded to provincial and district levels |  |
| **External environment** | **Government commitment not turned into action; policies and strategies not fully implemented**  
**Fragmented and piecemeal ICT initiatives** | **Education and training sector lagging behind**  
**ICT capabilities not harnessed for sector development** |

- Dynamic and vibrant external ICT environment-ICTs used in business, banking, etc.; massive mobile penetration; better and more affordable connectivity through sub marine cables; REA roll out electricity to rural education institutions  
- Facilitating regulatory framework Government commitment to ICTs in Education evidenced in policies and plans  
- Recognition of the power and potential of ICTs for attainment of national and educational goals  
- Budgetary provision for national ICT infrastructure |  |

Table 14- Capacity constraints
8 CONCLUSION AND NEXT STEPS

From the situational analysis, it is clear that the Government of Kenya recognizes the central role of ICTs in human development and in the development of a knowledge-based economy as evidenced by the policy documents and national plans. The Government also places emphasis on the development of adequate ICT infrastructure as is clear from the 2009/2010 Budget Speech. The Government has already embarked on a number of initiatives through the e-Government Directorate in the Office of the President, to establish a conducive environment for the use, application and innovation of ICTs to enhance learning, efficiency and improved service delivery across the various public sectors. In this respect e-learning is seen as an important vehicle.

At the sector level, the Ministries responsible for education and training (Ministry of Education, Ministry of Higher Education, Science and Technology and Ministry of Youth) also recognize the potential of ICTs to address some of the challenges facing the sector. The existence of many policies and plans related to ICTs, such as the National ICT Policy and the National ICT Strategy for Education and Training, and the attempts at coordination through various committees, illustrates some concrete steps taken by the sector to come to grips with ICT use and integration. The various interviews with officials from all the Ministries responsible for education and training and their agencies as well as the development partners revealed that there was interest in leveraging GeSCI’s expertise and experience.

It is clear from the various documents consulted and meetings and interviews that there is a definite commitment from the government and the sector towards ICT integration to attain sectoral goals and objectives. What is lacking though is a unified, holistic and comprehensive approach to address cross-sectoral challenges to ensure integrated and coordinated development of the sector with regard to ICT integration. In this respect GeSCI could provide strategic advice and technical assistance to the sector to assist in convening stakeholders to develop an articulated cross-sectoral framework for ICT integration which could spur and accelerate ICT integration. GeSCI could also work with individual Ministries and their agencies in crafting and aligning policies and strategies to the unified framework. GeSCI could also work with the various Ministries and their agencies in addressing the various challenges outlined above and in building capacity for effective management and implementation.

GeSCI engagement with the sector at this point, when the sector and its partners would be reviewing and strengthening several policies and plans (e.g. National ICT Policy, KESSP), has the potential of leveraging the greatest benefit as GeSCI could contribute substantially to awareness raising and capacity building for cross-sectoral ICT integration based on its experience in other countries and other systems.

Developments in the external environment, e.g. the landing and connection of fibre optic cables, the advances of mobile technologies, coupled with the ongoing education reforms
provide significant impetus to ICT integration initiatives as the time for coordinated action is ripe.

8.1 Next Steps
As a first step the Situational Analysis report will be shared with the relevant sector Ministries in September 2009. The following steps are envisaged after the distribution of the report:

Discussions with the sector and its stakeholders
GeSCI proposes to convene a cross-sector meeting of the Ministries, their agencies and other stakeholders including the development partners. At this meeting, the situational analysis would be presented and discussed. Any feedback given would be incorporated into the report and a final report submitted to the relevant Ministries and other stakeholders.

GeSCI will also be available to meet and discuss with each of the Ministries and their agencies or the other stakeholders and development partners if required.

Development of an action plan
If there is interest from the Ministries or other stakeholders, GeSCI will jointly (with the interested party) develop a plan of action which will include scope of engagement, roles and responsibilities, contributions of each party or parties, deliverables of each party. During the development of the plan, discussions will also be held with GeSCI’s donors and the development partners supporting the education and training sector to secure funding. This action plan will be submitted to the relevant Ministry officials or other relevant stakeholders and to GeSCI’s Board of Directors for approval.

Sign an MoU
On approval of the plan by both GeSCI and the other partners, an MoU will be signed and support from GeSCI will commence.

This process is likely to take about 3 months. If agreement is reached and approval obtained preparation and groundwork for engagement is envisaged to start in the first quarter of 2010.
ANNEXES

Annex 1: Summary of meetings and interviews for Situational Analysis

Annex 2: National and Sector policies and strategies

Annex 3: Brief overview of the key ministries responsible for the education and training sector

Annex 4: Documents and sources consulted
Annex 1: Summary of meetings and interviews for Situational Analysis

The following table provides a summary of the meetings and interviews held during the situational analysis (April – September 2009):

<table>
<thead>
<tr>
<th>NAMES</th>
<th>DESIGNATION</th>
</tr>
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<tbody>
<tr>
<td>1. Mr. John Sergon</td>
<td>ICT Director, e-Government Directorate</td>
</tr>
<tr>
<td>2. Mrs. Ondiek</td>
<td>Senior Deputy Director – Secondary Education Ministry of Education</td>
</tr>
<tr>
<td>3. Mr. Kimathi M’Nkanata</td>
<td>Ag. Director, Directorate Policy and Planning Ministry of Education</td>
</tr>
<tr>
<td>4. Mr. John Kimotho</td>
<td>Senior Deputy Director Media and Extension Services Kenya Institute of Education (KIE)</td>
</tr>
<tr>
<td>5. Dr. Wanjiru Kariuki</td>
<td>Director, Kenya Education Staff Institute (KESI)</td>
</tr>
<tr>
<td>6. Dr. Dinah Mwinzi</td>
<td>Director, Ministry of Youth Affairs - Youth Training</td>
</tr>
<tr>
<td>7. Mr. E. Oloo</td>
<td>Unit Head, ICT in Education Ministry of Education</td>
</tr>
<tr>
<td>9. Mr. Charles Obiero</td>
<td>Unit Head, Education Management Information Systems (EMIS) Ministry of Education</td>
</tr>
<tr>
<td>10. Dr. Ogeno</td>
<td>Dean: School of Education, Kenyatta University</td>
</tr>
<tr>
<td>12. Ms. Irene Wanjiru</td>
<td>Ass. Director – Training Ministry of Youth Affairs</td>
</tr>
<tr>
<td>13. Dr Sarah Wright</td>
<td>Director: Office of Education, USAID</td>
</tr>
<tr>
<td>14. Dr Lucy Kithome</td>
<td>Project Management Specialist Education Technology, USAID</td>
</tr>
<tr>
<td>15. Ms. Lut Laenen Fox</td>
<td>Country Programme Manager, VVOB</td>
</tr>
<tr>
<td>16. Dr. Paul Van Otten</td>
<td>Programme Coordinator VVOB</td>
</tr>
<tr>
<td>17. Mr. Dan Njiriri</td>
<td>Chair: Network of Initiatives in Computer Education (NICE)</td>
</tr>
<tr>
<td>18. Ms. Shobhana Sosale</td>
<td>Senior Operations Manager, The World Bank</td>
</tr>
<tr>
<td>19. Mr. Alfred Ojwang</td>
<td>Education Advisor, Canadian Cooperation Office</td>
</tr>
<tr>
<td></td>
<td>Government officials and partners met for Situational Analysis</td>
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</tr>
<tr>
<td>20. Mr. Ng’ang’a Munyu</td>
<td>General Manager: Corporate Planning, Rural Electrification Authority (REA)</td>
</tr>
<tr>
<td>21. Mr. B. Sang</td>
<td>Head of ICT Unit</td>
</tr>
<tr>
<td>22. Fenny Mwakisha</td>
<td>Deputy Director, Ministry of Higher Education Science and Technology</td>
</tr>
<tr>
<td>23. Mr. Lucas Ocharo</td>
<td>Principal Technical Education Officer</td>
</tr>
<tr>
<td>25. Mr. Samuel Waweru</td>
<td>Chief Technical Education Officer</td>
</tr>
<tr>
<td>26. Mr. Angelo Kitonga</td>
<td>Directorate of Adult Education</td>
</tr>
<tr>
<td>27. Ms. Ruth Kyalo</td>
<td>Africa Development Bank</td>
</tr>
<tr>
<td>28. Justus Mwiliedza</td>
<td>Deputy Director (Directorate of Industrial Training)</td>
</tr>
</tbody>
</table>

Table 15- Government officials and partners met for Situational Analysis


Annex 2: National and Sector policies and strategies

<table>
<thead>
<tr>
<th>PRSP</th>
<th>Vision 2030</th>
<th>National ICT Policy</th>
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<tr>
<td>The Government of Kenya’s Economic Recovery Strategy for Wealth and Employment Creation (2003-2007) states that “Government recognizes the importance of Information and Communications Technology (ICT) for improving performance in the productive sectors and Government, and as a potentially fast growing and employment generating industry.”</td>
<td>The <strong>Kenya Vision 2030</strong> plan recognizes the crucial role of ICT and e-Learning for achieving the aim of making Kenya a highly competitive market by the year 2030. To this end strong partnerships, additional financing, good governance and political goodwill are required to spur development and overcome the significant hurdles impeding the growth of the ICT industry in the East Africa Community. It calls for intensified Science, Technology and Innovation (STI) application to raise productivity and efficiency levels. In this regard more resources will be devoted to scientific research, technical capabilities of the workforce and in raising the quality of teaching in mathematics, science and technology in educational institutions. The First Medium Term Plan (MTP) 2008-2012 calls for the establishment of a computer supply programme that will equip students with modern ICT skills as part of the strategy to provide “globally competitive quality education.”</td>
<td>The <strong>National Information and Communications Technology (ICT) Policy</strong>, developed by the Ministry of Information and Communications in January 2006 promotes the growth and implementation of e-learning through a number of strategies that include:</td>
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<tr>
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<td>- Promoting the development, sharing and integration of e-learning resources to address the educational needs of primary, secondary and tertiary institutions</td>
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<td></td>
<td>- Facilitating public-private partnerships to mobilize resources</td>
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<tr>
<td></td>
<td></td>
<td>- Development of integrated e-learning curriculum to support ICT in education and promote distance education and virtual institutions</td>
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<tr>
<td></td>
<td></td>
<td>- Provision of affordable infrastructure to facilitate dissemination of knowledge and skills through e-learning platforms</td>
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<td></td>
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<td>- Promoting the establishment of a national ICT centre of excellence</td>
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<th><strong>Education Sector Policies</strong></th>
<th><strong>ICT4E Options paper</strong></th>
<th><strong>ICT4E policy</strong></th>
<th><strong>Action for Youth and ICT</strong></th>
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<td><strong>KESSP</strong></td>
<td>The ICT in Education Options Paper (2005)(^{62}) states that the scale of the problems and the size of Kenya make it virtually imperative that much of the pressing educational burdens will have to be addressed using approaches that rely on technology to deliver more educational content, and to improve the quality of teaching and student performance. It responds to the educational priorities outlined in the KESSP and Sessional Paper No. 1 of 2005 by spelling out in detail how ICTs could be leveraged to actualize these priorities, tackle challenges and ultimately improve educational outcomes. The paper was developed at the request of the MoE with multi-stakeholder consultation and the support of USAID. The paper is outstanding in two main ways: a) It approaches technology from an educational standpoint i.e. options are driven by education rather than technological capability; and b) ICTs are considered in their broad sense and not just computers. The paper presents and discusses over twenty options or ways in which ICTs can be leveraged to actualize these priorities. It outlines how ICTs “will be adopted and utilized to improve access, quality and equity in the delivery of education services in Kenya”. The strategy outlines “areas of priority” that need to be address for the successful integration of ICTs into education. These priority areas are: Establish policy framework Digital equipment Connectivity and network infrastructure Technical support Harnessing emerging technologies.</td>
<td>National ICT Strategy for Education and Training (2006), also referred to as the ICT policy for the education sector, is meant to “act a guide for investors, partners, implementers and all beneficiaries in the sector.” The strategy takes into consideration the education sector and national development priorities and challenges as outlined in various national and sector policies and strategies. Developed in consultation with a wide range of stakeholders, it outlines how ICTs “will be adopted and utilized to improve access, quality and equity in the delivery of education services in Kenya”. The strategy outlines “areas of priority” that need to be address for the successful integration of ICTs into education. These priority areas are: Establish policy framework Digital equipment Connectivity and network infrastructure Technical support Harnessing emerging technologies.</td>
<td>In the MOYAS plan of Action for Youth and ICT (2008-2012) it is observed that of the 500,000 youth seeking to join the labour force annually, less than 25% are absorbed leaving the rest as either unemployed or underemployed. One of the factors cited to be contributing to unemployment is a lack of requisite ICT skills among most youth graduating from educational institutions. As a result, the plan identifies ICT as an area of focus and one of the 8 strategic pillars for implementation. The ICT PoA acts as a guide for investors, partners and implementers in the sector. The MOYAS strategy recognizes that ICT has become a significant factor of development, having a profound impact on the political, economic and social life of youth. Young people are using ICT to access knowledge, employment opportunities, entertainment, meetings and poverty eradication strategies. To take advantage of the benefits created by ICT, MOYAS intends to use ICTs to create opportunities for youth participation for</td>
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of e-learning delivery systems, building of necessary capacity, development of required ICT infrastructure and institutional management systems.” The objective as expressed in the KESSP document is a noble one but no funding has been allocated to ICT as an investment project.

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<th>Support and improve educational outcomes grouped under 8 broad categories:</th>
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<tr>
<td>Educational Access and Quality through Interactive Radio Instruction</td>
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<td>Quality Teaching and Learning through ICT</td>
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<td>ICT for Skills Development</td>
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<td>Policy and ICTs in Education</td>
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<tr>
<td>Improving Quality and Equity through Connectivity Growth</td>
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<td>Using (and Not Using) ICT to Improve EMIS</td>
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<tr>
<td>Monitoring and Evaluation of ICTs in Education</td>
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<td>Total Cost of Ownership</td>
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| Digital content development |
| Integration of ICTs in education |
| Training (capacity building including professional development) |
| Research and development |
| Partnerships and resource mobilization |
| Legal and regulatory framework, and Monitoring and evaluation. |

| Youth development. |
Annex 3: Brief overview of the key ministries responsible for the education and training sector

Ministry of Education (MoE)

The MoE is responsible for early childhood education, primary, and secondary education. The Ministry’s mandate, amongst other things includes the provision of education at pre-tertiary level, promotion, facilitation and formulation of policy guidelines on education. This Ministry has 3 directorates: (1) Directorate of Basic, Secondary and Adult Education, (2) Directorate of Quality Assurance and Standards, and (3) Directorate of Policy, Planning, Research and Development. The management cadres consist of: Minister, Assistant Ministers, Permanent Secretary (PS) (as accounting officer), Education Secretary and Directors (who report to the Permanent Secretary through the Education Secretary). The heads of the Administration, Human Resource, Finance and Accounting Divisions report directly to the Permanent Secretary. The MoE also oversees a number of semi-autonomous institutions or Semi Autonomous Government Agencies (SAGA). Those SAGAs pertinent to the situational analysis are briefly described below:

Kenya Institute of Education (KIE) is responsible for educational research, designing and developing of curricula for all levels of education and training below the university level; developing learning resources, including books, manuals, and multimedia resources; conducting in-service training of teachers and trainers on new curricula and trends in education; training and conducting dissemination programmes for education administrators, evaluators, book publishers and other stakeholders; and carrying out evaluation of books to assess their suitability. KIE is also responsible for the evaluation of digital content.

Kenya Education Staff Institute (KESI) is responsible for developing capacity of all personnel involved in education management and training including assessing their needs, designing training programmes, developing learning materials and conducting research and evaluation of staff training and development programmes.

Kenya Institute of Special Education (KISE) is an autonomous organization charged with the responsibility of providing relevant curriculum and curriculum support materials in special needs education and for quality assurance. KISE trains teachers on special education needs at diploma level using both distance learning and residential learning modes.

Teachers Service Commission (TSC) is Kenya’s single largest employer. TSC is mandated to register, recruit and employ, assign duties, remunerate, promote, transfer, and discipline teachers. It also compiles, publishes, and amends the code of regulation for teachers. It reviews the standards of education and training and ensures that those entering the teaching profession are appropriately prepared for the various tasks. The commission plays the administrative role of monitoring the status of teaching and learning, and appropriate implementation of the curriculum by providing feedback from its workforce (teachers) to the Ministry of Education, checking the distribution of teachers across the learning institutions and advising the Ministry of Education appropriately.

63 http://www.tsc.go.ke/insidepagesfunctions.htm
Since 1997, the recruitment and employment of teachers has been decentralized to the school and district levels. The commission prepares all emoluments and pays all the teachers. The payroll in 2009 stood at 44.4 billion Kenya shillings per year which is about 3.7 billion Kenya shillings per month.

Kenya National Examinations Council (KNEC). Whereas KIE is the curriculum development agency for the Ministry of Education, KNEC is the curriculum assessment and evaluation body for the same. KNEC is directly answerable to the MoE. It evaluates the entire curriculum developed by KIE. The setting up of the National Assessment Centre within KNEC in 2006 to harmonize all assessment programmes within the education sector has resulted in the development of learning competencies for all classes and subjects to guide the assessment process.

School Education Production Unit (SEPU) is a state corporation under the Ministry of Education with the mandate to design, manufacture, supply and distribute science materials and apparatus for educational institutions. It acts as an agent and stockist of chemicals and drugs, as well as a publisher of materials for the purpose of promoting standards and quality in science education.

Jomo Kenya Foundation (JKF) is Kenya's pioneer publishing house that publishes and prints quality school textbooks and general readers for the approved curriculum. JKF books are used in both primary and secondary schools. Several titles are also available for use in tertiary institutions. JKF is a member of the Kenya Publisher’s Association which among other things promotes and protects the interests of the publishing industry in Kenya, negotiates and enters into agreements with users with regard to photocopying and digital copying of all published work of its members.

**Ministry of Higher Education, Science and Technology**

The Ministry of Higher Education, Science and Technology (MHES&T) is responsible for university education, Science Technology Innovation (STI) Policy, research development, research authorization and coordination of Technical Education (TE) at the post secondary level\(^{64}\). It has three directorates: (1) Directorate of Higher Education; (2) Directorate of Technical Education; and (3) Directorate of Research and Development and one SAGA, the National Council for Science and Technology (NCST). Among its policy priorities is the improvement of quality, relevance, equity and access to higher education and technical training.

Universities and other institutions are expected to build capacity for Business Process Outsourcing (BPOs) and a curriculum is required. The Ministry of Information and Communication has already established a Task Force with representatives from various ministries to look into the skills gap in order to inform the curriculum development process. It is expected that the curriculum will be piloted by January 2010.

Ministry of Youth Affairs and Sports

The Ministry of Youth Affairs and Sports (MOYAS) is responsible for youth development, empowerment, education and training among others. In the education and training sector, the MOYAS oversees Youth Polytechnics (YPs) that provide artisan and vocational training mostly at the post-primary level. With an estimated 500,000 youths joining the jobless ranks each year, the emphasis in education and training within the Ministry is to create employment opportunities. In order to address this issue the Ministry has embarked on a “Youth Employment Marshall Plan”\(^\text{65}\) which aims to create 740,000 jobs for youths each year until 2012. The Ministry also aims to increase enrolment in Youth Polytechnics from 75,000 to 300,000 trainees and is currently in the process of revitalizing and expanding the YPs to offer training in technical, vocational and entrepreneurial skills which will include ICT skills training.

It is worth noting that the MOYAS mandate extends to approximately 750 Youth Polytechnics, 20 National Youth Service Centres and Youth Empowerment Centres.

Subsidized tuition has been provided in the youth polytechnics by the government in 400 youth polytechnics which depends on the level of enrolment to encourage higher enrolment rates since the subsidy is on per student basis. Reports indicate that an e-curriculum has been launched in 50 polytechnics. Further reports indicate that Youth Empowerment centres are currently being created in every constituency which would be one-stop-shops and may be integrated with the Digital Villages.

Ministry of Labour and Human Resource

Vocational training, skill development and employment services provide opportunities for productive synergies in the supply of human resources. Accordingly, the proposed arrangements to bring the operational aspects of vocational training and skill development under the responsibility of the Ministry of Labour and Human Resources and its line departments will contribute to improved effectiveness in both producing and placing the nation's skilled workers.

The Ministry’s mandate through the department of human resources focuses on those training arrangements directly concerned with developing and improving skills for employment. This includes mostly certificate courses, apprenticeships, and short-duration training that offer good prospects for wage employment, or provide a base for self-employment.

Directorate of E-Government

Although not directly responsible for managing the education and training sector, the ICT Director of the DEG indicated that the directorate initiates ICT programmes in different Ministries and that it intended to become more involved in the ICT development of the education and training sector. The Directorate of e-Government (DEG) in the Office of

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\(^{65}\) Article in *Saturday Nation*, “Plan aims to create 740 000 jobs for youth annually”, May 2, 2009, p.5
the President is included here as it plays a supporting role to all line Ministries, including those responsible for education and training.

The achievement of e-Government is one of the main priorities of the Kenyan Government towards the realization of national development goals and objectives for wealth and employment creation. It is believed that effective and operational e-Government would facilitate better and more efficient delivery of information and services to the citizens, promote productivity among public servants, encourage participation of citizens in Government and empower all Kenyans. In this regard ICTs and their applications are seen to be facilitators and drivers of efficiency and productivity. The DEG provides personnel, advice and guidance to all public offices, including to those in the education and training sector.

A new strategy for the DEG is in process which would be finalised in July 2009. The ICT Director of the DEG also indicated that the connectivity backbone to all parts of the country would be in place by end 2009.

Annex 4: Documents and sources consulted


Article in Saturday Nation, “Plan aims to create 740 000 jobs for youth annually”, May 2, 2009, p.5


Information obtained during interview with Directorate of Policy and Planning, 15 April 2009.


Kenya ICT in Education Situation Analysis 91


Meeting with KESI July 2009


Prime Minister and Minister of Finance, Hon. Uhuru Kenyatta to the Kenyan National Assembly delivered on 11 June 2009, p. 3.
