



COMMONWEALTH *of* LEARNING

Learning for Sustainable Development

**A BASELINE STUDY ON
TECHNOLOGY-ENABLED LEARNING
IN THE AFRICAN AND MEDITERRANEAN
COUNTRIES OF THE COMMONWEALTH
REPORT**

The Commonwealth of Learning (COL) is an intergovernmental organisation created by Commonwealth Heads of Government to promote the development and sharing of open learning and distance education knowledge, resources and technologies.



Commonwealth of Learning, 2015

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List of Abbreviations

AVU	African Virtual University
BOCODOL	Botswana College of Distance and Open Learning
COL	Commonwealth of Learning
CSIR	Council for Scientific and Industrial Research
EFA	Education for All
ICT	Information and communication technology
ITU	International Telecommunication Union
KNUST	Kwame Nkrumah University of Science and Technology
MIT	Massachusetts Institute of Technology
MOOC	Massive open online course
NAMCOL	Namibia College of Open Learning
NDP	National development plan
NOLNET	Namibia Open Learning Network Trust
NOUN	National Open University of Nigeria
NREN	National research and education network
ODFL	Open, distance and flexible learning
ODL	Open and distance learning
OECD	Organisation for Economic Co-operation and Development
OER	Open educational resources
OLPC	One Laptop Per Child
PC	Personal computer
SAIDE	South African Institute for Distance Education
SANREN	South African National Research Network
TVET	Technical–vocational education and training
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
WEF	World Economic Forum

CHAPTER 1

AFRICA AND THE MEDITERRANEAN

Introduction

This chapter provides an overview of the adoption of technology-enabled learning (TEL) in the 18 Commonwealth countries in Africa (out of a total of 54 African countries) and two Commonwealth countries in the Mediterranean (out of a total of 25 Mediterranean countries),¹ as of May 2015. The study's terms of reference and a list of the 20 countries are provided in Appendix 1.

The African region had a population of 1.1 billion in 2013, which is set to double by 2050. Of these, an estimated 444 million people presently live in Africa's 18 Commonwealth countries. Africa is a continent on the rise, with a few of its economies showing a steady increase in economic growth in recent years, and the continent evincing a growing middle class and increased regional trade and investment. Poverty levels have fallen, from around 55 per cent in 2002 to 48 per cent in 2010. Child mortality rates have also decreased, with the average annual rate of decline in child deaths reaching 4.1 per cent for 2005–2012, up from 0.8 per cent in 1990–1995. More children are in school today than were a decade ago, including more girls, and the gender gap in school enrolment is narrowing (Africa Progress Panel, 2014).

However despite relative progress, the Organisation for Economic Co-operation and Development (OECD, 2015) confirms that: (i) human development levels in Africa remain much lower than the world average; (ii) high levels of inequality in Africa continue to significantly affect human development in the region; and (iii) substantial disparities in access to health and education are the underlying drivers of inequality, in contrast with countries experiencing high human development, where inequality is more closely related to income. The OECD also points out the continued prevalence of gender inequality, with the level of female human development being 13 per cent lower than that of males, and African women facing widespread discrimination that has an impact on their socio-economic rights and level. Furthermore, a study of 34 African countries found that Africans are increasingly dissatisfied with public provision of basic services, and "lived poverty at the grassroots remains little changed" despite Africa's recent surge in economic growth (OECD, 2015).

Compared to African Commonwealth countries, Cyprus and Malta are small, high-income nations that together had a total population of 1.3 million in 2014. Both countries also have higher levels of education. According to the United Nations Development Programme (UNDP), Cypriots in 2013 had 11.6 mean years of schooling compared to 9.9 years for Maltese in the same year (UNDP, 2014c, 2014h). However, economic growth in Cyprus has been declining since 2010, accompanied by increased unemployment levels, from 6.3 per cent in 2010 to 16 per cent in 2014. Malta has had more buoyant economic growth, and unemployment declined from 6.9 per cent in 2010 to 5.9 per cent in 2014 (Focus Economics, 2015a, 2015b).

Objectives of the Study

This baseline study serves to establish the conditions prior to the programmatic interventions of the Commonwealth of Learning (COL's) TEL Initiative that will take place in the two regions over the coming six years (2015 to 2021).

The study's terms of reference include the provision of baseline information for each of the 20 Commonwealth countries in the two regions on key aspects of TEL provision. These include identifying:

- national policies on information and communication technology (ICT) and open educational resources (OER);
- national priorities and initiatives;
- key institutions involved;
- institutions offering technology-enabled courses;

¹ For the purpose of this study, Cyprus and Malta form part of the "Mediterranean" region. This differs from the United Nations Statistics Division's classification of countries by major area and region of the world (2013), in which Cyprus is part of West Asia and Malta part of Southern Europe. The Commonwealth, however, classifies both as part of the European Region (Commonwealth Secretariat, 2015).

- institutions that have TEL policies;
- OER repositories;
- estimated numbers of teachers trained and to be trained; and
- estimated numbers of students studying ICT-related courses.

The study is primarily a desk review derived from Internet-based searches. Wherever possible, practitioners and policy makers from each country were consulted through informal discussions, either via email or face to face. The study provides an illustrative snapshot of the status of TEL, based on the above indicators. It cannot claim to be a comprehensive review of investments and progress in TEL at institutional, national and regional levels.

The study was limited by time and resource constraints. It was conducted over 30 days and, as mentioned, relied mainly on information gathered through Internet searches. These constraints limited data verification. However, where possible, these limitations were overcome through consultations with country representatives. One of the report's main areas of weakness is that whilst it provides an overview of the policy status of each country with respect to TEL, it offers less clarity on the extent to which policies and strategies, where they exist, have been implemented and evaluated. Nonetheless, where this information was available, we have referenced it accordingly in this report.

Each of the countries covered in the study have unique cultures, political economies and education systems that inform their investment in and experience with digital technologies in support of learning, teaching, skills development and education management. Various forms of states — ranging from constitutional monarchies (Lesotho) to constitutional democracies (Namibia) — have adopted concomitant policies and national economic frameworks that locate ICT within their country perspectives on economic and social progress.

CHAPTER 2

TECHNOLOGY-ENABLED LEARNING: REGIONAL TRENDS

All 20 countries covered in this study have rich experiences with exploring whether and how digital technologies can improve education access, quality and equity. Almost all have, in varying degrees, made significant financial, technological and human resource investments in this endeavour over the past two decades. The following reflect some of the dominant features that collectively characterise their TEL landscape today.

Policy Commitments in All 20 Countries

All 20 country governments have adopted national ICT policies that articulate, in various ways, their commitment to improving education and skills development through ICT. Of these, four had recently revised and updated their ICT policies: Kenya (2014), Malta (2014a, 2014b), Rwanda (2015) and South Africa (2014).

However only nine have dedicated ICT in education policies, and two of these are still in draft form: Ghana, Kenya, Malta, Namibia, Nigeria, Rwanda (draft), South Africa, Tanzania and Zambia (draft). Whilst Cameroon does not have a policy on ICT in education, it has a dedicated strategy for the implementation of ICT in education programmes.

In all 20 countries, their national ICT policies and ICT in education policies are expressions of aspirant national vision statements that associate higher levels of global competitiveness, economic progress and social advancement with investment in ICT. Each highlights the importance of growing beyond the dominant agricultural, commodity-based economies and becoming knowledge-based economies. Cultivating competitive local ICT and service sectors and the requisite skills for an emerging knowledge-based labour market are critical policy imperatives for all countries. The integration of ICT in the education and skills development sectors is located within this broader policy context.

Policies Focus More on ICT Access Targets

All 20 countries' ICT and ICT in education policies focus strongly on promoting access to ICT and reaching specified ICT access targets related to PCs, PC labs and Internet connectivity at education institutions. Few set targets on related infrastructure requirements, such as access to appropriate buildings and electricity. All refer to the importance of ensuring that teachers are trained in the use of ICT and able to access relevant digitised content. Here the focus is mainly on the promotion of "ICT literacy", the inclusion of computer science or ICT as a subject and, to some extent, using ICT to support curriculum coverage.

In general, the policies make very limited reference to: the nature of learning and thinking with technologies; how learning processes and learning cultures are changing; how quality learning and teaching are believed to be possible with technologies; and the kinds of learning outcomes that can be expected. More broadly, very limited expression is given to how education systems will be transformed through technology integration. Policies also place greater emphasis on the perceived benefits of technology investment for education as part of a broader optimistic discourse about the potential of ICT to leapfrog stages in economic development. Less reference is made to the potential risks and threats that they pose for education, economies and societies, and how these can be mitigated.

Gender Equality Provisions in ICT Policies

Ten of the 20 Commonwealth countries acknowledge the importance of addressing gender disparities in their ICT policies: Cameroon, Ghana, Kenya, Lesotho, Namibia, Rwanda, Seychelles, Sierra Leone, Swaziland and Uganda. References vary from a mere mention of gender issues to an explicit expression of commitment to gender equality and women's empowerment. However, whilst references to gender equality feature in the general education policies of some African Commonwealth governments, they are absent from specific ICT in education policies. Five of the nine countries that have ICT in education policies make reference to gender equality: Ghana, Kenya, Namibia, Rwanda and Zambia.

Out-of-date ICT in Education Policies

Seven of the eight countries that have specific ICT in Education policies adopted them on or before 2008. Nigeria's is the most recent (2010). Since 2010, however, there has been a sea-change in TEL and teaching, with the emergence of new forms of learning, new pedagogies, open content and big data, made possible by new, smarter and faster devices, connectivity and cloud computing. Existing ICT in education policies do not address these more recent developments, leaving a significant policy vacuum in many countries. Moreover, where policy reviews are underway, governments are acknowledging that policies have not been implemented optimally, targets have not been reached and mechanisms to monitor and evaluate progress or the lack thereof have not been in place. The latter is arguably also a function of suboptimal implementation plans and limited government capacity to lead and manage them.

Commitment to Open Access and OER

At a national level, few country governments have explicitly expressed policy commitments to the philosophy and practice of openness in access, technology standards, software, learning and education resources. The South African government has a policy on free and open source software and open standards, and its more recent *White Paper for Post-School Education and Training* expresses commitments to open learning and the use of OER (Department of Higher Education and Training, 2013). The Kenyan and Mauritian governments are currently discussing a draft national policy on OER, and the Nigerian and Ghanaian governments have policies on open government and open data.

African education institutions, particularly in higher education, have taken steps towards adopting open access policies, and some have established OER repositories. This baseline study identified six African education institutions that have adopted open access policies, although explicit policy commitments — on OER in particular — remain absent.

Another Wave of Pilots: Smart Classrooms, Tablet-based Learning and Cloud-based Schooling

A few African countries are exploring the establishment of “smart classrooms,” “paperless schools” and “cloud-based schooling” in a renewed focus on promoting 21st-century learning. Here, Kenya, Malawi, Rwanda and South Africa seem to be taking the lead.

In each of these countries, renewed pilot projects have been established, involving a few schools that are equipped with devices (usually tablets), smart boards, servers, Internet access and, sometimes, alternative energy solutions such as solar panels. The projects include boosting teacher training and access to digitised curriculum content. In most cases, however, the focus remains on classroom-based learning and less on one-to-one computing “solutions.” The projects serve to test the efficacy of “end-to-end solutions” in support of efficient education delivery and improved learner performance. These pilots are currently underway and serve to inform future roll-out plans.

In South Africa, one school, Sunward Park High, conducted “paperlessness” experiment. This involved greater investment in and use of technology for education delivery and increasingly less use of paper-based resources. Students and teachers received tablet devices that contained all the necessary education content and information, in place of textbooks. South Africa also produced a blueprint based on a three-year tablet integration and teacher development experiment with 14 rural schools in Cofimvaba, a district in one of South Africa's most educationally challenged provinces (Herselman & Botha, 2015).

Whilst budgets and plans have been made for larger-scale roll-out in a few cases, their successful implementation and outcomes have yet to emerge.

Teacher Centredness Still the Dominant Pedagogy

Whilst we found examples of African teachers applying innovative ways to teach and support learning with technologies, various studies showed that the dominant approach is still characterised by teacher uptake of ICT to reinforce traditional practice; teachers are not capitalising on the functionality of technologies to open up new pedagogical vistas based on learner-centredness and 21st-century learning (Isaacs, 2015; Muianga et al., 2013; Ndlovu & Lawrence, 2012). This trend is potentially due to the absence of teacher training and development programmes to support teachers, and/or limitations in the design of existing ICT integration and teacher development programmes.

CHAPTER 3

TECHNOLOGY-ENABLED LEARNING: COUNTRY REPORTS

Botswana

Introduction and Background

Since gaining independence in 1966, Botswana has been hailed as an economic and social success story (Commonwealth Secretariat, 2015; World Bank, 2015a). It has achieved near-universal primary education and adult literacy, at 88.5 per cent in 2013, having doubled in recent decades. Botswana has also experienced an increase in tertiary enrolments and has modified its technical–vocational education and training (TVET) sector. Botswana ranks 82nd out of 143 countries in terms of the quality of its education system (WEF, 2015a). However, the economy remains highly dependent on diamond mining, the nation is still challenged with integrating the remaining ten per cent of learners into the primary schooling system, and it still encounters high levels of graduate unemployment and a skills mismatch with their labour market, according to the World Bank (2015a). In 2012, the average life expectancy in Botswana was 64.4 years (UNDP, 2014a).

Table 1: Basic Data about Botswana

Indicators	
Population	2.02 million
Languages	Setswana (national language); English (official language)
Economic activity	Diamond mining
Human Development Index (2013)	0.683 (109 th out of 187 countries)
Gender Inequality Index (2013)	0.486 (100 th out of 149 countries)
Per capita gross national income (2013)	USD 16,400
Life expectancy (2013)	64.4
Mean years of schooling (2013)	8.8
Tertiary educated population	154,000

Sources: Commonwealth Secretariat (2015), UNDP (2014a), WEF (2015a)

Botswana’s investment in education is relatively high compared to most African countries, constituting 28 per cent of government expenditure (World Bank, 2015a). Table 1 shows that Botswana has a high level of gender inequality, based on the UNDPs Gender Inequality Index.

National Policies, Strategies and Programmes

Policies and laws in education are guided by the Constitution of the Republic of Botswana, which was enacted in 1966 and amended in 2002. The Constitution protects the fundamental freedoms and rights of Botswana’s citizens (Constitute Project, 2002).

National Vision and Economic Frameworks

The Botswana government adopted Vision 2016,² which envisages that Botswana will enter the information age on an equal footing with other nations, and that it will seek and acquire the best available information technology and become a regional leader in the production and dissemination of information. Vision 2016 includes a strategy for the development of education.

By 2016, Botswana aims to have a quality education system adaptable to the country’s and the world’s changing needs. The government is presently focusing on the need to improve educational access,

² http://www.vision2016.co.bw/tempimg/media/mediac_102.pdf

relevance and quality. It also proposes to empower its citizens to become excellent producers of goods and services (Isaacs, 2007a, p. 5).

The government adopted its tenth national development plan (NDP)³ for 2009 to 2016. The plan is founded on the principles of rapid economic growth, social justice, economic independence and sustainable development. It sets two goals related to education: to provide accessible, equitable, quality education; and to provide globally competitive human resources to drive economic growth. It also stipulates that ICT and innovation must serve as drivers for private-sector competitiveness and the export of goods and services. In addition, it states that Community Access Centres and School Net (Thuto Net) initiatives will continue during the tenth NDP (Government of Botswana, 2009).

National Laws and Policies Related to TEL

The Botswana government has historically been guided by its *Education Act* of 1967, which began undergoing a revision process in 2015 to accommodate changes brought about by the country's education reform process since the Act's inception (Kayawe, 2015).

The country adopted a revised national policy on education in 1994, which emphasises that Botswana's principal education goal is to produce a competent and productive workforce. It also highlights the need for all learners to be taught computer skills at all levels of school, and recommends the introduction of computer science as a subject option in senior secondary schools and computer awareness for the three years of junior secondary school. It also focuses heavily on tertiary education, with proposals to increase university enrolment.

The Government of Botswana recently adopted an Education and Training Sector Strategic Plan 2015–2020,⁴ which addresses a number of pillars, such as improving access, quality, inclusion, equity, accountability and governance in the education system. It identifies 11 key strategic priorities, supported by eleven programmes that together provide a comprehensive, integrated strategy for the sector. The plan emphasises aligning all education interventions with skills and labour force needs.

The government also adopted a national ICT policy (Maitlamo) in 2007,⁵ which lays out a plan for Botswana's social, cultural, economic and political transformation through ICT integration. Its main objectives are to make Botswana into a sub-Saharan ICT hub, foster the growth of the country's ICT industry, and provide universal service and access to ICT. The policy includes the following seven key programmes: Connecting Communities; Connecting Botswana; Government On-line; Thuto Net, which is the education programme; e-Health Botswana; ICT and Economic Diversification; and Connectivity Laws and Policies.

The World Economic Forum (2015a) ranked Botswana 26th out of 143 countries in terms of the effectiveness of its law-making bodies.

ICT Access and Use

The World Economic Forum (2015e) scores Botswana 3.4 on a scale of 1 to 7 in terms of Internet access in schools. The ITU (2014b) published the following ICT access data for 2013, reflecting high levels of mobile access.

³ http://www.nationalplanningcycles.org/sites/default/files/country_docs/Botswana/ndp_botswana.pdf

⁴ <http://www.gov.bw/Global/MoE/Acts/MOESD%20ETSSP-EDUCATION%20STRATEGY%20approved%20version%20II.pdf>

⁵ <http://unpan1.un.org/intradoc/groups/public/documents/unpan/unpan033694.pdf>

Table 2: ICT Access in Botswana

Fixed telephone subscriptions per 100 inhabitants	8.6
Mobile cellular telephone subscriptions per 100 inhabitants	160.6
Mobile broadband subscriptions per 100 inhabitants	74.1
Households with a computer	13.5%
Households with Internet access at home	10.6%
Individuals using the Internet	15%
Use of virtual networks	5.4%

Sources: ITU (2014b), World Economic Forum (2015e)

Based on their Network Readiness Index, the World Economic Forum (2015e) ranked Botswana 104th out of 143 countries in 2015, which represents a decline compared to 96th out of 144 countries in 2013. This decline has occurred despite Botswana's shift towards liberalising the ICT market and investing in bandwidth capacity via their connection to two undersea cables: the Eastern Africa Submarine Cable System (EASSy) and the West Africa Cable System (WACS) (Esselaar & Sebusang, 2013).

Major Initiatives

National Initiatives

The Botswana government has embarked on a few national initiatives to drive education improvement through ICT. These include:

Thuto Net

Botswana's NDP 9 identified Thuto Net as a national flagship that integrates ICT across the nation's education spectrum. The targets set in NDP 9 included:

- providing all schools with modern PCs and Internet access;
- increasing the ratio of PCs to learners to 1:7;
- designing and implementing an ICT content and curriculum development programme for the primary, secondary, vocational and tertiary sectors;
- designing and implementing professional development amongst teachers;
- developing ICT skills programmes for adult and non-formal learners;
- introducing a strong ICT proficiency measurement and skills monitoring programme;
- supporting e-education research and development; and
- securing funding to sustain ICT use in education.

Thuto Net is an expansive, overarching programme that includes the Schools Connectivity Initiative (or School Net) and the Computers for Schools programme. Both programmes have been involved in providing (i) all schools and libraries with computers and Internet connectivity, (ii) ICT training for teachers and (iii) ICT content for all levels, and for achieving the 1:7 PC-to-learner ratio. At the time of the NDP 9, Thuto Net also proposed Internet connectivity of 128 kbps and a central educational network as an extension of the Government Data Network, to support Botswana's Education Management Information System. By 2010, Thuto Net had made some progress, and NDP 10 proposes to continue the programme. In April 2014, the Botswana government launched the Thuto Net governance structure, which will co-ordinate the delivery of ICT within the education system ("Education sector," 2014).

Sesigo

Sesigo is a global development project that arose as a partnership between the Government of Botswana, represented by the Ministry of Youth, Sport and Culture through the Botswana National Library Service, and the Bill and Melinda Gates Foundation. The Botswana public library system consists of 24 branch libraries, four community libraries and 69 village reading rooms.

Sesigo's main purpose is to enable access to computers and the Internet for communities who are deprived of such access. It also serves to transform public libraries in Botswana so that they can expand their range of information services for communities in ways that can improve the inhabitants' lives.

Sesigo's target is to reach 78 public libraries with computers and Internet access. The project also includes a training programme for library staff on the use of computers, basic troubleshooting, as well as how the platform (computers) can be used to generate new services and make public libraries the e-government access platform. Library staff, in turn, train users of the library services. To date, more than 40,000 users have been trained (Sesigo, 2015).

Nteletsa II

The rural telecommunications development programme Nteletsa is one of the Government of Botswana's success stories. Begun in 1999, it aimed to provide communities with access to voice, data and Internet services. During the first phase, it connected villages in Barolong, Tswapong, Ngwaketse, Kweneng, and the southern and north-east regions of Botswana. In 2010, it commenced its second phase, which aimed to provide Internet services to 197 villages in the Chobe, Ghantsi, Kgalagadi, Central, Kgatleng, North West and Kweneng districts ("BTC rolls out second phase," 2010).

Institutional Initiatives

Botswana College of Distance and Open Learning (BOCODOL)

BOCODOL was formed in 1998 to provide access to learning opportunities for Botswana's out-of-school youths through the provision of open, distance and flexible programmes. Their students learn from specially designed study materials, which use a combination of different types of media, methods and communication technologies, rather than through the direct face-to-face mode of instruction used in conventional schools. Their range of course offerings includes vocational, professional management and other programmes. BOCODOL has also branched out as an open university, although it continues to provide open schooling programmes. They also have an established ICT strategy and policy in place.

BOCODOL is a hub for a tele-education programme that offers post-graduate, undergraduate, diploma and certificate programmes in partnership with universities from India over the Pan-African e-Network.

Furthermore, BOCODOL and the Botswana Ministry of Education and Skills Development have partnered with COL to produce OER for secondary school learners, to train teachers in the use of technology and OER, and to develop learner support materials for teachers (BOCODOL, 2015; Sultana, 2014). Based on their partnership with COL, BOCODOL has also developed an OER policy, which is currently in draft form (COL, 2015).

Prospects and Challenges

Botswana's commitment to improving education and skills development through the integration of digital technologies is clearly articulated in policy. The Botswana government has also established dedicated organisational structures to lead and guide policy implementation. In addition, they have allocated financial resources, developed partnerships with local and global institutions in support of their policy objectives and attracted private-sector investment in ICT. Liberalisation has also led to the expansion of the ICT sector, including to rural areas.

Botswana currently enjoys rapid growth in access to mobile technologies, including mobile broadband, which builds on their well-developed infrastructure. Botswana institutions like BOCODOL have also invested in the development of locally relevant OER in support of secondary schooling.

Whilst investment in TEL in Botswana seems to be significant, the country still has some way to go to achieve universal access in rural areas. Furthermore, information on and evidence of the impact of their investment in ICT on expanding education access, quality and equity is very limited, specifically to institutional experiences. Less information is available on the relationship between investments in new ways of learning and teaching with digital technologies and improved outcomes at the national system level. The lack of attention to matters relating to gender equality and women's empowerment within the ICT in education space continues to be an important weakness in the Botswana government's policy and strategy.

Cameroon

Introduction and Background

Of the 21.7 million people in Cameroon, 53 per cent live in urban areas. The country falls into the low human development category, according to the UNDP (2014b), which ranks Cameroon 150th out of 187 countries in terms of their Human Development Index. Cameroon ranks 62nd out of 143 countries in the quality of its education system (WEF, 2015b). In 2013, it had a secondary education attainment rate of 51.8 per cent and a tertiary attainment rate of 7.9 per cent for its 25 to 54 age group (WEF, 2015b). Cameroon has a high level of gender inequality, based on the UNDP's Gender Inequality Index (UNDP, 2014b).

Table 3: Basic Data about Cameroon

Indicators	
Population (2012)	21.7 million
Languages	French, English
Economic activity	Crude oil is a large foreign currency earner
Human Development Index (2013)	0.504 (152 nd out of 187 countries)
Gender Inequality Index (2013)	0.622 (136 th out of 149 countries)
Per capita gross national income (2013)	USD 2,557
Life expectancy (2013)	55.1
Mean years of schooling (2013)	5.9
Tertiary educated population	751,000

Sources: Commonwealth Secretariat (2015), UNDP (2014b), WEF (2015b)

National Policies, Strategies and Programmes

Policies and laws in education are guided by the Constitution of the Republic of Cameroon, which was enacted in 1996.

National Vision and Economic Frameworks

The Cameroon government adopted Vision 2035,⁶ which envisages Cameroon as an emerging economy by 2035. The objectives of the Vision are to: eradicate poverty by improving social services, including health and education; become a middle-income country so that the average income can increase; and become an industrialised country and an emerging economy.

National Laws and Policies Related to TEL

In 2007, Cameroon adopted a National ICT Policy.⁷ This policy is intended to implement certain provisions of the Constitution, along with the Investment Code, education-sector laws and the major guidelines of the nation's poverty-reduction strategy, and to honour commitments made by Cameroon regarding global poverty-reduction efforts.

The education-related policy objectives are to enhance quality and increase access to education, training and research through the use of ICT. The strategies to reach this objective include:

- providing training for teachers and health professionals in ICT usage;
- promoting new and innovative forms of teaching and learning (e.g., eLearning, telemedicine)
- promoting high-capacity, reliable and cheap connection for all schools, universities and research institutions;

⁶ http://www.cameroonembassyusa.org/docs/webdocs/Cameroon_VISION_2035_English_Version.pdf

⁷ http://www.ist-africa.org/home/files/Cameroon_NationalICTPolicy_2008.pdf

- providing support to ICT research and development as well as monitoring scientific and technological evolution; and
- promoting the training of women, persons with disabilities and vulnerable groups in aptitudes, skills and competencies that will be valuable for the economy in a knowledge-based society (Government of Cameroon, 2008).

The Ministry of Education recently developed a Strategy for the Implementation of the National ICT Policy in Basic Education, 2007–2015.⁸ The strategy contains five pillars, each containing guiding principles and targets:

- Infrastructure and Readiness;
- Training;
- Utilising ICT in the Curriculum;
- Sustainability, Maintenance and Support; and
- Evaluating ICT Initiatives.

The strategy includes training in ICT for teachers and school directors and the integration of ICT into the curriculum. It also contains draft national guidelines for teaching ICT in pre-school and primary schools, with six different modules adapted to each level, from discovery and presentation skills, to applying skills, to knowledge construction, to learning health and safety issues related to the use of ICT.

The teacher modules include productivity and research, applying ICT to teaching and learning, evaluation, and social, moral and human questions related to ethics and equality (Cameroon Education Development Board, 2015).

ICT Access and Use

The World Economic Forum (2015e) scores Cameroon 2.7 on a scale of 1 to 7 in terms of Internet access to schools. In general, data on ICT access in education in Cameroon are not readily available. However, the ITU (2014) published the following ICT access data for 2013, revealing very low levels.

Table 4: ICT Access in Cameroon

Fixed telephone subscriptions per 100 inhabitants	3.6
Mobile cellular subscriptions per 100 inhabitants	70.4
Households with a computer	8.9%
Households with Internet access at home	4.5%
Individuals using the Internet	6.4%

Source: ITU (2014)

Based on their Network Readiness Index, the World Economic Forum (2015e) ranks Cameroon 126th out of 143 countries in 2015, a decline from 124th out of 144 countries in 2013.

Major Initiatives

National Initiatives

Digital Schools Project

In 2015, the Ministry of Secondary Education launched a Digital Schools Project in partnership with the MTN Cameroon Foundation; the project aims to provide students with computer and Internet access through the installation of computer equipment and multimedia centres in secondary schools across Cameroon. It plans to install 15 multimedia centres across Cameroon’s 10 regions within a year (“MTN Cameroon,” 2015).

⁸ <http://www.cedboard.org/strategy-for-the-implementation/>

One Laptop Per Child (OLPC) Cameroon

The OLPC project commenced in Cameroon in 2013, based on a partnership between OLPC, the Ministry of Education and the Islamic Development Bank that was established in 2012. The Islamic Development Bank provided the funding for the initial distribution of 5,000 XO laptops to primary school children in Cameroon. The project initially covered 51 schools in six regions and planned to deploy across the country ("Islamic Development Bank," 2012).

Institutional Initiatives

University of Yaounde I

The University of Yaounde and the United Nations University formed a partnership in 2012 to collaborate on an eLearning initiative that supports increasing student enrolments as part of attempts to counteract scarce teaching and learning resources at the university. The university also formed a partnership with three other universities, in Kenya, South Africa and Germany, to facilitate capacity building and collaborative support over a two-year period, which ended in 2014. Based on these experiences and partnerships, the University of Yaounde has an eLearning portal up and running and available for students and teachers (Ehlers, 2013).

Prospects and Challenges

The Government of Cameroon has made clear policy commitments to promote TEL in its education systems. It has also developed strategies and action plans to put these policies into effect. However, it appears that to date, implementation has been limited. Many Cameroonian education institutions seem to remain constrained by a lack of access to ICT infrastructure, unreliable power sources and limited human resource expertise in the integration of digital technologies in learning and teaching. A study by Lumadi (2014) that was based on a survey of 796 student-teachers drawn from eight primary government teacher training colleges and three higher teacher training colleges in Cameroon revealed that the challenges to the effective adoption of eLearning included: slow Internet access speed; inadequate ICT infrastructure; insufficient knowledge about eLearning; recurrent power failures; and the lack of ICT-based curriculum development programmes.

Cyprus

Introduction and Background

Cyprus is a small, high-income country with a population of 1.1 million people, of whom 71 per cent live in urban areas. In 2012, it had an adult literacy rate of 99 per cent, enjoyed a 99 per cent primary enrolment rate and had a life expectancy of 79.8 years (Commonwealth Secretariat, 2015; World Bank, 2014), and in 2013, it had a secondary education attainment rate of 95.5 per cent for its 25 to 54 age group (WEF, 2015c). The World Economic Forum (2015c) ranks Cyprus 13th out of 143 countries in terms of the quality of its education system.

Table 5: Basic Data about Cyprus

Indicators	
Population (2012)	1.1 million
Languages	Greek Turkish
Dominant economic activities	Tourism, financial services and offshore natural gas
Human Development Index (2013)	0.845 (32 nd out of 187 countries)
Gender Inequality Index (2013)	0.136 (23 rd out of 149 countries)
Per capita gross national income (2013)	USD 26,771
Life expectancy (2013)	79.8
Mean years of schooling (2013)	11.6
Tertiary educated population	218,000

Sources: Commonwealth Secretariat (2015), UNDP (2014c), WEF (2015c)

Table 5 shows that Cyprus has a low level of gender inequality in terms of the UNDP's Gender Inequality Index.

National Policies, Strategies and Programmes

Policies and laws in education are guided by the Constitution of the Republic of Cyprus, which was enacted in 1960 and has been amended five times. The latest amendments were adopted in 2006.

National Economic Frameworks

The Government of Cyprus adopted a Sustainable Development and Competiveness Programme for 2010 to 2013, which confronted many challenges. It revised this plan and developed a Europe 2020 Strategy for Smart, Sustainable and Inclusive Growth.⁹ This programme highlights the importance of improving education standards in Cyprus and asserts that ICT can contribute significantly to this as part of a national strategy that also includes the growth of the ICT sector and, with it, a competitive economy.

National Policies and Strategies Related to TEL

In 2012, the Government of Cyprus adopted a 2012 Digital Strategy for Cyprus,¹⁰ one objective of which is to promote digital education by using ICT as a dynamic tool to upgrade, enrich and reform the educational process. The strategy identifies a number of actions to reach this objective. They include:

- Networking all public schools with the datacentre, using high-speed physical connections and logical connections.
- Completing the structure cabling in all schools.
- Increasing the number of PCs in each school to achieve one PC per student.
- Installing computers and multimedia labs in every school.

⁹ http://ec.europa.eu/europe2020/pdf/nd/nrp2013_cyprus_en.pdf

¹⁰ [http://www.mcw.gov.cy/mcw/dec/digital_cyprus/ict.nsf/3700071379D1C658C2257A6F00376A80/\\$file/Digital%20Strategy%20for%20Cyprus-Executive%20summary.pdf](http://www.mcw.gov.cy/mcw/dec/digital_cyprus/ict.nsf/3700071379D1C658C2257A6F00376A80/$file/Digital%20Strategy%20for%20Cyprus-Executive%20summary.pdf)

- Installing interactive whiteboards in every school.
- Expanding the implementation of a learning management system (DIAS) in all secondary and technical schools. This platform was launched on a pilot basis in seven schools in April 2009.
- Developing digital educational content for the majority of primary and secondary schools.
- Creating distance learning applications.
- Computerising the educational system. The new system will be interfaced with DIAS.
- Additional training for teachers to further integrate ICT in the learning process.
- Developing an interactive learning centre.
- Evaluating students' e-skills and implementing measures to improve them.
- Upgrading the infrastructure of public tertiary education. Three projects have been approved regarding the three state universities: the University of Cyprus, the Cyprus University of Technology and the Open University of Cyprus. The projects aim to upgrade and develop the technological infrastructure that will provide the tools for integrated, automated and quality services for students, academics and administrative personnel (Government of Cyprus, 2012, pp. 8–9).

Cyprus does not have a dedicated ICT in education policy, nor does its existing digital strategy make reference to gender equality or women's empowerment.

According to European SchoolNet and the University of Liege (2012, p. 5) all textbooks, materials and teaching aids are provided to schools and pupils free of charge. Public schools are not at liberty to decide on the content of the curriculum, the textbooks used, the appointment of teaching staff or raising and managing money for the school.

ICT Access and Use

Cyprus has more computers available to students in all grades, except Grade 4, than the European Union average. However, Cyprus features amongst the lowest ratios of students to Internet-connected desktops in Europe for most grades. Approximately half of teachers use ICT in 25 per cent or more of their lessons in Cypriot schools (European SchoolNet & University of Liege, 2012).

The ITU (2014) published the following ICT access data for 2013, reflecting an increase in mobile subscriptions, household computer owners and individual use of the Internet. Cyprus shows fairly high levels of ICT access compared to Commonwealth African countries.

Table 6: ICT Access in Cyprus

Fixed telephone subscriptions per 100 inhabitants	30.6
Mobile cellular telephone subscriptions per 100 inhabitants	95.2
Households with a computer	70.3%
Individuals using the Internet	65.5%
Internet access in schools	5.6

Sources: ITU (2014), World Economic Forum (2015e)

Based on their Network Readiness Index, the World Economic Forum (2015e) ranks Cyprus 36th out of 143 countries in 2015, compared with 35th out of 144 countries in 2013. They also score Cyprus at 5.6 on a scale of 1 to 7 in terms of Internet access for schools.

Major Priorities and Initiatives

National Initiatives

ICT for Inclusion

The Government of Cyprus established the agency ICT for Inclusion, which served to promote access to assistive technologies for people with disabilities. This project ran from 2012 to 2013 and was implemented in 150 schools with learners who had special needs.

Web-Based Education in Secondary Schools

The Ministry of Education and Culture also embarked upon a web-based education project for secondary schools which involved promoting access to the Internet, as well as the training and professional development of teachers in web-based learning, teaching and assessment. This project is currently underway.

Institutional Initiatives

European University Cyprus

This university has a number of ICT in education projects and programmes as well as institutional structures that support innovative work at the university. One of these is the Research Laboratory in ICT-Enhanced Education, which has designed and implemented a range of research initiatives related to the innovative use of ICT in support of learning and teaching.

Prospects and Challenges

Compared to many African Commonwealth countries, Cyprus has several distinct advantages. One of these is that a high number of its university-educated citizens have ICT skills. Cyprus also has many partners and networks in the European Union, which also supports the mushrooming of innovative projects in various institutions across the country. Furthermore, Cyprus has strong, government-driven policy and implementation strategies in place.

Despite high levels of investment in TEL and technology-enabled teaching, it appears that much of the focus of interventions thus far has been on expanding access to technologies, including digitised curriculum content, and on training teachers to use digital technologies as part of their classroom practice. Less attention has been paid to shifts in education at a national systemic level and the extent to which the country's strategic education and skills development goals are being met, based on its investment in digital technologies.

Ghana

Introduction and Background

Ghana is situated on the west coast of Africa and had a population of 25.4 million in 2012. The World Economic Forum (2015d) ranks Ghana 59th out of 143 countries in terms of the quality of its education system. In 2013, it had an adult literacy rate of 76.6 per cent, a secondary education attainment rate of 66.4 per cent and a tertiary education attainment rate of 7.7 per cent for its 25 to 54 age group (WEF, 2015d). Ghana has a high level of gender inequality, based on the UNDP's Gender Inequality Index.

Ghana is the second largest cocoa producer in Africa, the second largest gold producer in Africa and one of Africa's newer oil-producing countries.

Table 7: Basic Data about Ghana

Indicator	
Population (2013)	26.98 million
Languages	English
Economic activity	Cocoa farming, gold and diamond mining, offshore oil production
Human Development Index (2013)	0.573 (138 th out of 187 countries and territories)
Gender Inequality Index (2013)	0.549 (122 nd out of 149 countries)
Per capita gross national income (2013)	USD 3,532
Life expectancy (2013)	61.1
Mean years of schooling (2013)	7
Tertiary educated population	1,052,000

Sources: Commonwealth Secretariat (2015), UNDP (2014d), World Economic Forum (2015d)

National Policies, Strategies and Programmes

As in most African countries, the Constitution of the Republic of Ghana, adopted in 1992, is the supreme law under which Ghana's education laws and policies fall. The Constitution states that all persons have the right to equal educational opportunities and facilities; that basic education shall be free, compulsory and available to all; that secondary education in its different forms, including technical and vocational education, should be available and accessible to all; and that higher education should be made equally accessible to all.

National Economic Frameworks

The Ghanaian government adopted Vision 2020¹¹ in 1995, which provided a national framework for Ghana's economic and social development in the decades to follow. In this document, the government envisages Ghana becoming a middle-income economy by 2020. The NDPs that have been developed every five years since 1995 focus specifically on achieving the ideals set out in the Constitution, to: achieve universal basic education and eradicate adult illiteracy; increase female enrolment and completion rates in school; reduce drop-out rates; improve the quality of education; and expand access to secondary and tertiary education.

National Policies and Strategies Related to TEL

In 2003, Ghana adopted an ICT for Accelerated Development Policy,¹² which provides a framework and plan for the adoption of ICT to achieve the national goal of "transforming Ghana into an information and knowledge-driven, ICT-literate nation." This policy outlines 14 strategic pillars of intervention, including education.

¹¹ <http://www.ndpc.gov.gh/GPRS/Ghana's%20Vision%202020%20-%20First%20Step.pdf>

¹² <http://unpan1.un.org/intradoc/groups/public/documents/un/unpan032381.pdf>

The Ministry of Education subsequently adopted a National ICT in Education Policy¹³ in 2008. The policy is underpinned by four key pillars related to the promotion of equity, capacity building, access to ICT infrastructure, and norms and standards, and it focuses on seven key thematic areas:

1. Education Management by Ministry / Agencies and Educational Institutions
2. Capacity Building
3. Infrastructure, E-readiness and Equitable Access
4. Incorporating ICTs into the Curriculum
5. Content Development
6. Technical Support, Maintenance and Sustainability
7. Monitoring and Evaluation

Each of these areas contains guiding principles, clearly defined objectives and strategies to meet the stated objectives (Government of Ghana, 2008).

ICT Access and Use

The World Economic Forum (2015e) scores Ghana at 3.2 on a scale of 1 to 7 in terms of Internet access to schools in 2013. Data on ICT access in education in Ghana are not readily available. However, the ITU (2014) published the following ICT access data for 2013, reflecting relatively low levels of access, although a high mobile subscription rate.

Table 8: ICT Access in Ghana

Fixed telephone subscriptions per 100 inhabitants	1.0
Mobile cellular telephone subscriptions per 100 inhabitants	108.2
Mobile broadband subscriptions per 100 inhabitants	39.9
Households with a computer	36.6%
Households with Internet access at home	31.8%
Individuals using the Internet	12.3%

Source: ITU (2014)

Based on their Network Readiness Index, the World Economic Forum (2015e) ranks Ghana 101st out of 143 countries in 2015, compared with 95th out of 144 countries in 2013.

Major Priorities and Initiatives

National Initiatives

The government has embarked on a few national initiatives to drive education improvement through ICT, a key one being its open data initiative.

Ghana Open Data Initiative (GODI)

GODI is an initiative of the Ministry of Communications that is being spearheaded by their National Information Technology Agency,¹⁴ the government's IT implementation agency. The portal is intended to be used by Government of Ghana ministries / departments and their organisations to publish datasets, documents, services, tools and applications collected by them for public use. The objective of the initiative is to promote openness and transparency in government transactions.

¹³ http://www.moe.gov.gh/assets/media/docs/ICTinEducationpolicy_NOV2008.pdf

¹⁴ <http://www.nita.gov.gh>

GODI includes a dedicated focus on education communities. It makes available educational data, tools and information related to the status of education in Ghana. For example, it provides a report on Ghana's TVET Schools Census, conducted in 2010–2011 and 2011–2012.

Institutional Initiatives

Ghana-India Kofi Annan Centre of Excellence in ICT

The Centre of Excellence was established in 2003 and has been host to Ghana's first Advanced IT Institute. It was set up to stimulate and support the growth of the ICT sector in West Africa by offering a range of ICT-related skills training programmes and courses for decision makers and various social groups. The Centre offers a number of courses on networking, programming, web development and software training, some of which can be taken online.

Kwame Nkrumah University of Science and Technology (KNUST)

KNUST hosts an African OER Health Network,¹⁵ which focuses on growing a network of organisations and partners that can develop, adapt and share health education resources for resource-limited institutions in the health education sector. This is believed to have a positive impact on health provision in Africa.

KNUST also adopted an OER policy in 2010,¹⁶ in which the university envisages becoming a leading developer of OER; it will use its own OER and those of others, which they commit to integrating fully in teaching and learning at all levels in their institution so that they can achieve the highest standard of education. The policy serves to: guide the development and review of OER materials prior to sharing them on a worldwide scale; clarify publication rights and licensing issues; outline policies regarding the use of required infrastructure; identify resources to support faculty in developing OER for teaching and learning; and define KNUST's open access collaboration efforts (KNUST, 2010). KNUST also has an OER repository,¹⁷ which contains courses and resources produced by KNUST and its partners.

Council for Scientific and Industrial Research (CSIR), Ghana

The CSIR-Ghana is currently developing an open access policy in partnership with Electronic Information for Libraries. This makes the CSIR one of the few African institutions, to date, that are developing such a policy (Electronic Information for Libraries, 2015).

Prospects and Challenges

In recent years, Ghana has made progress on ICT in education. The adoption of an ICT in Education Policy in 2008 provided an enabling environment and stated the government's commitment to promote access to ICT in order to support learning, teaching and improved education management. Ghana has also taken the lead in promoting open and transparent governance through its open data initiative and open government partnership programme.

However, Ghana still faces uneven access to ICT infrastructure. Recent reports on progress with ICT use in schools suggest that there is little focus on using ICT optimally to support teaching and learning.

Furthermore, Ghana's policies are currently out of date and do not take into account many changes that have occurred in technology-enhanced learning spaces.

¹⁵ <http://www.oerafrica.org/healthoer>

¹⁶ <http://archive.knust.edu.gh/downloads/20/20411.pdf>

¹⁷ <http://web.knust.edu.gh/oer/pages>

Kenya

Introduction and Background

Kenya is a constitutional democracy situated in East Africa. In 2013, it had a population of 44.4 million, of whom 24 per cent live in urban areas (Commonwealth Secretariat, 2015). Kenya is categorised as a low human development country. It also had a high level of gender inequality as of 2013, based on the UNDP's Gender Inequality Index (UNDP, 2014e). In 2012, Kenya had a primary school enrolment rate of 114 per cent (World Bank, 2015b).

Table 9: Basic Data about Kenya

Indicator	
Population (2013)	44.4 million
Languages	Kiswahili, English
Economic activity	Agriculture (tea, coffee, horticulture); tourism
Human Development Index (2013)	0.535 (147 th out of 187 countries and territories)
Gender Inequality Index (2013)	0.548 (121 st out of 149 countries)
Per capita gross national income (2013)	USD 2,158
Life expectancy (2013)	61.7
Mean years of schooling (2013)	6.3

Sources: Commonwealth Secretariat (2015), UNDP (2014e)

National Policies, Strategies and Programmes

The Government of Kenya adopted its Constitution in 1969 and updated it in 2010. The Constitution is the supreme law of the country and governs all laws and policies related to education. It stipulates that everyone has the right to education (Government of Kenya, 2010).

National Economic Frameworks

In 2007, the Kenyan government adopted the Kenya Vision 2030¹⁸ development strategy, which aims to accelerate sustainable growth, reduce inequality and manage resource scarcity. In that document, education is identified as a key pillar of the country's growth and development. The government commits to providing globally competitive education, training and research, and to becoming a regional centre of research and development in new technologies. This will be achieved through: integrating early childhood education into primary education; reforming secondary school curricula; modernising teacher training; strengthening partnerships with the private sector; developing key programmes for learners with special needs; rejuvenating ongoing adult training programmes; revising the curriculum for university and technical institutes to include more science and technology; and working in partnership with the private sector (Government of Kenya, 2007).

National Policies and Strategies Related to TEL

In 2015, the Government of Kenya adopted the Kenya National ICT Master Plan 2014 to 2017¹⁹ (Government of Kenya, 2014). This plan identifies ICT and human capital development as critical pillars in the growth and sustainability of Kenya's ICT sector. Furthermore, one of its five top flagship projects includes the establishment of five Education and Training Centres of Excellence to address the country's shortage of higher level technical professionals.

The government also developed a National ICT Strategy for Education and Training²⁰ in 2006. The strategy outlines the key areas of (i) intervention to promote access to ICT in all of Kenya's education

¹⁸ http://www.researchictafrica.net/countries/kenya/Kenya_Vision_2030_-_2007.pdf

¹⁹ <http://www.icta.go.ke/national-ict-masterplan>

²⁰ <http://nepadkenya.org/documents/MOE-ICT%20in%20Education.pdf>

institutions, (ii) teacher training and development, (iii) the development of digital content and (iv) the establishment of education management and information systems. It also provides a framework for the strategy's implementation.

ICT Access and Use

The World Economic Forum (2015e) scores Kenya at 4.1 on a scale of 1 to 7 in terms of Internet access to schools in 2013. Data on ICT access in education in Kenya are not readily available. However, the ITU (2014) published the following ICT access data for 2013, reflecting very low levels of access in general but a high mobile subscription rate.

Table 10: ICT Access in Kenya

Fixed telephone subscriptions per 100 inhabitants	0.5
Mobile cellular telephone subscriptions per 100 inhabitants	70.6
Mobile broadband subscriptions per 100 inhabitants	3
Households with a computer	10.8%
Households with Internet access at home	14.2%
Individuals using the Internet	39%

Source: ITU (2014)

Based on their Network Readiness Index, the World Economic Forum (2015e) ranks Kenya 86th out of 143 countries in 2015, compared with 92nd out of 144 countries in 2013.

Major Priorities and Initiatives

National Initiatives

The Kenyan government has embarked on a few national initiatives to drive education improvement through ICT, including the following three.

Towards a National OER Policy in Kenya

The Kenyan government is a signatory to UNESCO's 2012 Paris Declaration on Open Educational Resources licensed under Creative Commons open licences. Consistent with the declaration's principles, the government also started a process of developing a national OER policy. In February 2014, it partnered with UNESCO to host a dedicated workshop for its officials to discuss and plan the development of an OER policy. The workshop concluded with a draft OER policy that covered key issues, including: intellectual property rights and licensing; leadership and management; skills for policy advisors; quality assurance policy guidelines; professional development; curriculum assessment; ICT infrastructure; and marginalised and vulnerable groups (UNESCO, 2015).

Kenya Open Data Initiative (KODI)

The KODI focuses on developing an ecosystem that promotes openness and transparency in the provision of access to information by the Kenyan government to the public. The KODI gives Kenyan citizens access to reports, as well as updates on the status of the Kenyan economy, social sectors and society at large, through the open publication of reports and documents that it makes available on the KODI website.

Ministry of Education, Science and Technology (MoEST) Tablets for Learners

The Kenyan MoEST²¹ has also commenced a few pilot projects to explore the prospects of improved learning and teaching with tablet PCs. It partnered with private companies — Qualcomm Bboxx Kenya, eLimu, iHub Research, Safaricom and Motorola — to pilot the use of 3G-enabled tablets at the Embakasi Garrison Primary School. The purpose of the pilot is to measure improvement in the learners' academic performance through their use of the tablets. Based on this experience, the project will roll out on a larger scale. The tablets also rely on solar charging in an attempt to address Kenya's energy challenges.

²¹ <http://www.education.go.ke/Home.aspx?department=1>

Institutional Initiatives

Africa Nazarene University (ANU)

The Africa Nazarene University is a private Christian university based in Kenya, sponsored by the Church of the Nazarene International, and had 4,000 students in 2012. ANU is one of the few African universities to have a dedicated policy on OER integration²² in open and distance eLearning and campus-based provision (ANU, 2015).

The policy document states that their mathematics education for teachers at ANU has benefited the most from a number of software applications that have been downloaded freely for use in the training of teachers. The student teachers have found these resources helpful in writing mathematics documents and for learning basic mathematics and calculus.

The purpose of their policy is to guide both the development and the review of OER materials before sharing them on a worldwide scale. They have also adopted the Creative Commons licensing scheme as a basis for sharing and licensing materials (ANU, 2014).

OER Africa

The OER Africa project was established by SAIDE in Nairobi, Kenya, to drive the development and use of OER in higher education institutions across Africa. Over the past three years, OER Africa's work has focused on: supporting the development of institutional policies on OER; developing collaborative networks amongst academics and institutions in support of OER creation, use and sharing; and growing the OER Africa repository²³ of resources.

African Virtual University

Kenya is also home to the African Virtual University (AVU), another of the continent's leading eLearning institutions. The AVU offers a wide range of online courses and hosts an OER repository.²⁴ The organisation's vision is to become the leading pan-African eLearning network. It offers a wide range of programmes and courses to expand access to tertiary and continuing education to Africans across the continent.

School of Open Africa

In October 2014, the Ministries of ICT and Education in Kenya partnered with UNESCO in launching the School of Open Africa. The school runs nine programmes that operate in four countries: Kenya, Nigeria, South Africa and Tanzania. The programmes include various short courses and skills training workshops for young learners in primary school on how to code, design animations and create and use OER (School of Open Africa, 2015).

Kenya Library and Information Services Consortium

The issue of open access has also been at the forefront for institutions like the Kenya Library and Information Services Consortium.²⁵ Recently they hosted an open access publishing workshop with the University of Nairobi as part of a joint project on knowledge sharing and sustainable scholarly communication, which involves institutions in Kenya, Tanzania and Uganda.

Prospects and Challenges

Kenya has been a hub of innovation in recent years regarding the use of ICT for social and economic development in general. This has been aided by the rapid growth of the M-Pesa initiative, which enables access to banking and payment options for communities that were historically too poor to be considered "bankable."

Kenya has a few established Innovation Hubs where young, budding ICT entrepreneurs create new digital products that can service the needs of the Kenyan population.

²² https://wiki.creativecommons.org/images/9/94/ANU_Policy_on_OER_integration_into_ODeL_approved_Version.pdf

²³ <http://www.oerafrica.org/findoer>

²⁴ <http://oer.avu.org>

²⁵ <http://www.kenyalibraryassociation.or.ke>

The government is strongly committed to playing a leading role in Africa in the creation of locally relevant ICT that can support socio-economic development. Its adoption of the ICT Masterplan and ICT in Education Strategy, as well as its existing pilots and programmes in education institutions across Kenya, bode well for reaching its stated objectives. Its impending adoption of a national OER policy, the establishment of KODI, and being home to OER Africa and the AVU collectively place Kenya as a front runner in the open government movement in Africa.

However, Kenya remains constrained by unreliable Internet access and insufficient human resource capacity in both the public and the private sectors. In addition, their ICT in Education Strategy is currently at odds with some of the budding pilots and projects because the strategy is out of date.

Lesotho

Introduction and Background

Lesotho is a constitutional monarchy that presides over a small, landlocked country with a small population and an economy that is based mainly on subsistence agriculture. It has a population of 2.1 million people (WEF, 2015f). The country falls into the low human development category according to the UNDP (2014f) and ranks 49th out of 143 countries in the quality of its education system (WEF, 2015f). In 2013, it had a secondary education attainment rate of 18.6 per cent and a tertiary attainment rate of 1.4 per cent for its 25 to 54 age group (WEF, 2015f). Lesotho has a high level of gender inequality, based on the UNDP's Gender Inequality Index (UNDP, 2014f).

Table 11: Basic Data about Lesotho

Indicators	
Population (2013)	2.1 million
Languages	Sesotho, English
Economic activity	Manufacturing (clothing, textiles, milling, canning); tourism
Human Development Index (2013)	0.486 (162 nd out of 187 countries and territories)
Gender Inequality Index (2013)	0.557 (125 th out of 149 countries)
Per capita gross national income (2013)	USD 2,798
Life expectancy (2013)	49.4
Mean years of schooling (2013)	5.9
Tertiary educated population	8,000

Sources: Commonwealth Secretariat (2015), UNDP (2014f), WEF (2015f)

Policies, Strategies and Programmes

Policies and laws in education are guided by the Constitution of Lesotho, which was adopted in 1993. The Constitution stipulates that primary education should be compulsory and available to all, that those who have not completed primary education should be encouraged to do so, and that education should be directed towards the full development of the human personality and sense of dignity and the strengthening of respect for human rights and fundamental freedoms (Government of Lesotho, 1993).

National Vision and Economic Frameworks

Under the guidance of the Constitution, the Government of Lesotho developed its National Vision 2020,²⁶ which aspires to create a Lesotho that has a stable democracy, a healthy and well-developed human resource base, a strong economy, a well-managed environment and established technology.

To reach the goals of its National Vision, the government developed a National Strategic Development Plan²⁷ for 2012–2016 as a medium-term implementation strategy. Its objectives include:

- high shared and employment-creating economic growth;
- the development of infrastructure (a minimum infrastructure platform);
- the transformation of skills development institutions and improvement of the nation's skills and innovation base;
- reversal of environmental degradation; and
- improved health, including combating HIV and AIDS and reducing social vulnerability.

Alongside its National Vision, the government also adopted a Poverty Reduction Strategy and National Strategic Development Plan 2012/2013 – 2016/2017, in which it commits to building the country's ICT infrastructure, promoting access to and use of ICT, promoting ICT literacy and developing niche ICT sub-sectors. With reference to education, the plan commits to:

²⁶ http://www.gov.ls/documents/National_Vision_Document_Final.pdf

²⁷ <http://www.imf.org/external/pubs/ft/scr/2012/cr12102.pdf>

- developing an ICT roll-out strategy and plan for schools and informal education programmes, and facilitating their implementation;
- creating community education and information programmes;
- improving the coverage and quality of postal services by integrating ICT services; and
- promoting integrated private service provisions (e.g., Internet shops), especially in remote areas (Government of Lesotho, 2012, p. 148).

National Policies and Strategies Related to TEL

The government passed the Education Act of 2010,²⁸ which sets the legal parameters within which education institutions can operate in Lesotho.

It also adopted an Education Sector Strategic Plan 2005–2015,²⁹ which stipulates that it will allocate resources for implementing ICT programmes in schools and health institutions, promoting IT applications, using IT to ensure Lesotho becomes an information-rich society and deploying ICT to transform education management in schools (Government of Lesotho, 2005a, pp. 24–25).

Whilst Lesotho does not have an explicit national policy on ICTs in education, the government adopted a National ICT Policy in 2005,³⁰ which refers to education. The policy's vision is to create a knowledge-based society fully integrated into the global economy by 2020. It proposes the following strategies:

- Making ICT literacy and training programmes available throughout the education system and amongst the broader public.
- Growing the resource pool of ICT professionals with standardised skill sets and ensuring that appropriate incentives are in place to retain these workers.
- Encouraging lifelong learning amongst the population at large and promoting on-the job training and retraining within the public and private sectors.
- Promoting electronic distance learning to maximise scarce resources and expand access to educational training and research (Government of Lesotho, 2005a).

The policy further states the government's commitment to:

- developing partnerships with stakeholders to facilitate the acquisition of ICTs for all education institutions;
- facilitating the provision of distance learning applications through ICTs to ensure academic and training programmes are available nationally;
- encouraging the National Library to be equipped with appropriate ICT tools and resources;
- integrating ICTs in mainstream educational curricula as well as other literacy programmes and providing equitable access for students at all levels;
- developing special ICT training programmes for disabled persons, youth and women;
- setting up mechanisms that promote collaboration between industry and training institutions to build appropriate human resources capacity;
- promoting the twinning of training institutions in Lesotho with those outside the country to enhance skills transfer; and
- working with private industry to establish initiatives and programmes aimed at improving and upgrading the technical skills of existing employees (Isaacs, 2007b, pp. 6–7).

The policy also references the importance of healthcare delivery, gender equality and youth development through ICT.

²⁸ <http://planipolis.iiep.unesco.org/upload/Lesotho/Lesotho%20EDUCATION%20ACT%202010.pdf>

²⁹ <http://planipolis.iiep.unesco.org/upload/Lesotho/Lesotho%20Education%20Sector%20Strategic%20Plan.pdf>

³⁰ http://www.gov.ls/documents/Lesotho_ICT_Policy_Final.pdf

ICT Access and Use

The World Economic Forum (2015e) scores Lesotho at 3.2 on a scale of 1 to 7 in terms of Internet access to schools in 2013. Data on ICT access in education in Lesotho are not available. However, the ITU (2014) published the following ICT access data.

Table 12: ICT Access in Lesotho

Fixed telephone subscriptions per 100 inhabitants	2.8
Mobile cellular telephone subscriptions per 100 inhabitants	86.3
Mobile broadband subscriptions per 100 inhabitants	7.4
Households with a computer	6.4%
Households with Internet access at home	4.3%
Individuals using the Internet	5%

Source: ITU (2014)

There has been an increase in mobile subscriptions between 2010 and 2012 compared to fixed line subscriptions. However, Internet access remains very low. Based on their Network Readiness Index, the World Economic Forum (2015e) ranks Lesotho 124th out of 143 countries in 2015, compared with 138th out of 144 countries in 2013.

Major Priorities and Initiatives

National Initiatives

Lesotho has become home to a few key ICT in education pilot projects in recent years.

African Storybook Project, Lesotho Pilot Site

The African Storybook Project was established by SAIDE in partnership with Comic Relief in 2013. It aims to stimulate the provision and use of openly licensed stories in local African languages for early reading. The project has been conducting pilots in rural and urban areas in Kenya, Uganda, Lesotho and South Africa (SAIDE, 2013).

OER for Open Schooling

In 2008, COL launched a programme to train teachers from six Commonwealth countries on the development of open and distance learning (ODL) materials. Lesotho is one of the six countries. These teachers will then develop OER that can be freely downloaded, adapted and reused by open schools across the Commonwealth and beyond (Ferreira, 2012).

Lesotho School Technology Innovation Centre

Lesotho also hosts one of Microsoft's Africa School Technology Innovation Centres (STICs). The STIC is part of a global programme that promotes education through the use of technology. It helps teachers improve the quality of education in Africa by showcasing and piloting a range of innovative educational technologies within local contexts (Microsoft, 2010).

Literacy for Life

As part of exploring the best ways to advance literacy and education in the developing world, Literacy for Life launched its first pilot in 2014 in Lesotho to create content in their local language, Sesotho. The approach is to use low-cost Nokia phone devices to create e-books (Literacy for Life, 2012).

Institutional Initiatives

Lesotho has three main institutions of higher learning: the National University of Lesotho, the Lesotho College of Education, and the Lerotholi Polytechnic. In 2010, Lesotho joined the Pan-African e-Network to host tele-education classes at the National University of Lesotho's Learning Centre, which is hosted by the Institute of Extra-Mural Studies. This project aims to provide "tele-education" services to 10,000 African students to undertake post-graduate, undergraduate, post-graduate diploma, and diploma and

skill-enabling certification courses in subjects such as business administration, IT, international business, tourism and finance over a five-year period in Indian universities/educational Institutions. Its initial experiment with 200 students highlighted the prospect of further investment in the provision of ODL in Lesotho (Biao, 2012; ISTE Africa, 2012).

Prospects and Challenges

Lesotho has made slow progress regarding the use of ICT in education over the past few years. It has been the home for a few innovative projects. However, the country has now reached a stage where it has to revise its existing policies and plans because their target dates are currently 2015. The country remains beset with challenges, mainly infrastructural. ICT infrastructure remains limited, including limited access to an electricity infrastructure.

Where teachers and learners have had access to technologies, their integration in daily practice has been limited. However, that Lesotho received one of the Microsoft Global Innovative Teacher Awards in 2012 offered renewed hope for exploring the prospects for education improvement through ICT.

Malawi

Introduction and Background

Malawi is a constitutional democracy and had a population of 17.3 million in 2013. The country falls into the low human development category according to the UNDP (2014g). Malawi ranks 99th out of 143 countries in terms of the quality of its education system (WEF, 2015g). In 2013, it had a secondary education attainment rate of 21.6 per cent and a tertiary attainment rate of 1.3 per cent for its 25 to 54 age group (WEF, 2015g). Malawi has a high level of gender inequality, based on the UNDP's Gender Inequality Index (UNDP, 2014g).

Table 13: Basic Data about Malawi

Indicator	
Population (2013)	17.3 million
Languages	English
Economic activity	Agriculture
Human Development Index (2013)	0.414 (174 th out of 187 countries and territories)
Gender Inequality Index (2013)	0.591 (129 th out of 149 countries)
Per capita gross national income (2013)	USD 715
Life expectancy (2013)	55.3
Mean years of schooling (2013)	4.2
Tertiary educated population	80,000

Sources: Commonwealth Secretariat (2015), UNDP (2014g), WEF (2015g)

Policies and Laws

Policies and laws in education are guided by the Constitution of the Republic of Malawi, which was enacted in 1994. It commits the Malawian government to: providing adequate resources for the education sector; devising programmes that eliminate illiteracy; making primary education compulsory and free for all citizens; offering greater access to higher learning and continuing education; promoting national unity; and eliminating political, religious, racial and ethnic intolerance.

National Vision and Economic Frameworks

The Malawi government adopted Vision 2020,³¹ which envisages that by 2020, Malawi will be a “God-fearing nation that will be secure, democratically mature, environmentally sustainable, self-reliant with equal opportunities for and active participation by all, having social services, vibrant cultural and religious values and being a technologically driven middle-income economy” (Fortune of Africa, 2014).

The Vision has a dedicated human resource development component that states that Malawians aspire to have adequate and good quality social services, especially in education and health, and efficient and effective utilisation of human resources in both the public and the private sectors. Vision 2020 sets the conceptual parameters for subsequent policy, including national ICT policy (Isaacs, 2007c, p. 5).

National Policies and Strategies Related to TEL

The Malawian government was historically guided by its Education Act of 1962, which was at odds with the prescriptions of the Constitution. In 2013, it passed the new Education Act, making primary schooling compulsory.

The Government of Malawi also adopted an Education Sector Plan 2008–2017,³² which makes ICT infrastructure access in education a priority. It states that the computer-to-learner ratio should be reduced to 1:5 through the provision of computer labs, with the support of the private sector, and that seven additional PC labs should be built in the nation's technical colleges.

³¹ <http://www.sdn.org.mw/malawi/vision-2020/chapter-1.htm>

³² http://planipolis.iiep.unesco.org/upload/Malawi/Malawi_NESP.pdf

Whilst Malawi does not have an explicit national policy on ICT in education, the government adopted a National ICT Policy in 2003,³³ which was updated from its 2005 policy. The policy proposes the realisation of a knowledge-based economy by prioritising Malawi's improvement in education status through increased access to learning materials at all levels of the education system. It sets increased access to education facilities and increased skills in ICT as a policy outcome, and it states that the government will integrate ICT in education at all levels to boost education access and quality and improve the management of the nation's education systems (Government of Malawi, 2008).

ICT Access and Use

The World Economic Forum (2015e) scores Malawi at 2.7 on a scale of 1 to 7 in terms of Internet access to schools in 2013. Data on ICT access in education in Malawi are not readily available. However the ITU (2014) published the following ICT access data for 2013, reflecting very low levels of ICT access.

Table 14: ICT Access in Malawi

Fixed telephone subscriptions per 100 inhabitants	0.2
Mobile cellular telephone subscriptions per 100 inhabitants	32.3
Mobile broadband subscriptions per 100 inhabitants	3.9
Households with a computer	4.5%
Households with Internet access at home	6%
Individuals using the Internet	5.4%

Source: ITU (2014)

Based on their Network Readiness Index, the World Economic Forum (2015e) ranks Malawi 133^a out of 143 countries in 2015, compared with 129^b out of 144 countries in 2013.

Major Priorities and Initiatives

National Initiatives

The Malawian government has embarked on a few national initiatives to drive education improvement through ICT, including the following two.

Onebillion

The Ministry of Education, Science and Technology has partnered with a number of agencies on the One Billion Project,³⁴ which aims to make education accessible to one billion children.

In November 2014, the Royal Norwegian Embassy partnered with the Voluntary Service Organisation (VSO) to improve the quality of basic education for children in Malawi. The project will equip 53 primary schools across nine districts in Malawi with digital education technology and technical capacity. The goal is reaching out to 25,328 Standard 1 and Standard 2 school children, in aid of which 2,628 teachers will be trained to utilise technology and improve their pedagogy. Mobile tablet teaching will also reach out to 116 learners with special needs and 1,060 youths who have dropped out of school (Onebillion.org, 2015). This project is an extension of a 2010 pilot that reached 30,000 Malawian children with tablet-based learning, in a partnership involving EuroTalk,³⁵ the Scottish Government and Onebillion.

The project includes mobile apps that are available for Standards 1 to 4 learners in Chichewe, one of the local languages spoken in Malawi. Research based on a randomised control trial suggests that learners made significantly greater gains in early maths performance by working on these apps (Pitchford, 2013).

³³ <http://www.malawi.gov.mw/images%5CPublications%5CMalawi%20ICT%20Policy%20Final.pdf>

³⁴ <https://onebillion.org>

³⁵ <http://eurotalk.com/za>

Tablet Learning and Teaching Project

Similarly, the International Institute for Communication and Development has partnered with the Forum for African Women Educationalists in Malawi and the Association for Christian Educators in Malawi to pilot a tablet-based learning project involving the distribution of 60 tablets to learners and teachers at Malawi's Tsabango 1 primary school (Tembo, 2014).

Institutional Initiatives

College of Medicine, University of Malawi

One of Malawi's most significant interventions at the institutional level involves the College of Medicine at the University of Malawi.³⁶ It has invested in training and developing the skills of their teaching staff to be able to create interactive, open digital content that supports their teaching practice. The content includes interactive images and self-evaluation quizzes.

It has also created a curriculum management system that allows staff and students to track their course teaching and learning, respectively, throughout the academic year. The system also allows access to timetables, notices and resources that support their teaching.

In addition, the college has partnered with the University of Edinburgh in making available 400 digital teaching resources for their staff (College of Medicine, 2015).

Prospects and Challenges

Malawi remains constrained by ICT infrastructural challenges and limited human resource capacity to lead and manage large-scale, technology-enhanced education interventions. Much of the ICT in education programmes continue to be dependent on international donor support, which constrains their sustainability. It is also noteworthy that Malawi's 2005 ICT Policy expressed commitment to gender equality and women's empowerment, but this commitment is absent from its updated 2013 ICT Policy.

Malawi's policy environment is more conducive towards expanding access to education, especially for primary school children. Together, the Malawian government's revised Education Act, revised National Education Sector Plan and revised ICT policy open up the prospect of greater investment in TEL.

Malawi has also developed innovative institutions such as the College of Medicine at the University of Malawi, which seem to be showing other institutions the way to approach creating and using OER.³⁷

Notably, Malawi is one of the few countries to have included evidence-based research in their exploration of the role of mobile tablet PCs in improving early-grade mathematics learning.

³⁶ <http://www.medcol.mw>

³⁷ <http://www.medcol.mw>

Malta

Introduction and Background

Malta is a constitutional democracy with a small population of 430,000 as of 2013. The country falls into the high human development category according to the UNDP (2014h). It ranks 16th out of 143 countries in terms of the quality of its education system (WEF, 2015h). In 2013, it had a primary education attainment rate of 100 per cent and a secondary education attainment rate of 88.1 per cent for its 25 to 54 age group (WEF, 2015h). Malta has a low level of gender inequality, based on the UNDP's Gender Inequality Index (UNDP, 2014h).

According to the Commonwealth Secretariat (2015), Malta has a small domestic market, produces only about 20 per cent of the food it needs, and has no raw materials, a limited supply of fresh water and no energy resources other than solar energy. Its only resources are its ports and its educated and skilled people.

Table 15: Basic Data about Malta

Indicators	
Population (2013)	431,000
Languages	English, Maltese
Economic activity	Ship-building, manufacturing, tourism, financial and business services
Human Development Index (2013)	0.829 (39 th out of 187 countries)
Gender Inequality Index (2013)	0.220 (41 st out of 149 countries)
Per capita gross national income (2013)	USD 27,022
Life expectancy (2013)	79.8
Mean years of schooling (2013)	9.9
Tertiary educated population	54,000

Sources: Commonwealth Secretariat (2015), UNDP (2014h), World Economic Forum (2015h)

National Policies, Strategies and Programmes

The Government of Malta adopted its Constitution in 1964, establishing the country as a liberal parliamentary democracy and safeguarding the fundamental human rights of the people of Malta. Since then it has been amended 27 times. The Constitution stipulates compulsory, free primary education for all.

National Economic Frameworks

The Government of Malta adopted Vision 2020, which outlines its strategy for economic development. Within this, the growth of the international education services and ICT sectors rank amongst the country's most strategic areas. Malta is known for its growth from a low-end manufacturing economy to a high-end value-added economy over the past 20 years.

National Policies and Strategies Related to TEL

The Government of Malta adopted the Digital Malta: National Digital Strategy 2014–2020* in 2014; this serves as a framework and guide for Malta to become a central ICT hub that nurtures, creates and enables an entrepreneurial culture which encourages research and innovation. The strategy's vision is for Malta to be "a digitally-enabled country empowering its people, communities and entrepreneurs through the intelligent and universal use of ICT."

The strategy identifies key areas of action that target its citizens, business sector and government. Within the government sector, it contains a section on eLearning in which it states that a complete ICT infrastructure will be provided for educators, students and parents, encouraging a digital mind-set and widening learning opportunities. Educators will be supported to make full use of eLearning platforms and other digital learning technologies (Government of Malta, 2014a).

³⁸ <http://www.digitalmalta.gov.mt/en/Pages/Home.aspx>

The Government of Malta also adopted a “Smart Learning, eLearning Strategy” in 2008.³⁹ This strategy has three key foci: skills, infrastructure and content. Each of these three strategic areas highlights specific actions over a three-year period. The focus on skills highlight actions targeted at growing the skills of learners, teachers and leaders in education. The focus on infrastructure highlights the establishment of the requisite technological infrastructure to support professionals who can support learners. Here the actions centre on: providing computers and connectivity to schools and laptops to teachers; establishing standards for Internet and computer safety; providing appropriate eLearning platforms; and providing an enabling environment for managing school-related data (Government of Malta, 2008; Grima, 2010). Following the adoption and implementation of this strategy, the Government of Malta invested in 2011 in an eLearning solution known as the Fronter Platform, which is servicing the learning, teaching and administrative needs of all of Malta’s primary and secondary schools for a seven-year period (MITA, 2011).

ICT Access and Use

The World Economic Forum (2015e) scores Malta at 5.8 on a scale of 1 to 7 in terms of Internet access to schools in 2013. Data on ICT access in education in Malta are not readily available. However, the ITU (2014) published the following ICT access data for 2013, reflecting high levels of access.

Table 16: ICT Access in Malta

Fixed telephone subscriptions per 100 inhabitants	53.9
Mobile cellular telephone subscriptions per 100 inhabitants	129.8
Mobile broadband subscriptions per 100 inhabitants	40.6
Households with a computer	80.3%
Households with Internet access at home	78.8%
Individuals using the Internet	68.9%

Source: ITU (2014)

Based on their Network Readiness Index, the World Economic Forum (2015e) ranks Malta 29th out of 143 countries in 2015, compared with 28th out of 144 countries in 2013.

Major Priorities and Initiatives

National Initiatives

As part of its Digital Malta Strategy, the Government of Malta continued with the following initiatives in 2015.

Game Lectures and Game Nights

This involves the delivery of regular game lectures and game nights at the Institute of Digital Games, bringing researchers, students, developers and the public together around games. Lectures are delivered by local researchers as well as guest researchers from abroad.

One Laptop Per Child

The strategy also mentions the development of games for inclusion in the country’s OLPC initiative.⁴⁰ This is currently being piloted and is subject to monitoring and evaluation (Government of Malta, 2014).

³⁹ <http://vault.smarttech.com/uploads/linked/GETS-GraceGrima.pdf>

⁴⁰ <http://www.digitalmalta.gov.mt/en/Pages/Home.aspx>

Institutional Initiatives

Institute of Digital Games

This institute has partnered with the European Union's C2Learn⁴¹ project to develop an innovative digital gaming and social networking environment that incorporates diverse tools, the use of which can foster co-creativity in learning processes in the context of both formal and informal educational settings.

Prospects and Challenges

As a high-income country with a strong, sophisticated ICT infrastructure, solid education institutions that are producing globally competitive ICT users, a solid national strategy and national initiatives, Malta is in a league of its own compared to the Commonwealth countries in Africa.

One of the government's current challenges is that its Smart Learning Strategy is outmoded and will need to be updated. Whilst Malta ranks highly in terms of educational attainment, quality and equity relative to the other Commonwealth countries in Africa and the Mediterranean, there has been limited evaluation of the effectiveness of its Smart Learning Strategy and the strategy's contribution towards Malta's education system and labour market.

⁴¹ c2learn.ea.gr

Mauritius

Introduction and Background

Mauritius is a small island developing state of 1.3 million people as of 2013. According to a 2014 Government of Mauritius report, the 2012 Ibrahim Index of African Governance ranked Mauritius first in good governance, and the 2012 Democracy Index compiled by the Economist Intelligence Unit ranked Mauritius 18th out of 167 countries in terms of the state of its democracy. As a welfare state, Mauritius offers free healthcare services and free education from pre-primary to tertiary levels, which has reportedly contributed significantly to the country's economic and social advancement (Government of Mauritius, 2014). The country falls into the high human development category according to the UNDP (2014i), and it ranks 42nd out of 143 countries in terms of the quality of its education system (WEF, 2015i). In 2013, it had a primary education attainment rate of 99.8 per cent and a secondary education attainment rate of 76.1 per cent for its 25 to 54 age group (WEF, 2015i). Mauritius continues to reflect relative levels of gender inequality, based on the UNDP's Gender Inequality Index (UNDP, 2014i).

Table 17: Basic Data about Mauritius

Indicators	
Population (2013)	1.3 million
Languages	English, French-based Creole
Economic activity	Agriculture, manufacturing, tourism, financial services, ICT
Human Development Index (2013)	0.771 (63 rd out of 187 countries)
Gender Inequality Index (2013)	0.375 (72 nd out of 149 countries)
Per capita gross national income (2013)	USD 16,777
Life expectancy (2013)	73
Mean years of schooling (2013)	8.5
Tertiary educated population	35,000

Sources: Commonwealth Secretariat (2015), UNDP (2014i), WEF (2015i)

National Policies, Strategies and Programmes

The Constitution of the Government of Mauritius is the supreme law governing all other laws and policies, including in education. It was adopted in 1968 and defines Mauritius as a sovereign democratic state (Government of Mauritius, 1968).

National Economic Frameworks

In 1997, the Government of Mauritius adopted Vision 2020: The National Long-Term Perspective Study⁴² as its core development strategy to promote sustainable development in the country. Vision 2020 envisages a scenario for promoting development based on gains in agricultural efficiency, tourism, industrial production and the development of financial and value-added services. Based on this vision, the Mauritian government restructured its sugar and textile sectors, developed an offshore financial sector, strengthened and liberalised its telecommunications system, developed new incentive schemes for IT and pioneering firms, established a Cyber Park, doubled its state secondary school capacity, modernised its port facilities and established the Mauritius Freeport.

In 2008, the government adopted the Maurice Ile Durable⁴³ framework and the Economic and Social Transformation Plan. This framework and plan focus on five sectors: energy; environment; employment and economy; education; and equity.

With reference to education, the plan envisages an education system that promotes the holistic development of all citizens. The goals are, by 2020, to achieve 100 per cent literacy and be an internationally recognised knowledge hub for sustainable development in the region (Government of Mauritius, 2014).

⁴² <http://www.mrc.org.mu/Projects/NRFE/NRFE%20WP2%20wp1.pdf>

⁴³ <http://mid.govmu.org/portal/sites/mid/index.html>

National Policies and Strategies Related to TEL

In 2007, the government adopted a National ICT Policy,⁴⁴ followed by a National ICT Strategic Plan 2007–2011.⁴⁵ This ICT Strategic Plan states that it will facilitate “sustained superior quality of talent pool in Mauritius through interventions at the foundational levels of educational system aimed at instilling a spirit of lifelong learning” (PricewaterhouseCoopers, 2007). It also commits to promoting ICT as an enabler in improving the Mauritian education system.

Following a review of its 2007–2011 ICT Strategic Plan in 2010, the government adopted its 2011–2014 ICT Strategic Plan, titled Towards iMauritius,⁴⁶ which focuses on making the ICT sector the main pillar of the economy. On the basis of this plan, the government implemented their ICT Skills Development Programme and the ICT Academy.

It also adopted a Broadband Policy 2012–2020,⁴⁷ which promotes high-speed broadband access for all education institutions. However, Mauritius does not have a dedicated ICT in education policy.

ICT Access and Use

The World Economic Forum (2015e) scores Mauritius at 4.4 on a scale of 1 to 7 in terms of Internet access for schools in 2013. Other data on ICT access in education in Mauritius are not readily available. However, the ITU (2014) published the following ICT access data for 2013, reflecting relatively high levels of access compared to many other African countries.

Table 18: ICT Access in Mauritius

Fixed telephone subscriptions per 100 inhabitants	29.2
Mobile cellular telephone subscriptions per 100 inhabitants	123.2
Mobile broadband subscriptions per 100 inhabitants	28.8
Households with a computer	48.5%
Households with Internet access at home	44.5%
Individuals using the Internet	39%

(Source: ITU, 2014)

Based on their Network Readiness Index, the World Economic Forum (2015e) ranks Mauritius 45th out of 143 countries in 2015, compared with 55th out of 144 countries in 2013.

Major Priorities and Initiatives

National Initiatives

Mauritius Tablet PC Project

The Government of Mauritius through its Ministry of Education and Human Resources has embarked upon large-scale, tablet PC roll-out projects in Africa. In 2013, it committed to distributing 20,000 tablets to each Form IV student. These tablets were equipped with pedagogical content relevant to Forms IV and V curricula, aligned with the teaching of the Cambridge GCE O Level syllabi for Mauritius.

This project catalyses a paradigm shift in teaching and learning at the secondary level, improving learning by providing students with “anytime, anywhere” learning opportunities so that they can become independent learners. A stated objective is also to improve the pass rate of students and ensure they are well equipped with 21st-century skill sets. By 2015, it had rolled out 26,000 tablet PCs to all Form IV students (Government of Mauritius, 2013).

⁴⁴ http://www.ist-africa.org/home/files/Mauritius ICTPolicy_2007-11.pdf

⁴⁵ <http://unpan1.un.org/intradoc/groups/public/documents/cpsi/unpan030903.pdf>

⁴⁶ <http://mtci.govmu.org/English//DOCUMENTS/NICTSP20112014.PDF>

⁴⁷ <https://www.icta.mu/documents/nationalbroadbandpolicy2012.pdf>

Tertiary Education Commission (TEC)

The TEC oversees the seven public tertiary institutions in Mauritius. It assumes responsibility for public funds allocation and the co-ordination of post-secondary education and training in Mauritius. It is also mandated to regulate private post-secondary institutions and ensure programme accreditation.

In 2013, the TEC adopted a Distance Education Policy, which states that it will develop and host an OER Platform to provide space for sharing distance education resources and instructional materials. The platform will also enable the sharing of best practices within the tertiary education community (TEC, 2015).

In 2014, the TEC hosted an OER workshop in partnership with COL. The objectives were to build the capacity of the participants and establish the terms of reference for collaboration on the OER Platform. Amongst the host of expected outcomes of the workshop was an agreement on the scope of a proposed OER policy for Mauritius and the preparation of a draft outline of the policy. It also aimed to discuss the capacity building needed to establish the technical requirements for the platform (TEC, 2015).

Institutional Initiatives

University of Mauritius

The University of Mauritius, with approximately 4,000 students, is one of the country's leading tertiary institutions (Gunness, 2012). It has a Centre for Innovative Lifelong Learning,⁴⁸ which is a specialised centre focused on promoting lifelong learning through eLearning programmes. The Centre was established in 2014 and currently runs a range of online programmes and courses. For example, in partnership with the Australian–Africa Universities Network, it hosts an online Postgraduate Certificate in Rapid eLearning Methodology, which equips educators with skills to integrate ICT in education.

The Centre runs short courses as well as eLearning programmes that lead to an accredited Master's degree (Centre for Innovative Lifelong Learning, 2015).

Prospects and Challenges

The Mauritian government has historically based itself on the Singaporean model of growing an innovative economy. They have an enabling policy environment and have been successful at implementing their policies and programmes nationally. In this respect, Mauritius has shown strong leadership and political will to grow their economy and education system through the integration of ICT.

Some of the gains include the mainstreaming of science and technology in all sectors of the economy. In the education sector, ICT facilities have been improved in all schools (Government of Mauritius, 2014).

One of their challenges is that they do not have a dedicated ICT in education policy, even though their existing policies and strategies strongly emphasise making changes in learning and teaching practices and growing 21st-century skills through technologies. Mauritius also has not demonstrated the extent to which their policies and programmes have improved learning, teaching and education system delivery.

⁴⁸ <http://vciltuom.ac.mu/cill>

Mozambique

Introduction and Background

Of the 27.1 million people in Mozambique, an estimated 31 per cent live in urban areas. Mozambique is categorised as a low human development country by the UNDP (2014j), and it ranks 123rd out of 143 countries in terms of the quality of its education system (WEF, 2015j). In 2013, it had a secondary education attainment rate of 18.7 per cent and a tertiary attainment rate of 1.2 per cent for its 25 to 54 age group (WEF, 2015j). Mozambique also has a high level of gender inequality, based on the UNDP's Gender Inequality Index (UNDP, 2014j).

Table 19: Basic Data about Mozambique

Indicators	
Population (2012)	27.1 million
Language	Portuguese
Economic activity	Agriculture
Human Development Index (2013)	0.393 (178 th out of 187 countries and territories)
Gender Inequality Index (2013)	0.657 (44 th out of 149 countries)
Per capita gross national income (2013)	USD 1,011
Life expectancy (2013)	50.3
Mean years of schooling (2013)	3.2
Tertiary educated population	159,000

Sources: Commonwealth Secretariat (2015), UNDP (2014j), WEF (2015j)

National Policies, Strategies and Programmes

The supreme law of the Government of Mozambique is its Constitution, which was adopted in 1990. It informs and governs all laws and policies related to education and ICT (Government of Mozambique, 1990).

National Economic Frameworks

The Government of Mozambique has developed a long-term framework and vision for economic growth and development, referred to as Agenda 2025. The framework situates the government's strategies in the historical context of Mozambique's economic and social conditions before and after independence. In a SWOT analysis, it highlights a number of weaknesses, such as high school dropout rates and high ratios of learners to teachers. However, it also identifies a number of opportunities, such as the expansion of their school network, globalisation and technological development, the expansion of their radio and TV networks, and the use of information technologies as auxiliary means for education and scientific research. It also identifies four scenarios for the country's future development, as well as the most desirable scenario on which the country strategy should be based. It recognises the worth in women's education and highlights the importance of values related to family and community in education, as well as the need to strengthen the country's success in literacy and schooling and improve the quality of teacher training. It also mentions the importance of scientific and technological education (Committee of Councillors, 2003).

National Policies and Strategies Related to TEL

Mozambique was amongst the first African countries to develop a national ICT policy.⁴⁹ Its current policy was adopted in 2002, accompanied by an implementation strategy. One of the main focus areas of the policy and strategy was digital inclusion that moves beyond mere access to ICT and emphasises how people can use ICT to improve their lives. The policy has the following objectives:

- to contribute to the fight against poverty and improve the living standards of Mozambicans;
- to increase citizens' access to knowledge;
- to improve the effectiveness and efficiency of public services;

⁴⁹ http://www.ist-africa.org/home/files/Mozambique_ICTPolicy_2000.pdf

- to change Mozambique into a producer, rather than a mere consumer, of ICT; and
- to make Mozambique, in time, a competitive player in the global information society.

Its ambitious implementation plan included 37 different projects. So far, the policy and strategy has made some gains. In education, this includes equipping secondary schools with computers through the SchoolNet programme, piloting both an ICT curriculum for secondary schools and university-level distance education, and growing private sector computer courses and activities (Panos London, 2011).

ICT Access and Use

The World Economic Forum (2015j) scores Mozambique 2.8 on a scale of 1 to 7 in terms of Internet access for schools in 2013. Data on ICT access in education in Mozambique are not readily available. However, the ITU (2014) published the following ICT access data for 2013, reflecting very low levels of access.

Table 20: ICT Access in Mozambique

Fixed telephone subscriptions per 100 inhabitants	0.3
Mobile cellular telephone subscriptions per 100 inhabitants	48
Mobile broadband subscriptions per 100 inhabitants	1.8
Households with a computer	6.7%
Households with Internet access at home	4.6%
Individuals using the Internet	5.4%

(Source: ITU 2014)

Based on their Network Readiness Index, the WEF (2015j) ranks Mozambique 129^a out of 143 countries.

Major Priorities and Initiatives

Mozambique Information and Communication Technology Institute

The Mozambique Information and Communication Technology Institute⁵⁰ (MICTI) is a multifaceted initiative focused on addressing the challenges of skills shortage, post-secondary education and a weak ICT sector. MICTI aims, through ICT applications and research, to serve the country's broader governance, social services delivery and economic development needs. It has several components, including learning, research and technology. The long-term goal is to place the institute and job incubation activities into a science park environment (Isaacs, 2007e).

Mozambique Research and Education Network

Mozambique Research and Education Network⁵¹ (MoRENet) was established by the Ministry of Science and Technology in 2005. This national research and education network (NREN) is a nationwide data network that interconnects academic and research institutions. Intended to be a framework for the fast and efficient exchange of research data amongst its members, its main philosophy is to take advantage and make use of the country's existing fibre infrastructure. The network accommodates both public and private academic institutions and research centres (UbuntuNet Alliance, 2007).

Prospects and Challenges

The Mozambique government has been at the forefront in promoting ICT in education in Africa. Since establishing its ICT policy commission in 1998 to develop a national ICT policy, it has created an enabling environment to support further investment in ICT across different sectors, including education. To date, however, Mozambique lacks a dedicated ICT in education policy and remains challenged by limited human resource capacity, dependence on donor aid and ICT infrastructure constraints.

⁵⁰ <http://www.micti.co.mz/micti/index.php>

⁵¹ <https://archive.ssvl.kth.se/csd/0601>

Namibia

Introduction and Background

Namibia is the second most sparsely populated country in the world, with a population of 2.4 million people in a vast land of 825,418 square kilometres. Whilst it has a high per capita income, Namibia also has high levels of income inequality. The country falls into the medium human development category according to the UNDP (2014k), which ranks Namibia 127th out of 187 countries in terms of the Human Development Index. Namibia ranks 107th out of 143 countries in terms of the quality of its education system (WEF, 2015k). In 2013, it had a secondary education attainment rate of 29.5 per cent and a tertiary attainment rate of 5.5 per cent for its 25 to 54 age group (WEF, 2015k). Namibia has a relatively medium level of gender inequality, based on the UNDP's Gender Inequality Index (UNDP, 2014k).

Table 21: Basic Data about Namibia

INDICATORS	
Population (2012)	2.4 million
Languages	English, Oshiwambo, Herero, Nama, Afrikaans and German
Economic activity	Mining, fish processing, eco-tourism
Human Development Index (2013)	0.624 (127 th out of 187 countries and territories)
Gender Inequality Index (2013)	0.450 (87 th out of 149 countries)
Per capita gross national income (2013)	USD 9,185
Life expectancy (2013)	64.5
Mean years of schooling (2013)	6.2
Tertiary educated population	61,000

Sources: Commonwealth Secretariat (2015), UNDP (2014k), WEF (2015k)

Policies, Strategies and Programmes

Policies and laws in education are guided by the Constitution of the Republic of Namibia, which was adopted in 1990 and represents a milestone in the country's historical struggle against institutionalised racial segregation. The Constitution stipulates that everyone has the right to education, that free primary education is compulsory and that the state will provide the required facilities to give effect to these rights.

National Economic Frameworks

The Namibian government adopted Vision 2030, which envisages that by 2030, the quality of life of Namibians will improve to the level of their counterparts in the developed world.

The goal is for Namibia to become a healthy and food-secure nation, in which all preventable, parasitic and infectious diseases (including HIV/AIDS) are under control, and where people enjoy a high standard of living, good quality of life and have access to quality education, healthcare and other vital services.

In support of the objectives of 2030, capacity building will be pursued by both the private and the public sectors and will continue to be promoted by the existence of a suitable enabling environment in terms of political stability and freedom, a sound legal system, economic resources and opportunities, and social norms that are conducive to sustained development.

As required by Vision 2030, the country will operate a totally integrated, unified, flexible and high-quality education and training system that prepares Namibian learners to take advantage of a rapidly changing global environment, including developments in science and technology. Arising from its overall capacity-building investments, Namibia will be transformed into a knowledge-based society (Government of Namibia, 2004).

National Policies and Strategies Related to TEL

The Government of Namibia adopted a 15-year Education and Training Sector Improvement Plan for 2005 to 2020,⁵² which outlines a number of bold objectives, such as improving access to ICT to enhance learning and administration, and making ICT a subject and a cross-curricular tool. It also prescribes staff training in ICT and the development of support services and structures for ICT deployment and maintenance.

The government also adopted an IT Policy in 2008,⁵³ which builds on the previous ICT Policy adopted in 2004. The latest policy, along with the government's Telecommunications Policy and Broadcast Policy, inform the use of IT, telecommunications and broadcast to support education and training. It makes very specific policy statements regarding education and skills training — for example, that the government will:

- stimulate the development of ICT skills through the establishment of ICT Centres of Excellence at centres of further learning;
- allocate funds toward the development of centres (study centres and laboratories) at the tertiary level;
- where possible, form partnerships with industry to develop ICT skills in Namibia;
- include IT training as part of the educational curricula, starting in primary school;
- facilitate the establishment of institutions of ICT learning in smaller towns;
- place major emphasis on ICT education at all levels of education as a prerequisite for the future competitiveness of Namibia skills development; and
- provide tax incentives for ICT skills development by the private sector (Government of Namibia, 2009).

Namibia also has a dedicated ICT in Education Policy,⁵⁴ which was adopted in 2005. The priority areas for the policy are: colleges of education and related in-service programmes; schools with secondary grades; teacher education programmes at tertiary institutions; vocational training institutions; primary schools; libraries and community centres; adult education centres; and special needs education programmes. The policy objectives are to:

- produce ICT literate citizens;
- produce people capable of working and participating in the new information- and knowledge-based economy and society;
- leverage ICT to assist and facilitate learning for the benefit of all learners and teachers across the curriculum;
- improve the efficiency of educational administration and management at every level, from the classroom and school library, through the school, and on to the sector as a whole;
- broaden access to quality educational services for learners at all levels of the education system; and
- set specific criteria and targets to help classify and categorise the different development levels of using ICT in education (Isaacs, 2007f).

In addition, the Namibian Ministry of Education established an implementation programme in 2007, entitled Tech/NA!,⁵⁵ which was designed to manage and implement ICT roll-out to institutions, educate teachers and learners, and empower whole communities.

⁵² http://planipolis.iiep.unesco.org/upload/Namibia/Namibia_ETSIP_2005-2020.pdf

⁵³ http://www.researchafrica.net/countries/namibia/NMICT_IT_Policy_2008.pdf

⁵⁴ http://www.nied.edu.na/publications/AdditionalDocuments/AdditionalDocuments/Published_ICT_Policy_2005-15March2005.pdf

⁵⁵ <http://www.unesco.org/iiep/PDF/pubs/NamibiaTechNa.pdf> (note: this project is no longer active).

ICT Access and Use

Data on ICT access in education in Namibia are not readily available. However, the ITU (2014) published the following ICT access data for 2013, reflecting very low levels of access in general except for mobile cellular subscriptions.

Table 22: ICT Access in Namibia

Fixed telephone subscriptions per 100 inhabitants	8
Mobile cellular telephone subscriptions per 100 inhabitants	110.2
Mobile broadband subscriptions per 100 inhabitants	34.2
Households with a computer	15.4%
Households with Internet access at home	16%
Individuals using the Internet	13.9%

Source: ITU (2014)

Based on their Network Readiness Index, the World Economic Forum (2015e) ranks Namibia 102nd out of 143 countries in 2015.

Major Priorities and Initiatives

National Initiatives

Namibian Open Learning Network Trust

The Namibian Open Learning Network Trust (NOLNet) is a joint initiative of the Ministry of Education, the University of Namibia, the Namibian College of Open Learning (NAMCOL), the Polytechnic of Namibia and the National Institute for Educational Development (NIED). The purpose of NOLNet is to foster collaboration amongst a network of open learning centres where services and resources can be shared.

Through NOLNet, the staff of institutions that are part of the network are trained and resources are shared amongst staff and students across institutions. NOLNet's services include the provision of advice and counselling for prospective students of partner institutions. NOLNet also supports adults and youths who are not registered in formal learning programmes. It is pursuing the development and expansion of OER access for the teachers and students in their network of institutions.

Namibia eLearning Centre

The Namibian eLearning Centre was founded in 2010 and focuses on content development and e-capacity building through blended eLearning programmes, which they run based on requests from Namibian public and private education and training institutions. The Centre also provides training in e-skills development as part of a long-term partnership with the German international development company GIZ.

Institutional Initiatives

Namibian College of Open Learning

The Namibian College of Open Learning⁵⁶ (NAMCOL) recently launched an educational campus radio station, which streams live on the Internet. Its purpose is to support NAMCOL students, especially those who are based in remote areas and studying through distance learning. The radio hosts lectures on different subjects that are offered both at NAMCOL and at school. These are currently pre-packaged, although live tutorials are being planned.

NAMCOL has also been involved in a range of OER projects and partnerships. It partnered with COL and The William and Flora Hewlett Foundation on an open schooling project that involved the development of self-study OER in secondary school subjects. NAMCOL also partnered with the

⁵⁶ <http://www.namcol.edu.na>

Namibian Ministry of Education in the development of self-study OER in five secondary school subjects (NAMCOL, 2015).

Prospects and Challenges

Namibia has a well-established ICT infrastructure due to its relationship with neighbouring South Africa. Its policy environment enables the education system to deliver on the promise of improved learning and teaching. However, Namibia has had challenges with implementing its policies and plans in recent years, and its role as a front runner in ICT in education in Africa has been declining. Nonetheless, in the sphere of open learning and the creation and use of OER, Namibian institutions have been innovative.

Nigeria

Introduction and Background

Nigeria is the most populous country in Africa, with 183.5 million people in 2013. It is, however, considered a country with low human development according to the UNDP (2014), and it ranks 121st out of 143 countries in terms of the quality of its education system (WEF, 2015). In 2013, Nigeria had a secondary education attainment rate of 56.3 per cent and a tertiary attainment rate of 15 per cent for its 25 to 54 age group (WEF, 2015).

Table 23: Basic Data about Nigeria

Indicators	
Population	183.5 million
Languages	English
Economic activity	Oil and gas production
Human Development Index (2013)	0.504 (152 nd out of 187 countries and territories)
Per capita gross national income (2013)	USD 5,353
Life expectancy (2013)	52.5
Mean years of schooling (2013)	5.2
Tertiary educated population	11,277,000

Sources: Commonwealth Secretariat (2015), UNDP (2014), WEF (2015)

National Policies, Strategies and Programmes

Policies and laws in education are guided by the latest Constitution adopted by the Nigerian federal government in 1999, which instils democratic rule.

National Vision and Economic Frameworks

In 2009, the Nigerian federal government adopted Vision 20:2020,⁵⁷ which is a blueprint for the country's economic development. The overarching goal is for Nigeria to become one of the top 20 economies in the world by 2020. The Vision is to be implemented through three successive national development plans: 2010–2013, 2014–2017 and 2018–2020.

With reference to education, the government's aspiration is for a modern and vibrant educational system that meets international standards of quality education, is accessible and is adequately aligned to the changing needs of Nigerian society and the demands of industry.

National Policies and Strategies Related to TEL

The federal government of Nigeria adopted a National Policy for Education in 1977, which was updated in 1981, 1998, 2004 and 2005.⁵⁸

The government also, in 2010, adopted a National Policy on ICT in Education, which defines a broad vision for ICT integration that encompasses "engaging, empowering, enriching and enabling" ICT-furthered education (Government of Nigeria, 2010b). The policy objectives include the following:

- To facilitate the teaching and learning processes.
- To promote problem-solving, critical thinking and innovative skills.
- To promote lifelong learning.
- To enhance the various teaching/learning strategies required to meet the needs of the population.
- To foster research and development.

⁵⁷ <http://www.nationalplanning.gov.ng/images/docs/NationalPlans/nigeria-vision-20-20-20.pdf>

⁵⁸ http://www.ajcmet.com/journals/Vol_2_No_7_July_2012/21.pdf

- To support effective and efficient education administration.
- To enhance universal access to information.
- To widen access to education and the range of instructional options and opportunities for anywhere, anytime, any-place and any-path learning.

To implement the policy, the focus is on:

- encouraging the development of the ICT manpower required for ICT-furthered education,
- establishing the ICT infrastructure platform for education,
- encouraging the development of a national education and research infrastructure,
- ensuring and encouraging ICT research and development,
- providing appropriate legal, regulatory and security frameworks to ensure ICT-furthered education, and
- adopting creative financing models for ICT in education.

A key focus in the policy documentation is on the use of technology to transform the roles of teachers and learners in the classroom. Teachers will be transformed from knowledge experts to knowledge facilitators, guiding students to become independent learners. Students will be transformed from passive to active participants in their own learning, becoming seekers and constructors of knowledge (Government of Nigeria, 2010b).

The federal Ministry of Education also adopted a National Information Technology Education Framework in 2010, which provides an implementation plan for the National ICT in Education Policy. The framework focuses on the development of appropriate skills, competencies and attitudes and provides criteria for the accreditation of IT training institutions. It also presents guidelines for the regulation, categorisation and registration of non-formal IT training institutions and minimum standards for a range of areas, including physical facilities, computer equipment, curriculum, examination and assessment. As well, it provides minimum ICT-related standards for primary and junior secondary schools and for colleges of education (Government of Nigeria, 2010a).

In 2011, the National Commission for Colleges of Education Nigeria, the World Bank and the Global Schools and Communities Initiative developed a pilot project to establish an ICT Competency Framework for Teachers in Nigeria (Hooker, Mwiyeria, & Verma, 2011a).

In 2012, the Ministry of Communication Technology adopted a National ICT Policy,⁵⁹ which is still in draft form. It provides a comprehensive framework for the ICT sector that will encourage and stimulate investment and also enable rapid expansion of ICT networks and services that are accessible to all at reasonable costs. It addresses 23 thematic areas that are of critical importance, including policy and regulatory frameworks, Internet and broadband development, local content, co-ordinated ICT development across all sectors, national security, and safety. The policy also highlights the need for significant investment in ICT skills development. In this respect, it sets the following objectives:

- to integrate ICT into the national education curriculum;
- to promote a culture of lifelong learning;
- to promote the development of ICT-skilled personnel; and
- to support training and capacity building amongst public sector employees in the development and use of ICT tools and applications to improve the delivery of government services (Ministerial Committee on ICT Policy Harmonisation, 2012).

Strategies to realise these objectives include:

- establishing globally competitive training institutions in the field of ICT;
- introducing mandatory training and appropriate courses in ICT at all tiers of education;
- encouraging continuous training for professionals through specialised training institutes;

⁵⁹ [http://www.researchictafrica.net/countries/nigeria/Nigeria_National_ICT_Policy_\(draft\)_2012.pdf](http://www.researchictafrica.net/countries/nigeria/Nigeria_National_ICT_Policy_(draft)_2012.pdf)

- fostering an ICT-driven education administration environment;
- training and retooling teachers and facilitators at all levels to enhance their ICT competence;
- promoting ICT awareness and proficiency in mass and non-formal education, with an emphasis on children, youth, women and the physically challenged;
- promoting the development of instructional materials in electronic format; and
- developing and implementing ICT training programs for public sector employees, in connection with the implementation and institutionalisation of e-government and other digital functions within government offices (Ministerial Committee on ICT Policy Harmonisation, 2012).

ICT Access and Use

The World Economic Forum (2015e) scores Nigeria 3.4 on a scale of 1 to 7 in terms of Internet access in schools. The ITU (2014) published the following ICT access data for 2013, reflecting low levels of mobile broadband access.

Table 24: ICT Access in Nigeria

Fixed telephone subscriptions per 100 inhabitants	0.2
Mobile cellular telephone subscriptions per 100 inhabitants	73.3
Mobile broadband subscriptions per 100 inhabitants	10.1
Households with a computer	8.4%
Households with Internet access at home	7.8%
Individuals using the Internet	38%

Source: ITU (2014), WEF (2015e)

Based on their Network Readiness Index, the World Economic Forum (2015e) ranks Nigeria 119th out of 143 countries in 2015.

Major Initiatives

National Initiatives

Open Data Development Initiative

The Nigerian Ministry of Communication Technology established the Open Data Development Initiative in 2014 to enable access to government data in ways that can drive innovation, investment and economic growth. The initiative involves making government information and data freely available and searchable, and encouraging feedback, information sharing and accountability. It has been a consultative process thus far, and it is expected open up high-value datasets from across government ministries to Nigerian citizens, businesses and the rest of the world, for free. The initiative is supported by the World Bank and the United Kingdom's Department for International Development (Ifebhor, 2014).

Skool Nigeria.com

The Skool Nigeria initiative provides digital resources to learners and teachers, accompanied by teacher development programmes. It was established as a partnership between Intel, Shell and the Education Tax Fund of Nigeria and is the latest in a series of worldwide initiatives by Intel in the education sector (Skool Nigeria, 2015).

Open Imo

The Government of the State of Osun announced in 2013 that it is providing 150,000 eLearning tablets for senior secondary schools. The solar-powered tablets will be pre-loaded with content based on 17 core subjects, with five or more extracurricular subjects for senior secondary Levels 1, 2 and 3. Each tablet contains over 56 textbooks, 900 minutes of virtual classroom lessons and many practice exam questions. The state government has already conducted a pilot test in one school and is currently distributing the

tablets to other schools. To provide ongoing technical maintenance and support, the state government is also supporting the establishment of an assembly and maintenance plan (State of Osun, 2015).

Institutional Initiatives

National Open University of Nigeria (NOUN)

The National Open University of Nigeria is an ODL institution with 63 study centres across Nigeria and a student population of over 120,000, making it one of Nigeria's largest universities. NOUN has an OER unit, located in their vice-chancellor's office, which delivers courses through a combination of web-based modules, print-based materials, audio and video tapes, and CD-ROMs. NOUN has also adopted an OER Policy,⁶⁰ which is a "living document" and encourages NOUN's staff and students to use, create and publish OER to enhance the learning experience at the university (NOUN, 2015b).

Obafemi Awolowo University (OAU) Centre for Distance Learning

OAU is one of six universities in Nigeria that were mandated to apply dual-mode education delivery. Established in 2008, OAU subsequently created the Centre for Distance Learning, which offers online degree and sub-degree programmes. Its vision is to expand the reach of education that is open, flexible and accessible worldwide — anywhere, anytime, and to virtually anyone who seeks it — and that is responsive to the challenges of a rapidly changing world.

Prospects and Challenges

Nigeria has taken important steps towards providing an enabling and supportive policy environment for the adoption of TEL. A few examples are the adoption of a dedicated ICT in education policy and implementation plan and an updated ICT policy.

Nigeria has also initiated a number of leading projects that promote the use of digital technologies, and some of its higher education institutions have taken action to harness the potential of eLearning and OER.

Some of Nigeria's state governments are also demonstrating initiative in encouraging access to digital resources for learners in schools. However, some of these initiatives make no reference to the training and professional development of teachers to encourage the optimal use of various technologies for learning and teaching.

Nigeria's education performance remains very low in comparison to a number of African countries. The federal government continues to be constrained by human resource capacity and expertise when trying to ensure the optimal management and roll-out of TEL programmes. The country is also challenged by ongoing infrastructure problems, which militate against the effective use of digital technologies for learning and teaching.

⁶⁰ http://www.moocestest.vm-host.net/files/NOUN_OER_POLICY_20150204.docx

Rwanda

Introduction and Background

Rwanda is considered a low human development country (UNDP, 2014m). Of its 12.4 million people, 19 per cent live in urban areas. Rwanda ranks 50th out of 143 countries in terms of the quality of its education; in 2013, it had a secondary education attainment rate of 17.8 per cent and a tertiary education attainment rate of two per cent for its 25 to 54 age group (WEF, 2015m).

Table 25: Basic Data about Rwanda

Indicators	
Population (2013)	12.4 million
Languages	English, Kinyarwanda, French
Economic activity	Eco-tourism, mining
Human Development Index (2013)	0.506 (151 st out of 187 countries and territories)
Gender Inequality Index (2013)	0.410 (79 th out of 149 countries)
Per capita gross national income (2013)	USD 1,403
Life expectancy (2013)	64.1
Mean years of schooling (2013)	3.3
Tertiary educated population	87,000

Sources: Commonwealth Secretariat (2015), UNDP (2014m), WEF (2015m)

Between 1980 and 2013, Rwanda's Human Development Index rose from 0.357 to 0.506, which is one indication of the country's progress during that time. Rwanda also has a lower level of gender inequality compared than many other African countries, based on the UNDP's Gender Inequality Index.

National Policies, Strategies and Programmes

Policies and laws in education are guided by the Constitution of the Republic of Rwanda, which was adopted by referendum in 2003 and amended in 2010. The Constitution stipulates the right to education, guarantees freedom of learning and teaching in accordance with conditions determined by law, promotes free compulsory primary education and specifies the need for the state to take special measures to facilitate the education of disabled people (Constitute Project, 2015).

National Vision and Economic Frameworks

The Government of Rwanda adopted Vision 2020⁶¹ in 2000, which envisages that Rwanda will become a middle-income country by 2020. Integral to Vision 2020 is the contribution of ICT towards Rwanda's socio-economic development, including the transformation of its education sector. Science, technology and ICT are cross-cutting issues across six major pillars, one of which includes human resource development and building a knowledge-based economy.

The Vision also has gender equality as a cross-cutting theme. It specifically highlights the minority status of girls in secondary schools and the limited opportunities and decision-making positions for women at the time when the Vision document was formulated. It articulates a need to foster gender equality by promoting the secondary education of girls and furthering opportunities for women (Isaacs, 2011).

National Policies and Strategies Related to TEL

The Government of Rwanda also adopted a National Information and Communication Infrastructure (NICI) Plan in 2002, which is its most comprehensive policy framework on ICT and development. The plan's first stage (2000–2005) prepared the groundwork for the ICT sector, including establishing institutional, legal and regulatory frameworks, as well as opening up the telecom market by reducing barriers for entry.

During the second stage (2005–2010), Rwanda concentrated on enhancing its ICT infrastructure by establishing a national data centre that centralises information storage, management and protection and uses cloud computing opportunities. In addition, a national fibre-optic backbone network that connects

⁶¹ <https://repositories.lib.utexas.edu/bitstream/handle/2152/5071/4164.pdf?sequence=1>

Rwanda to international sea cables was deployed, increasing Internet accessibility and affordability as well as connecting Rwandans to global networks.

The third NICI Plan covered the period 2011 to 2015 and focused on service development in e-government, community development, private sector development, cyber security, and skills development. These were later reassessed, and a new ICT Sector Strategic Plan was developed for 2013 to 2018. The implementation of this plan is currently underway. Through these plans, Rwanda has been able to build a basic ICT infrastructure, establish improved health care and increase access to financial services (Government of Rwanda, 2015b).

In 2015, the government adopted the Smart Rwanda Master Plan 2015–2020,⁶² which draws on the experience and achievements of the NICI Plans and the ICT Sector Strategic Plan. This Master Plan focuses on: driving global competitiveness and job creation; generating a smart, innovative economy; and leveraging ICT innovation to transform Rwanda into a smart society. Improving the quality of education enabled by digital content is included amongst the Master Plan's objectives, and education is one of the seven pillars that underpin the plan.

The government also adopted the Education Sector Strategic Plan (ESSP),⁶³ a broader education policy framework that is strongly informed by the Education for All goals. A central feature of the ESSP is the government's goal to achieve fee-free education for the first nine years of schooling. The latest ESSP, 2010–2015, re-emphasises fee-free education, HIV, trilingualism, science and technology, and ICT. It also stresses achieving equitable educational access, improving the quality of educational provision and promoting skills development to meet labour market demands.

Against this backdrop, a draft ICT in Education Policy⁶⁴ and a related Costed Strategic Implementation Plan for ICT in Education was developed in 2008. Both focus on integrating ICT in education to achieve quality, access, equity and labour-market relevance. These principles balance education development with social redress and pragmatic economic and labour-market imperatives.

The policy and implementation plan highlight four major focus areas to be addressed by the Ministry of Education. These four areas relate to raising the awareness of all stakeholders in the education system about the value of investing in technology. This awareness is linked to preparing schools to accept, procure and install technology. In addition, the policy and plan propose to implement an education management information system and provide ongoing technical support. This system is linked to developing and managing content, integrating the curriculum and providing technical and pedagogical support to schools for integrating ICT into education.

The policy proposes 12 program areas, and the implementation plan identifies seven priority objectives for delivery over the five years (2010–2015). The latter includes expanding the ICT infrastructure to improve access and equity, developing capacity to integrate ICT in education practice, developing quality digital content and establishing open and distance eLearning.

A salient feature of both the policy and the implementation plan is the commitment to integrate monitoring and evaluation in the policy's conceptualisation and implementation. This includes the development of a comprehensive monitoring and evaluation framework, which is currently underway.

There remains sober awareness within the government that the process of implementing the policy will be fraught with systemic challenges, such as infrastructure-readiness, resource and capacity constraints at both Ministry and school levels. The integration of monitoring and evaluation is considered crucial to ensure that the process works within these challenges, imbued with a culture of continuous stakeholder learning.

The draft ICT for Education Policy also proposes that ICT-enabled training methods be explored, including distance education, eLearning and blended learning, and that training will be offered continuously to enable teachers to keep abreast of technological and pedagogical developments (Isaacs, 2011).

⁶² http://www.minecofin.gov.rw/fileadmin/templates/documents/sector_strategic_plan/ICT_SSP_SMART_Rwanda_Master_Plan_.pdf

⁶³ http://www.mineduc.gov.rw/fileadmin/user_upload/Education_Sector_Strategic_Plan_2013_-_2018.pdf

⁶⁴ http://www.mineduc.gov.rw/fileadmin/user_upload/ICT_in_Education_Policy_draft1-2_01.pdf

ICT Access and Use

The World Economic Forum (2015e) scores Rwanda 4.3 on a scale of 1 to 7 in terms of Internet access in schools. The ITU (2014) published the following ICT access data for 2013, reflecting low levels of access.

Table 16: ICT Access in Rwanda

Fixed telephone subscriptions per 100 inhabitants	0.4
Mobile cellular telephone subscriptions per 100 inhabitants	56.8
Mobile broadband subscriptions per 100 inhabitants	5.8
Households with a computer	2.9%
Households with Internet access at home	2.9%
Individuals using the Internet	8.7%

Source: ITU (2014)

Currently, there are 10 Internet service providers, compared to two in 2002. Rwanda registered one of the highest Internet user growth rates in Africa, at 8,900 per cent, compared with the continent's growth rate of 2,450 per cent and the world's average rate of 444 per cent. In 2010, almost everyone in four public sector entities (ministries, agencies, provinces and districts) and about a third in the private sector had a web presence, according to the Rwanda Development Board. Based on their Network Readiness Index, the World Economic Forum (2015e) ranks Rwanda 83rd out of 143 countries in 2015.

Major Initiatives

National Initiatives

Innovation for Education

This programme has been initiated by the Rwandan Ministry of Education. It includes 26 Innovation for Education projects⁶⁵ that are aligned with the ESSP, each of which focuses on improving the quality of education and involves an array of partners. One of the projects is IWitness in Rwanda, which is a partnership between the Aegis Trust (a UK-based genocide prevention organisation), the Kigali Genocide Memorial Centre, and the University of Southern California's Shoah Foundation's Institute for Visual History and Education. The initiative focuses on engaging students cognitively and emotionally, and includes educational tools that inspire students to think critically and explore how they can contribute to Rwanda's social and economic development. The project also addresses the need for values in education in the general curriculum. It involves educator training workshops, in-classroom IWitness pilots, as well as information and demonstration sessions. Educators work with technologies in the classroom, develop new classroom management capacities, and develop the pedagogy and theory required for values education (Government of Rwanda, 2015a).

One Laptop Per Child Rwanda

The One Laptop Per Child project in Rwanda⁶⁶ ranks amongst the most ambitious programmes to promote access to digital technologies for children. It was launched in 2008 and focused on the distribution of laptops and tablets to primary schools. By 2015, an estimated 210,000 laptops had been distributed and teachers had been trained to use the laptops in the classroom. The Rwandan government aims to increase the total number of laptops distributed to 500,000 by 2017.

⁶⁵ <http://www.mineduc.gov.rw/innovation/spip.php?article424>

⁶⁶ http://wiki.laptop.org/go/OLPC_Rwanda

Institutional Initiatives

Kepler Kigali

Kepler⁶⁷ is a not-for-profit university programme that started in Rwanda in 2013. It runs online learning courses that are structured on a United States university-accredited, competency-based degree programme. Its tuition fees are USD 1,000 per annum. Students stream lectures and complete online assignments, problem sets and exams developed by leading professors on massive open online course (MOOC) platforms (Kepler Kigali, 2015).

Prospects and Challenges

Rwanda is one of Africa's ICT success stories in terms of expanding access to digital technologies for a substantial portion of its population. It has provided an enabling and supportive policy environment; it has also secured a wide range of partners in support of a number of flagship, large-scale programmes and has been able to roll out these programmes with some degree of success. Rwanda is also home to a growing number of new, innovative initiatives.

However, Rwanda remains constrained by limited human resource capacity within the government and evidently has some way to go to reach the goals of Vision 2020.

⁶⁷ <http://kepler.org>

Seychelles

Introduction and Background

Seychelles is an archipelago of about 115 islands and has a small population of 100,000. The UNDP (2014n) classifies it as a high human development country, with a per capita gross national income in 2013 of USD 24,632, making it one of Africa's six upper-middle-income economies. The country is now ranked second in the Human Development Index in the African region, having been overtaken by Mauritius in 2014. Since Seychelles achieved independence in 1976, it has developed from being a predominantly agrarian economy to one based on tourism and fisheries (Government of Seychelles, 2012). Whilst the country has surpassed Millennium Development Goal 2, the provision of universal primary education, with a net enrolment ratio in primary education of 101.3 in 2012 and a primary completion rate of 125 per cent in 2011 (Government of Seychelles, 2013), there are concerns about the quality of education and the pass rates at secondary and tertiary levels (Mpande & Kannan, 2015).

Table 27: Basic Data about Seychelles

Indicators	
Population (2013)	0.1 million
Languages	Creole, English, French
Economic activity	Tourism, fisheries
Human Development Index (2013)	0.756 (71 st out of 187 countries and territories)
Per capita gross national income (2013)	USD 24,632
Life expectancy (2013)	73.2
Mean years of schooling (2013)	9.4

Sources: Commonwealth Secretariat (2015), UNDP (2014n)

National Policies, Strategies and Programmes

Policies and laws in education are guided by the Constitution of the Republic of Seychelles, which was enacted in 1993 and amended in 1996. The Constitution stipulates that every citizen has the right to education, and it undertakes to: provide free, compulsory education in state schools for a minimum of 10 years; ensure that the educational programmes in all schools aim at the complete development of the person; afford every citizen equal access to education opportunities beyond the period of compulsory education; allow the establishment and maintenance of private schools; and respect the right of parents to choose whether to send their children to state or private schools (Government of Seychelles, 1996).

National Policies and Strategies Related to TEL

In September 2014, the Ministry of Education adopted a Medium-Term Strategic Plan⁶⁸ (2013–2017). The aim of this strategy is to transform the education system. This involves a review of the entire education curriculum and all education policies. The plan has five objectives: providing for the diversity of educational needs and national development priorities; improving the quality of teachers; guaranteeing quality education in schools; improving institutional governance; and creating responsible and empowered students. Along with these changes, the Ministry is also involved in reviewing its early childhood framework, reviewing vocational and technical training, and ensuring teaching and learning are supported by ICT (Mpande & Kannan, 2015).

The Government of Seychelles also adopted a National ICT Policy⁶⁹ in 2007, whose stated vision is to make Seychelles globally competitive, with a modern, ICT-enabled economy and a knowledge-based information society in which strong, efficient and sustainable improvements in social, economic, cultural, governance and regional-integration sectors are achieved through the deployment and effective application of ICT.

One of its policy objectives is to use ICT to enhance education and skills development and build a growing ICT-savvy nation. It also states that it will: (i) promote and support the development of qualified

⁶⁸ http://planipolis.iiep.unesco.org/upload/Seychelles/Seychelles_Education_Sector_Medium_Term_Strategic_Plan_2013-2017.pdf

⁶⁹ <http://www.ict.gov.sc/resources/policy.pdf>

personnel in ICT in a sustainable manner to meet labour market needs; (ii) develop the teaching of ICT at all levels of the formal education system; (iii) promote the use of ICT in the informal education sector; (iv) encourage activities relating to lifelong learning through the use of ICT; (v) encourage the use of ICT by all educational, scientific and research institutions, libraries, archives, museums and community centres; (vi) develop programs to attract and retain skilled ICT professionals in the economy; and (vii) ensure opportunities for all learners to acquire ICT skills and be able to use them confidently and creatively to access employment or further training (Government of Seychelles, 2007).

ICT Access and Use

The World Economic Forum (2015e) scores Seychelles 4.2 on a scale of 1 to 7 in terms of Internet access in schools. The ITU (2013) published the following ICT access data for 2013, reflecting high levels of access.

Table 28: ICT Access in Seychelles

Fixed telephone subscriptions per 100 inhabitants	23.4
Mobile cellular telephone subscriptions per 100 inhabitants	147.3
Mobile broadband subscriptions per 100 inhabitants	9.9
Households with a computer	59.3%
Households with Internet access at home	50.6%
Individuals using the Internet	50.4%

Sources: ITU (2013), WEF (2015e)

Based on their Network Readiness Index, the World Economic Forum (2015e) ranks Seychelles 74th out of 143 countries in 2015.

Major Initiatives

National Initiatives

According to the Ministry of Education website, it is implementing its Masterplan for IT in Education and preparing to enhance the role of audiovisual and multimedia technologies in education. It also states that it has a number of technology-related projects under way.

Centre of Excellence in ICT

Based on a visit to Mauritius and India by the President of Seychelles, a partnership between India and Seychelles developed which involves the Government of India setting up a Centre of Excellence for teaching IT in Seychelles.⁷⁰ It will have a state-of-the-art training facility, a video conference facility, a distance education programme, a data centre, and an IT centre and virtual reality lab. The need has been articulated to have at least two Community Information Centres (CICs), one each on the islands of Praslin and La-Digue, respectively, to which the Centre of Excellence will connect. It will also have a video conferencing, distance education and general awareness program (Centre for the Development of Advanced Computing, 2015).

Institutional Initiatives

University of the Seychelles (Unisey)

Unisey is Seychelles's only university. It was established in 2009 and to date has had 300 students and 12 degree programmes. The university is also a Microsoft IT Academy Centre; membership in this programme enables academic institutions to deliver training in Microsoft IT professional, IT developer and Office technologies to their students, as well as to offer their educators resources on the latest Microsoft technologies.

⁷⁰ <http://cdac.in/index.aspx?id=project5>

Prospects and Challenges

As a small island state, Seychelles has made some strides in TEL in recent years. The opening of the Seychelles University in 2009, with a well-established ICT infrastructure, is a significant boost to the country's education system. However, there has been limited investment in promoting the use of digital technologies in schools and at the polytechnic, even though the ICT policy makes reference to the need to invest in technologies across the education system. Seychelles is also constrained by limited human resource capacity and expertise in TEL. The country's ICT infrastructure is strong, however, relative to many African countries, with higher levels of access in households, which bodes well for TEL.

Sierra Leone

Introduction and Background

Sierra Leone is a small country on the west coast of Africa. Its Human Development Index value for 2013 was 0.374, putting it in the low human development category and positioning the country at 183 out of 187 countries and territories, according to the UNDP (2014o). In 2013, its life expectancy at birth was 45.6 years and its gross national income per capita was USD 1,815. Sierra Leone was also one of the countries hardest hit by the Ebola epidemic, with more than 3,800 having died since the outbreak began in 2014.

Table 29: Basic Data about Sierra Leone

Indicators	
Population (2011)	6 million
Language	English
Human Development Index (2013)	0.374 (183 rd out of 187 countries and territories)
Gender Inequality Index (2013)	0.643 (139 th out of 149 countries)
Per capita gross national income (2013)	USD 1,815
Life expectancy (2013)	45.6
Mean years of schooling (2013)	2.9

Sources: Commonwealth Secretariat (2015), UNDP (2014o)

National Policies, Strategies and Programmes

National Economic Frameworks

The Government of Sierra Leone developed a national vision and framework for economic growth and development, called Sierra Leone Vision 2025. The vision includes a long-term goal of improving education and skills development and makes some reference to the value of ICT.

National Policies and Strategies Related to TEL

In 2009, the government adopted a National ICT Policy,⁷¹ which refers to meeting education objectives. The education-related policy objectives are to enhance education access, quality, training and research through the use of ICT. The strategies to reach this objective include:

- providing training for teachers and health professionals in ICT use;
- promoting new and innovative forms of teaching and learning (eLearning, telemedicine);
- promoting high-capacity, reliable and cheap connections for all schools, universities and research institutions;
- providing support to ICT research and development as well as monitoring scientific and technological evolution; and
- promoting the training of women, persons with disabilities and vulnerable groups in aptitudes, skills and competencies that will enable them to take advantage of a knowledge-based economy and society (Government of Sierra Leone, 2009).

ICT Access and Use

Data on ICT access in education in Sierra Leone are not readily available. However the ITU (2014) published the following ICT access data for 2013, reflecting very low levels of access.

⁷¹ <http://mofed.gov.sl/PUBLICATIONS/NationalICTPolicy.pdf>

Table 30: ICT Access in Sierra Leone

Fixed telephone subscriptions per 100 inhabitants	0.3
Mobile cellular telephone subscriptions per 100 inhabitants	44.1
Households with a computer	0.8%
Individuals using the Internet	1.7%

Source: ITU (2014)

Major Priorities and Initiatives

National Initiatives

Government of Sierra Leone Interactive Virtual Education

The government commissioned Internet service provider Sierra WiFi to install educational portals in schools across the country, to help students and teachers access course tools online. The initiative is called Government of Sierra Leone Interactive Virtual Education⁷² (GiVE). It uses technology for effective delivery of government-approved content via the GiVE portal, a Wi-Fi enabled file server loaded with educational resources. The portal provides easy access to a controlled intranet and interactive educational tools for students and teachers at the primary, junior secondary and senior secondary school levels.

Institutional Initiatives

Lamtech Consulting

This is a private company that helps students and teachers in Sierra Leone schools gain access to free and open learning materials that are available online. It also supports the establishment of solar-powered classrooms and works with universities to develop educational websites.

Prospects and Challenges

Sierra Leone has been severely affected by the recent Ebola crisis in Africa, which laid the basis for a few ICT-enabled support interventions to tackle the effects of the disease. These include the development of mobile apps to disseminate relevant information in local languages and raise awareness about the disease.

Despite the Ebola crisis setback, the government has recognised the value of continued investment in innovation through ICT. They have a few projects underway at schools, despite being constrained by the limited infrastructure and lack of human resource capacity. However, the country has a number of NGOs who work with schools and communities, and presently the country relies strongly on donor support for its ongoing social and economic development.

⁷² <http://www.sierrawifi.com>

South Africa

Introduction and Background

South Africa has a long history of innovation in education. Its early experiences date back to the 1980s, when NGOs were involved in promoting community radio as well as access to PCs to historically black schools as part of a generalised resistance to the Apartheid education system. With the birth of South Africa's democracy in 1994, a new legislative and policy environment laid the foundation for education system transformation.

Of the 53.5 million people in South Africa, 62 per cent live in urban areas. The country falls into the medium human development category according to the UNDP (2014p), which places South Africa at 118th out of 187 countries in terms of the Human Development Index. South Africa ranks 139th out of 143 countries in terms of the quality of its education system (WEF, 2015n). In 2013, it had a secondary education attainment rate of 64.3 per cent and a tertiary attainment rate of 13.7 per cent for its 25 to 54 age group (WEF, 2015n). South Africa has a medium level of gender inequality, based on the UNDP's Gender Inequality Index (UNDP, 2014p).

Table 31: Basic Data about South Africa

Indicators	
Population (2013)	53.5 million
Languages	Afrikaans, English, Ndebele, Sesotho, Sesotho sa Leboa (Northern Sotho), Setswana, siSwati, Tsonga, Venda, Xhosa and Zulu
Economic activity	Mining, agriculture, chemicals, energy, financial services, information technology, manufacturing, telecommunications
Human Development Index (2013)	0.658 (118 th out of 187 countries and territories)
Gender Inequality Index (2013)	0.461 (94 th out of 149 countries)
Per capita gross national income (2013)	USD 11,788
Life expectancy (2013)	56.9
Mean years of schooling (2013)	9.9
Tertiary educated population	3,858,000

Sources: Commonwealth Secretariat (2015), UNDP (2014p), WEF (2015n)

Policies, Strategies and Programmes

Education and skills development policies and laws are governed ultimately by the Constitution of South Africa, which was formally legislated as an act in 1996. The Constitution promotes the values of human dignity, equality, rights and freedoms, non-racism and non-sexism. It prescribes the right to basic education for everyone, including adult basic education.

National Vision and Economic Frameworks

Since 1994, a number of successive national economic and growth plans have been adopted to give expression to the ideals of the Constitution. The most recent National Development Plan⁷³ (NDP) aims to eliminate poverty and reduce inequality by 2030. It envisages a seamless information infrastructure by 2030 that will underpin a dynamic, connected, vibrant information society and knowledge economy that are inclusive, equitable and prosperous. It identifies a number of interrelated core elements that define a decent standard of living, and it highlights quality education and skills development as one such core element. The NDP also recognises the potential of science and technology to improve lives and identifies ICT as a critical enabler that can provide opportunities for manufacturing, service provision and job creation.

⁷³ <http://www.gov.za/issues/national-development-plan-2030>

National Policies and Strategies Related to TEL

The legal landscape that governs ICT in education in schools, universities and colleges involves a fluid and complex web of laws and policies that cover, inter alia, the education, broadcast, ICT infrastructure, library, media and publishing sectors.

Two key education laws are the National Education Policy Act⁷⁴ (1996), which legislates on matters related to the governance of the national education system for the provision of basic education, and the South African Schools Act⁷⁵ (1996), which ensures that all learners have the right to access quality education without discrimination.

Within the ICT infrastructure space, the Electronic Communications Act (2005),⁷⁶ which was amended in 2014, makes legislative and regulatory provisions for access to broadband infrastructure in schools through the establishment of the e-Rate within its Universal Service and Access Obligations (USAO) Framework and the Universal Service and Access Fund (USAF). The e-Rate is a 50 per cent discounted rate for the provision of Internet services to schools.

The policy mandate of the South African government related to education includes the e-Education White Paper⁷⁷ (2004), which focuses on the use of ICT to accelerate the achievement of national education goals. It highlights the importance of connecting learners and teachers to each other and to professional support services and provides for the establishment of platforms for eLearning. It also seeks to connect learners and teachers to better information and ideas via an effective combination of pedagogy and technology in support of education reform.

The primary goal of the White Paper was to equip every basic and further education and training learner with the knowledge and skills needed to use ICT confidently, creatively and responsibly by 2013. This goal was supported by a strong policy framework consisting of four components: equity; access to ICT infrastructure; capacity building; and norms and standards.

The paper highlights the need to equitably allocate resources and to prioritise schools in rural and underserved communities to ensure that technology use in the education sector does not further exacerbate the country's digital divide. It also includes ICT professional development for management, teaching and learning; electronic content-resource development and distribution; access to ICT infrastructure; connectivity; community engagement; and research and development (Department of Education, 2004).

The South African government also adopted a White Paper on Post-School Education and Training⁷⁸ in 2013, which covers all education and training provisions for those who have completed school, those who have not and those who have never attended school. The policy highlights the need for equitable access to appropriate technology. It recognises that ICT is indispensable for effective education provision and central to open learning. It suggests plans to improve ICT access and calls for teaching and learning interventions using ICT to be carefully planned and implemented. The policy also commits to promoting open learning and supporting the development and use of open learning resources.

It states further that the Department of Higher Education and Training will support the production and sharing of OER in the post-school sector and will develop an appropriate open licensing framework for use by all education stakeholders within an overarching policy framework on intellectual property rights and copyright in the post-school sector. Furthermore, it encourages the adoption and use of open source software as well as the purchasing of shared software licences.

In the ICT space, a more recent National Integrated ICT Policy Green Paper⁷⁹ (2014) has been adopted, which will give way to a more formal policy on ICT.

⁷⁴ <http://www.education.gov.za/LinkClick.aspx?fileticket=I73mPb%2Fja4c%3D&tabid=185&mid=1828>

⁷⁵ <http://www.education.gov.za/LinkClick.aspx?fileticket=LK2dmusQOjs%3D&tabid=188&mid=498>

⁷⁶ <http://wiki.lib.sun.ac.za/images/c/c7/Doc-bb-policy.pdf>

⁷⁷ <https://www.westerncape.gov.za/legislation/white-paper-e-education>

⁷⁸ <http://www.dhet.gov.za/SiteAssets/Latest%20News/White%20paper%20for%20post-school%20education%20and%20training.pdf>

⁷⁹ <http://www.ellipsis.co.za/wp-content/uploads/2014/01/Gazetted-2014-National-Integrated-ICT-Policy-Green-Paper.pdf>

In 2013, a National Broadband Policy⁸⁰ (also referred to as SA Connect) sets clear targets for broadband access for schools. It states that by 2016, 50 per cent of public schools should have access to broadband at 10Mbps, increasing to 100 per cent by 2020.

To realise the objectives and goals outlined in government policies, each government department has developed action plans. The action plan of the Department of Basic Education (DBE) to 2019⁸¹ sets out 32 education goals and how these are to be achieved. Here, the explicit reference to ICT assumes a focus on ICT literacy for teachers. The plan's goal 16 is to improve the professionalism, teaching skills, subject knowledge and computer literacy of teachers throughout their entire careers. It also references e-education in goal 27: "Improve the frequency and quality of the monitoring and support services provided to schools by district offices, partly through better use of e-Education."

ICT Access and Use

In 2014, South Africa had 12,655,436 learners in ordinary public and independent schools who attended 25,741 schools and were served by 425,090 educators (Government of South Africa, 2014).

Based on the information available in the DBE's National Education Infrastructure Management System Report (Government of South Africa, 2011a), of the 24,793 public ordinary schools at that time:

- 3,544 schools did not have electricity, whilst a further 804 schools had an unreliable electricity source;
- 2,402 schools had no water supply, whilst a further 2,611 schools had an unreliable water supply;
- 913 did not have any ablution facilities, whilst 11,450 schools were still using pit latrine toilets;
- 22,938 schools did not have stocked libraries, whilst 19,541 did not even have space for a library;
- 21,021 schools did not have any laboratory facilities, whilst 1,231 schools had stocked laboratories;
- 2,703 schools had no fencing; and
- 19,037 schools did not have a computer centre, whilst a further 3,267 had a room designed as a computer centre but were not stocked with computers.

A recent study by Via Afrika (Sapa, 2014) revealed that although more than 80 per cent of South African schools have the infrastructure to roll out digital learning, most teachers are not equipped to use it. It also found that in 2011: an estimated 130,000 teachers had been trained in basic computer skills and software devices (this number excludes the training of teachers by private providers); five provinces had more than 90 per cent of their schools electrified, but two of the nine provinces were lagging behind; and more than 20 per cent of the schools had no power supply.

Evidently there is not a single definitive source of reliable information on ICT access and use in South Africa's education institutions. However, taken as a whole, the above-mentioned information reflects a generalised lack of reliable, consistent access to ICT for the majority of schools, which militates against their use in support of quality learning and teaching.

⁸⁰ http://www.gov.za/sites/www.gov.za/files/33377_617.pdf

⁸¹ <http://www.education.gov.za/LinkClick.aspx?fileticket=HHmKn78Z7Q%3D&tabid=75&mid=1167>

Table 32: ICT Access in South Africa

Fixed telephone subscriptions per 100 inhabitants	8.6
Mobile cellular telephone subscriptions per 100 inhabitants	160.6
Mobile broadband subscriptions per 100 inhabitants	74.1
Households with a computer	13.5%
Households with Internet access at home	10.6%
Individuals using the Internet	15%
Use of virtual networks	5.4%

Sources: ITU (2014), WEF (2015n)

The WEF (2015n) scores South Africa 3.4 on a scale of 1 to 7 in terms of Internet access in schools. Based on their Network Readiness Index, the WEF (2015n) ranks South Africa 75th out of 143 countries in 2015.

Major Priorities and Initiatives

National Initiatives

At the time of writing in May 2015, the following ranked amongst the key national programmes led by the DBE, the Department of Communications and their partners.

Operation Phakisa ICT in Education Lab

Operation Phakisa is a presidential initiative launched by the South African government in late 2014, designed to fast-track the implementation of critical development areas identified in the NDP. The methodology draws on the Malaysian experience of delivering big, fast results over a short period of time. ICT and its use in education is one such critical area of focus scheduled to take place in June–July 2015. Based on technical facilitation and collaboration with the World Bank and the Government Technical Advisory Centre, in the Treasury, the lab will bring together approximately 250 ICT in education stakeholders for six intensive weeks to produce a systematic and detailed roll-out plan for the delivery of curriculum through ICT infrastructure to all schools across the nine provinces of South Africa.

The lab focuses on four main strategic objectives: (i) electronic content resource development and distribution, (ii) ICT professional development for management, teaching and learning, (iii) access to ICT infrastructure and (iv) connectivity (Government of South Africa, 2015a).

ICT Resources for Teacher Centres

The DBE’s Integrated Strategic Planning Framework for Teacher Education and Development calls for the establishment and strengthening of provincial teacher development institutes and district teacher development centres. Together these are broadly referred to as teacher centres. As part of a strategy to build functional teacher centres, the DBE has partnered with the private sector and other institutions to provide ICT resources to all teacher centres (Government of South Africa, 2015b).

SA Connect: Broadband Access to Schools

The South African government has launched its SA Connect initiative, as spelled out in its Broadband Policy. As South Africa’s response to the Broadband Commission established by the ITU and UNESCO in 2010, SA Connect is a plan to expand access to broadband. The target is to reach 4,400 schools, 580 clinics and 572 other government buildings in 2015 and to connect 50 per cent of schools by 2016 (htxt.africa, 2014). However at the time of writing, there have been challenges in reaching the planned targets (Rawlins & Mawson, 2015).

Ukufunda Virtual School

The DBE in partnership with UNICEF and the Reach Trust developed a portal of education resources that are accessible on mobile phones, called the Ukufunda Virtual School, or “school in your pocket.” Ukufunda makes available learning resources and content, counselling and safety services, a central communication and notification hub and many other value-added services and programmes targeted at parents, teachers and learners in South Africa.

DBE Television Channel

A dedicated DBE education television broadcasting channel has been established by the DBE in partnership with the private company Platco Digital. Programmes are broadcast on two satellite channels: the Open View Higher Definition (OVHD) channel (201) and the DSTV channel (319). By May 2015, 700 schools had received OVHD satellite dishes and decoders to access the channel. It offers broadcast lessons in a number of key subjects for Grades 10–12.

South African National Research and Education Network (SANREN)

At a tertiary level, perhaps the most significant national intervention to date is the establishment of SANREN, a large-scale government infrastructure project that provides network connectivity between all public higher education institutions and research organisations. It is also connected to the Square Kilometre Array site in the Northern Cape and has enabled South African researchers to participate meaningfully in global scientific experiments (MyBroadband, 2012).

Provincial Initiatives

Each of South Africa's nine provincial education departments are involved to varying degrees with creating opportunities for quality learning and teaching via digital technologies in schools. The following are noteworthy.

The Internet Broadcast Project (IBP) in the Free State

The IBP is one of the Free State Department of Education's most successful education projects. On a weekly basis, subject experts broadcast live lessons via Mediasite from a studio on the campus of the University of the Free State to 70 schools across the province. Each participating school is equipped with unlimited Internet access and a device called the iBox (which combines a portable computer, a data projector and a sound system). The project involves 54,000 learners and 3,000 teachers, mainly from rural areas, and has reportedly improved learners' performance, especially in their Grade 12 final exams (Sonic Foundry, 2014).

Gauteng Paperless Classrooms

During 2015, the Gauteng Department of Education launched its paperless classrooms initiative, which involves the extensive use of digital technologies, including tablets that are connected to a server through broadband, Wi-Fi and 4G connections, to support learning and teaching. The project initially involved seven pilot schools during 2015, supported by private sector partners. The plan is to roll out the initiative to all schools in the province over the next five years, which will cost an estimated USD 1.7 billion. The project focuses on raising the standard of learning to international levels and hopes to reach all learners, especially in poorer schools in the province, by the 2017–2018 financial years (Magubane, 2015).

Western Cape Education Department's Smart Classrooms and eLearning Project

The WCED also announced a strategy in February 2015 that will involve: linking all schools through a high-speed, real-time wide area network (WAN); the provision of local area networks (LANs); a Smart Schools Project, which will involve refreshing existing PC labs in schools and providing new labs and smart classrooms; developing and expanding online digital resources; training teachers in ICT and the use of eLearning in schools; and developing partnerships with the private sector and donor community (Southafrica.info, 2015).

Institutional Initiatives

Jaffer, Ng'ambi and Czerniewicz (2007) and SAIDE (2007) have provided an overview of the status of ICT in higher education. Both make reference to a range of public universities in South Africa that have developed student registration systems, eLearning courses as well as online blended learning programmes.

A more recent trend is the extension of their offering to include MOOCs. Wits University announced recently that it signed up with Harvard University and MIT to offer the edX free MOOCs to students in Africa and around the world. Similarly, the University of Cape Town is also offering MOOCs, some of which it has developed, and it has adopted an institutional policy on OER.

OER Africa

SAIDE established the OER Africa Project,⁸² which is currently based in Nairobi, Kenya. OER Africa works with higher education institutions across Africa to support the development and use of OER. It also serves to foster collaboration between higher education institutions and academics in the development of OER and in research on OER in Africa. As well, it focuses on providing institutional support to higher education institutions to develop OER policies. OER Africa has also established an OER repository, which contains a range of courses that have also been produced by African higher education institutions.

OER@UNISA

The University of South Africa is one of Africa's largest universities, with more than 300,000 learners. It has embraced OER, including by conducting research and adopting policies and strategies in support of OER. In 2011, it adopted an ICT-enhanced Teaching and Learning Strategy 2011–2015,⁸³ and in 2014, it adopted an OER Strategy⁸⁴ for 2014–2016. The guiding principles of the OER Strategy include: Africanisation; a commitment to openness; and excellence, integrity and relevance (UNISA, 2014).

UNISA also has a repository in the form of OpenCourseware and learning objects,⁸⁵ which hosts OER produced and shared by UNISA and its colleges.

University of Cape Town (UCT)

UCT established an Open UCT project from 2011 to 2014 with the support of the Andrew Mellon Foundation. This project involved advocacy on open access and open education issues within the university and in higher education by hosting events and engaging in policy development. The project also undertook research and supported the UCT community on matters relating to open licensing and open access.

The project launched the OpenUCT Repository⁸⁶ in collaboration with UCT Libraries, the Centre for Innovation in Learning and Teaching, and Information and Communication Technology Services.⁸⁷ It serves as an open access platform for UCT staff to share their research, teaching and learning content with the world. The repository contains over 7,500 resources across all the UCT faculties, with the top resource (interestingly, an OER) having been downloaded over 70,000 times (Open UCT, 2015). UCT also adopted an open access policy⁸⁸ in March 2014 that proposes open scholarship and open education in its commitment to scholarly communication, e-research and the stewardship of digital content (UCT, 2014).

Prospects and Challenges

ICT in education in South Africa demonstrates dynamic growth, with renewed government and private sector investments at national and provincial levels. This raises the prospect of expanded access to ICT resources in schools, colleges and universities across the country.

High levels of mobile penetration in South Africa at a consumer level also promise to expand access to digital resources via mobile subscriptions to remote areas.

ICT adoption in private education institutions seems to be on the rise, and there are claims that it is improving learning outcomes and learner performance. This is a trend worthy of closer scrutiny.

One of the key challenges in the effective integration of ICT in the education system relates to challenges with the national policy environment. A 2012 report by the Bridge highlighted the view that there has been a lack of policy direction and clear implementation strategy, which has led to fragmented and uncoordinated practice.

⁸² <http://www.oerafrica.org>

⁸³ <http://www.unisa.ac.za/contents/unisaopen/docs/ICT-enhanced%20teaching%20and%20learning%20strategy%202011-2015.pdf>

⁸⁴ <http://www.unisa.ac.za/contents/unisaopen/docs/OER-Strategy-March-2014.pdf>

⁸⁵ <http://www.unisa.ac.za/Default.asp?Cmd=ViewContent&ContentID=27967>

⁸⁶ <https://open.uct.ac.za>

⁸⁷ <http://www.icts.uct.ac.za>

⁸⁸ <https://www.uct.ac.za/downloads/uct.ac.za/about/policies/UCTOpenAccessPolicy.pdf>

There is also considerable debate about paradigmatic shifts in learning and teaching that are influenced by rapidly changing technologies. Existing policies have not considered these educational possibilities and their implications for prevailing education paradigms. The DBE Action Plan to 2019 recognises the limitations of existing policy and has indicated a need for policy review and the development of a national strategy.

One of the major challenges of ICT in education programmes is that conversations do not focus enough on the contexts and experiences of learners and teachers and how they learn and teach with technologies.

Another important challenge is that where teachers have access to training, they have mainly been trained in ICT skills and digital literacy and less on ways to enhance learning in ways that accommodate individual and varied learning styles. A study by Ndlovu and Lawrence (2012) revealed that teachers in South African schools are still in the phase of using ICTs merely to transmit subject content rather than to enhance learning.

Swaziland

Introduction and Background

Swaziland is a small, landlocked country governed by an absolute monarchy, which means that King Mswati II has ultimate authority over the cabinet, legislature and judiciary. It has a population of 1.1 million people, 63 per cent of whom are estimated to live below the poverty line, despite Swaziland's status as a lower middle-income country. Swaziland has one of the most unequal income distributions and one of the highest HIV prevalence rates in the world. Life expectancy is 49 years, and the country has a high number of orphaned and vulnerable children.

Twenty-one per cent of the population lives in urban areas. The country falls into the low human development category and has a high level of gender inequality, based on the UNDP's Gender Inequality Index (UNDP, 2014q).

Table 33: Basic Data about Swaziland

Indicators	
Population (2013)	1.1 million
Languages	siSwati, English
Economic activity	Manufacturing
Human Development Index (2013)	0.530 (148 th out of 187 countries and territories)
Gender Inequality Index (2013)	0.529 (115 th out of 149 countries)
Per capita gross national income (2013)	USD 5,536
Life expectancy (2013)	49
Mean years of schooling (2013)	7.1

Sources: Commonwealth Secretariat (2015), UNDP (2014q).

Policies and Laws

Policies and laws in education are guided by the Constitution, which was enacted in 2005. The Constitution provides for the right to free education in public schools up to at least the end of primary school (Government of Swaziland, 2005).

National Vision and Economic Frameworks

The Swazi government adopted a national economic strategy called the National Development Strategy – Vision 2022⁸⁹ in 1997, which envisages that by 2022, Swaziland will be in the top 10 per cent of the medium human development group of countries, founded on sustainable economic development, social justice and political stability. The strategy's vision statement also places the focus on quality of life, the critical dimensions of which are poverty eradication, employment creation, gender equity, social integration and environmental protection, which are in turn linked to education, health and other aspects of human resource development. Important elements in this strategy are appropriate education and training, including a shift towards a technical and vocational orientation (Isaacs, 2007i). The Swaziland government has historically been guided by its Education Act of 1981.

National Policies and Strategies Related to TEL

Whilst Swaziland does not have an explicit national policy on ICT in education, it adopted an Education and Training Sector Policy⁹⁰ in 2011, which has extensive references to investment in ICT and its integration into the education and training system. Some of the policy commitments related to ICT include that the government will:

- ensure that every secondary school has at least one qualified mathematics, science and ICT teacher in service by 2015 to improve the teaching of these subjects;
- develop and offer ICT as a primary and secondary school programme;

⁸⁹ <http://www.tralac.org/files/2012/12/The-National-Development-Strategy.pdf>

⁹⁰ <http://planipolis.iiep.unesco.org/upload/Swaziland/SwazilandEducationSectorPolicy2011.pdf>

- develop and impart research skills linked to the world of work and entrepreneurial development, including the use of ICT in the medium term;
- ensure the use of ICT in open and distance learning and course delivery in the medium term;
- recognise there is a shortage of ICT teachers and be open to importing ICT teachers; and
- integrate ICT in the secondary school curriculum in the long term.

The policy extensively references gender equality and mainstreaming (Government of Swaziland, 2011).

The Government of Swaziland also adopted a National Information and Communication Infrastructure Policy⁹¹ in 2006, which is now being revised. The policy makes reference to the value that ICT can add to the delivery of quality education in Swaziland, and it proposes the following policies related to education:

- the development of national human resource capacity to enable the exploitation of ICTs within society to support the delivery of educational services at all levels, health services and social services, whilst improving operations, efficiency and service delivery in the civil and public services;
- providing universal access to information for all citizens to improve the quality of life through inclusive access to education, science and technology, health, culture and entertainment;
- ensuring that ICT is utilised to address inequalities in education, employment opportunities and decision-making for women and other disadvantaged groups, including ICT capacity building for girls and women (Government of Swaziland, 2006).

The strategies that the policy puts forward include the improvement of human resource development through identified capacity-building initiatives to meet national development demands and requirements, and the deployment of ICT to address the need for equitable access to education and training. It also proposes:

- enhancing capacity building and ICT awareness for all (teachers, civil servants, the public);
- integrating ICT into mainstream educational curricula and other literacy programmes; and
- deploying infrastructure that addresses the ICT requirements of the different sectors, including education (Government of Swaziland, 2006).

ICT Access and Use

Data on ICT access in education in Swaziland are not readily available. However, the World Bank (2014) published the following ICT access data for 2012, reflecting low levels of access.

Table 34: ICT Access in Swaziland

Fixed telephone subscriptions per 100 inhabitants	3.7
Mobile cellular telephone subscriptions per 100 inhabitants	65.4
Fixed broadband subscriptions per 100 inhabitants	0.3
Households with a computer	11.9%
Households with Internet access at home	11.4%
Individuals using the Internet	20.8%

Source: World Bank (2014)

⁹¹ <http://www.sptc.co.sz/regulator/SwazilandPolicyRev1-June2006.pdf>

According to the Ministry of Education and Training's website, 155 schools in Swaziland have access to computers. This includes 75 per cent of all secondary schools. In addition, an ICT senior inspector post has been created in the Ministry of Education and Training (Government of Swaziland, 2015). Madzima, Dube and Mashwama (2013) stated that at that time, all 230 secondary schools in Swaziland had access to electricity.

Based on the World Economic Forum's Network Readiness Index, Swaziland ranks 125th out of 143 countries in 2015 (WEF, 2015e).

Major Priorities and Initiatives

National Initiatives

Partnership with the Japan International Cooperation Agency (JICA)

According to Madzima et al. (2013), the Swaziland Ministry of Education has entered into partnerships with JICA to establish an ICT staffing policy, curriculum development with ICT, and resource allocation. This process involves implementing a dedicated programme for training teachers in the use of ICT.

According to the National ICT Policy, the Ministry of Education has also partnered with UNESCO and JICA in the development of an ICT curriculum at lower levels of education (Government of Swaziland, 2006).

Institutional Initiatives

The Swaziland Computer Society

The Swaziland Computer Society was established in 2010 in an effort to facilitate communication between ICT professionals, ICT instructors and ICT enthusiasts throughout the country.

In 2011, the Swaziland Computer Society⁹² was involved in distributing to schools DVDs that contained 5,500 educational articles and 34,000 images downloaded from Wikipedia. The DVDs were produced in a partnership between the Wikimedia Foundation and SOS Children's Village UK.

Since 2011, they have been involved in distributing disks to schools, assisted by United States Peace Corp volunteers. These disks have been copied to 145 computers throughout Swaziland's schools. The Swaziland Computers Society included an autorun capability in the disks that they distributed, which reportedly contained an additional instruction page to make its use and function clearer to teachers (Swaziland Computer Society, 2015).

Swaziland College of Technology and University of Swaziland

The Swaziland government acknowledges the value that the Swaziland College of Technology adds to the pool of skills in the country through its Diploma in Computer Science. Similarly, the University of Swaziland is acknowledged for offering undergraduate degrees in computer science and electronic engineering.

Prospects and Challenges

The Swaziland government expresses clear commitment to promoting access to ICT in education institutions and to developing partnerships to realise its policy objectives. The national ICT policy is also very emphatic about the potential benefit that ICT can bring to the lives of women and girls and the importance of promoting gender balance in the design of ICT initiatives.

Whilst in recent years there has been some improvement in access to ICT, particularly in mobile subscriptions, Swaziland remains constrained by limited reliable Internet connectivity in education institutions. Swaziland tertiary institutions have begun to make online learning a possibility. However, few interventions have taken place in support of the production and distribution of OER, making this an area worthy of further exploration.

⁹² <http://www.swazitech.org/cms>

Tanzania

Introduction and Background

Tanzania is situated on the east coast of Africa and incorporates Zanzibar, which is a semi-autonomous part of the country with its own government. Tanzania is classified as a low human development country. Based on the Multi-Dimensional Poverty Index for 2013, 64 per cent of its population was living in poverty in mainland Tanzania and 31.3 per cent were living in extreme poverty. Tanzania's goal has been to reach a poverty level of 18 per cent by 2015 (UNDP, 2014r).

Tanzania ranks 109th out of 143 countries in terms of the quality of its education system (WEF, 2015o). In 2013, Tanzania had a secondary education attainment rate of 10.7 per cent and a tertiary education attainment rate of two per cent for its 25 to 54 age group (WEF, 2015o). Tanzania still has a high level of gender inequality, based on the UNDP's Gender Inequality Index (UNDP, 2014r).

Table 37: Basic Data about Tanzania

Indicators	
Population	52.3 million
Languages	Kiswahili, English
Economic activity	Natural gas, gold mining
Human Development Index (2013)	0.488 (159 th out of 187 countries)
Gender Inequality Index (2013)	0.553 (123 rd out of 149)
Per capita gross national income (2013)	USD 1,702
Life expectancy (2013)	61.5
Mean years of schooling (2013)	5.1
Tertiary educated population	478,000

Sources: Commonwealth Secretariat (2015), UNDP (2014r), WEF (2015o)

National Policies, Strategies and Programmes

Policies and laws in education are guided by the Constitution of the United Republic of Tanzania, which was ratified in 1977 and is currently subject to a referendum. The Constitution stipulates that every person has the right to education (Government of Tanzania, 1984).

National Vision and Economic Frameworks

The Tanzanian Government adopted National Vision 2025⁹³ in 1999, which envisages five main goals that the country will achieve by 2025: high-quality livelihoods; peace, stability and national unity; good governance; a well-educated and learning society imbued with an ambition to develop; and a competitive economy capable of producing sustainable growth and shared benefits. It also envisages Tanzania's evolution from being a least developed economy into a middle-income country, the elimination of abject poverty and the maintenance of an economic growth rate of eight per cent per annum. The Vision identifies the potential of ICT to address the country's development challenges.

In addition, the Revolutionary Government of Zanzibar formulated Zanzibar Vision 2020,⁹⁴ a plan for the long-term eradication of poverty and the attainment of sustainable human development. It also envisages the development of: a strong, diversified, competitive economy; peace; political stability; good governance; and national unity.

Accompanying its National Vision 2025 is the National Poverty Eradication Strategy. Since 2000, Tanzania has developed successive poverty reduction strategy papers,^{95, 96} which have included basic

⁹³ <http://www.tzonline.org/pdf/theTanzaniadevelopmentvision.pdf>

⁹⁴ http://planipolis.iiep.unesco.org/upload/Tanzania%20UR/Zanzibar/Zanzibar_Vision_2020.pdf

⁹⁵ <http://www.tzonline.org/pdf/FinalPRSP25.pdf>

education as a priority sector. Its latest strategy sets goals to ensure: equitable access to quality early childhood development programmes; primary and secondary education for girls and boys; the expansion of quality TVET; higher education; and adult non-formal and continuing education. The latest National Strategy for Growth and Reduction of Poverty II⁹⁷ (Government of Tanzania, 2011) again highlights goals and strategies for each education subsector and makes specific reference to equipping classrooms with ICT facilities and promoting the use of ICT in teaching and learning.

National Laws and Policies Related to TEL

The Government of Tanzania adopted an Education and Training Policy⁹⁸ in 1995 and an Education Sector Development Programme in 1997. The latter has been updated over time, with the latest being for 2008 to 2017.⁹⁹ Each education subsector (primary education, secondary education, TVET, teacher development and higher education) also has dedicated policies and programmes, which call for the inclusion of computer studies to expand the use of ICT so as to improve the quality of education.

The government also adopted a National ICT Policy¹⁰⁰ in 2003, which recognises that ICT can enhance education opportunities and advocates for the introduction of an e-education system.

In 2007, the government adopted an ICT Policy for Basic Education,¹⁰¹ which covers the education system from pre-primary to university, including secondary, teacher, non-formal and adult education.

The policy addresses a wide range of areas related to TEL and teaching, including ICT infrastructure, curriculum integration, digital content, teacher training, management, support and monitoring, and evaluation. Its definition of technologies includes the use of radios, mobile phones, computers and the Internet. It also highlights the importance of partnerships and stakeholder participation as a basis for resource provision, including finances.

The policy focuses on teacher education as a priority to be followed in primary, secondary and adult education, and in vocational institutions and libraries (Government of Tanzania, 2007; Swarts & Wachira, 2009).

ICT Access and Use

The World Economic Forum (2015e) scores Tanzania 2.85 on a scale of 1 to 7 in terms of Internet access in schools. The ITU (2014) published the following ICT access data for 2013, reflecting high levels of mobile access.

Table 38: ICT Access in Tanzania

Fixed telephone subscriptions per 100 inhabitants	0.3
Mobile cellular telephone subscriptions per 100 inhabitants	55.7
Mobile broadband subscriptions per 100 inhabitants	2.7
Households with a computer	3.4%
Households with Internet access at home	3.7%
Individuals using the Internet	4.4%

Source: ITU (2014)

⁹⁶ <http://www.imf.org/external/pubs/ft/scr/2006/cr06142.pdf>

⁹⁷ <http://www.imf.org/external/pubs/ft/scr/2011/cr1117.pdf>

⁹⁸ <http://www.tzonline.org/pdf/educationandtraining.pdf>

⁹⁹ <http://planipolis.iiep.unesco.org/upload/Tanzania%20UR/Tanzania-ESDP-2008-2017.pdf>

¹⁰⁰ <http://www.tzonline.org/pdf/ictpolicy2003.pdf>

¹⁰¹ http://planipolis.iiep.unesco.org/upload/Tanzania%20UR/Tanzania_ICT_Policy_for_BasicEducation_2007.pdf

Based on their Network Readiness Index, the World Economic Forum (2015e) ranks Tanzania 123rd out of 143 countries in 2015.

Major Initiatives

National Initiatives

TZ21: 21st-Century Basic Education Programme

To improve teaching and learning outcomes, school management and national capacity to drive Tanzania's educational goals, a national programme called TZ21^{inc} was established in partnership with international and national organisations, such as USAID and the Tanzanian Ministries of Education and Vocational Training, to implement a range of activities, some of which involve the integration of ICT. These include:

- focused technical assistance and professional support to primary school teachers, school administrators, students, school supervisors and education officers in the 900 project schools in Mtwara and Zanzibar;
- training for Standard One through Four teachers in child-centred, active-learning pedagogy, as well as assessment and feedback loops, classroom management and e-content incorporation;
- professional development for educators to enable them to use a phonics-based approach to Kiswahili literacy;
- an in-service training and coaching programme for teachers that makes use of teacher resource centres and communities of practice
- the provision of an ICT infrastructure, materials and computers to schools and teacher training institutions;
- the establishment of school-based education management information systems (SEMIS) that will improve decision-making processes;
- the provision of technical assistance and policy support;
- improved infrastructure to enhance ICT integration in primary schools and teacher training institutions;
- the development and production of e-content , children's books and other instructional materials; and
- support for policy work that will build capacity (Government of Tanzania, 2011).

An important part of the TZ21 programme is strengthening the professional development and resource support for schools to improve reading instruction in the early grades, and strengthening policies, information and management at the school, community and government levels through a process of educational reforms that is responsive and informed, in support of early grade reading (Government of Tanzania, 2011).

Tanzania Education and Research Network (TERNET)¹⁰³

Based on the need for a national ICT network of universities and other higher education institutions, 21 Tanzanian higher education institutions formally adopted a constitution for the formation of a new national ICT network known as TERNET. TERNET's aim is to connect all universities, other higher education institutions and research institutions in Tanzania. Amongst their intended outcomes are to:

- link training, research and other service delivery institutions to a well-structured national and international data communication gateway;
- promote enhanced ICT application in teaching, research and service delivery; and
- enable the cost-effective utilisation of resources through the sharing and exchange of skills between national and international institutions.

¹⁰² <http://crea-tz21.com>

¹⁰³ <https://www.ternet.or.tz>

Teacher Development for the 21st Century (TDev21)

In 2011, the Tanzanian Ministry of Education and Vocational Training partnered with the World Bank and the Global eSchools and Communities Initiative (GeSCI) on a pilot project to draw on the conceptual frameworks and experiences of the global ICT Competency Framework for Teachers established by UNESCO and others in the USA, Australia, South Africa and Europe, so as to conceptualise a framework for a Tanzanian context.¹⁰⁴

The broader objective of TDev21 was to build teacher capacity in Sub-Saharan Africa for the effective use of ICT in education in general and in Tanzania particularly. The process also drew on the Framework for ICT Use in Teacher Professional Development in Tanzania, which GeSCI developed in 2009 (Hooker et al., 2011b).

Institutional Initiatives

Open University of Tanzania (OUT)¹⁰⁵

OUT is one of East Africa's first universities to offer ODL-based education programmes. In this way, they provide a flexible learning environment that allows their students longer periods for course completion. They operate through a network of 30 regional centres and more than 70 study centres in Tanzania and abroad. They have developed a range of online courses and programmes, including open courses and OER offered by the African Virtual University and MIT. OUT also engaged with OER Africa in 2009, when they held a workshop to explore the prospects for developing an institutional OER policy.

Prospects and Challenges

Tanzania has made progress with the implementation of their national ICT in education policy, through dedicated national projects based on local and international partnerships. The TZ21 project is a case in point, particularly its focus on early-grade reading through active engagement with local communities and the development of teacher capacities to use technologies to support their teaching practice. The TZ21 programme also incorporates dedicated monitoring and evaluation, the results of which will be available later in 2015.

The growth of TERNET, the establishment of a framework for the ICT competency of Tanzanian teachers, and institutional programmes such as those offered by OUT are further examples of progress in the Tanzanian education landscape.

However, the country remains challenged by limited ICT infrastructure access, despite the growth in mobile subscriptions over the past few years. The government is also constrained by limited human resource capacity, and limited ICT expertise in particular.

Furthermore, outside of the TZ21 initiative, there is limited evidence of the effects of investment in ICT on expanding equitable access to quality learning and teaching, as spelt out in Tanzanian national policy documents.

¹⁰⁴ http://www.gesci.org/assets/files/Tanzania_Needs_Assessment_Report_Draft_Final_230911%20_3_.pdf

¹⁰⁵ <http://www.out.ac.tz>

Uganda

Introduction and Background

Of the 40.1 million people in Uganda, 16 per cent live in urban areas. The country falls into the low human development category according to the UNDP (2014s), which ranks Uganda 164th out of 187 countries in terms of the Human Development Index. Uganda ranks 78th out of 143 countries in terms of the quality of its education system (WEF, 2015p). In 2013, it had a secondary education attainment rate of 29.6 per cent and a tertiary attainment rate of nine per cent for its 25 to 54 age group (WEF, 2015p). Uganda has a high level of gender inequality, based on the UNDP's Gender Inequality Index (UNDP, 2014s).

Table 35: Basic Data about Uganda

Indicators	
Population (2013)	40.1 million
Languages	English, Kiswahili
Human Development Index (2013)	0.484 (164 th out of 187 countries and territories)
Gender Inequality Index (2013)	0.529 (115 th out of 149 countries)
Per capita gross national income (2013)	USD 1,335
Life expectancy (2013)	59.2
Mean years of schooling (2013)	5.4
Tertiary educated population	932,000

Sources: Commonwealth Secretariat (2015), UNDP (2014s), WEF (2015p)

Policies, Strategies and Programmes

Policies and laws in education are guided by the Constitution of the Government of Uganda, which was enacted in 1995 and stipulates the right to education for every Ugandan citizen. It also outlines the role of government in the provision of education.

National Vision and Economic Frameworks

The Ugandan government adopted Uganda Vision 2040¹⁰⁶ in 2010, which envisages transforming Uganda from a peasant society to a modern and prosperous country within 30 years.

National Policies and Strategies Related to TEL

Whilst Uganda does not have an explicit national policy on ICT in education, it adopted an Education Sector Strategic Plan for 2004–2015,¹⁰⁷ which makes reference to the importance of technology as a subject and the integration of ICT into courses, so that every student can become computer literate (Government of Uganda, 2004).

The Government of Uganda also adopted a Revised Education Sector Strategic Plan 2007–2015.¹⁰⁸ This makes reference to strengthening science and technology education by providing secondary schools with science laboratories, ICT laboratory rooms and well-stocked libraries (Government of Uganda, 2008).

In 2012, the government adopted a National ICT Policy,¹⁰⁹ which calls for special pricing models for education. It also proposes a comprehensive human resource development plan in ICT. Strategies to deliver on such a plan include establishing a national educational network to enable sharing amongst education institutions, and encouraging academic institutions to embrace eLearning so as to enable equitable regional access to IT training in all parts of the country.

¹⁰⁶ <http://npa.ug/wp-content/themes/npatheme/documents/vision2040.pdf>

¹⁰⁷ http://www.africanchildforum.org/dr/policy%20per%20country/uganda/uganda_education_2004-2015_en.pdf

¹⁰⁸ <http://www.i3c.co.ug/moes%20uploads/Revised%20Education%20Sector%20strategic%20plan%202007-2015.pdf>

¹⁰⁹ http://www.researchictafrica.net/countries/uganda/National_ICT_Policy_for_Uganda_2012.pdf

The policy has a section dedicated to mainstreaming women and proposes strategies that promote ICT as an alternative career for women, youths and people with disabilities in the informal and formal education system; it also specifies the implementation of special ICT training programmes for women, youths and people with disabilities.

Furthermore, the policy contains a dedicated section on ICT in education, which includes: reviewing existing curricula to improve the quality of education and introduce new learning methods; improving investment in ICT equipment, software, and broadband in schools and tertiary institutions; growing the capacity of teachers to use ICTs in the teaching and learning processes; and establishing educational networks for sharing educational resources (Government of Uganda, 2012).

ICT Access and Use

The World Economic Forum (2015e) scores Uganda 3.2 on a scale of 1 to 7 in terms of Internet access in schools. Data on ICT access in education in Uganda re not readily available. However, the ITU (2014) published the following ICT access data for 2013, reflecting low levels of access.

Table 36: Figure 1: ICT Access in Uganda

Fixed telephone subscriptions per 100 inhabitants	0.6
Mobile cellular telephone subscriptions per 100 inhabitants	44.1
Mobile broadband subscriptions per 100 inhabitants	7.4
Households with a computer	4.9%
Households with Internet access at home	5.2%
Individuals using the Internet	16.2%

Source: ITU (2014)

Based on their Network Readiness Index, the World Economic Forum (2015e) ranks Uganda 116th out of 143 countries in 2015.

Major Priorities and Initiatives

National Initiatives

Research and Education Network Uganda (RENU)¹¹⁰

The Vice Chancellors Forum established RENU as a not-for-profit limited company, owned by the universities and research institutions in Uganda. The Uganda Communications Commission granted RENU a special licence to operate a private communications network that can provide an international gateway and transmit members' traffic from NRENs in neighbouring countries. RENU is hosted at Makerere University and has 10–12 active members (public and private universities), who all pay the same membership fee. This fee facilitates group purchasing of bandwidth.

Improving Learning Outcomes through ICT

This project ran from December 2011 to December 2014 and focused on improving learning outcomes for girls, particularly in primary schools in the Apac District of Uganda, through access to ICT. It aimed to train teachers and school administrators in learner-centred teaching and learning methodologies, facilitate access to up-to-date teaching and learning materials, build teachers' capacity, facilitate networking between schools and provide pupils with life skills to improve their self-confidence. The target group was 100 primary school pupils and 40 primary school teachers.

Partners involved in this project included Connect4Change, Edukans, the International Institute for Communication and Development, the Education Local Expertise Centre Uganda, the Forum for the Advancement of Women in Education – Uganda, and I-Network Uganda.

¹¹⁰ <https://www.renu.ac.ug>

Prospects and Challenges

Uganda has made several gains since the adoption of its ICT policy. The government has been able to secure a number of donors and private sector partners in support of key projects. It has also been amongst the first to establish a Green IT project, which involved recycling old computers as a government initiative. In addition, Uganda is home to a number of young, budding entrepreneurs who have an innovative mind-set and who have spun off projects in support of community development.

However, Uganda's education system still experiences many challenges. It is hamstrung by low human resource capacity, and the country continues to be constrained by its dependency on donor funding and its poor ICT infrastructure.

Zambia

Introduction and Background

Of the 15.5 million people in Zambia, 40 per cent live in urban areas. The country falls into a medium human development category according to the UNDP (2014t), which ranks Zambia 141st out of 187 countries in terms of the Human Development Index. Zambia is 36th out of 143 countries in terms of the quality of its education system (WEF, 2015q). In 2013, it had a secondary education attainment rate of 45.5 per cent and a tertiary attainment rate of 9.7 per cent for its 25 to 54 age group (WEF, 2015q). Zambia has a high level of gender inequality, based on the UNDP's Gender Inequality Index (UNDP, 2014t). The Zambian economy not only is vulnerable to natural disasters but also has historically been dependent on its copper mining industry, which has been in decline in recent years. To date, the country has made slow progress with diversifying its economy. Together with continuing high levels of borrowing, the Zambian economy faces an endemic crisis.

Table 39: Basic Data about Zambia

Indicators	
Population (2013)	15.5 million
Languages	English
Economic activity	Copper mining
Human Development Index (2013)	0.561 (141 st out of 187 countries and territories)
Gender Inequality Index (2013)	0.617 (133 rd out of 149 countries)
Per capita gross national income (2013)	USD 2,898
Life expectancy (2013)	58.1
Mean years of schooling (2013)	6.5
Tertiary educated population	501,000

Sources: Commonwealth Secretariat (2015), UNDP (2014t), WEF (2015q)

Policies, Strategies and Programmes

Policies and laws in education are guided by the Constitution, which was enacted in 1996. The Constitution provides for the right to free primary education for all children of primary school age.

National Vision and Economic Frameworks

The Zambian government in 2006 adopted a national framework called Vision 2030,¹¹¹ which envisages that by 2030, Zambia will be a prosperous, middle-income economy and will have achieved the Education for All goals set out by the United Nations in 2000.

In 2011, Zambia also adopted its Sixth National Development Plan 2013 to 2016,¹¹² which further commits to achieving its education, training and skills development goals through the integration of ICT.

National Laws and Policies Related to TEL

The Zambian government has historically been guided by its Education Act of 2011, which makes extensive reference to gender equality and gender mainstreaming.

The government adopted a National ICT Policy in 2006.¹¹³ This policy contains references to education and articulates the government's commitment to realising its education commitments through ICT.

The government also adopted a draft ICT in Education Policy in 2007, which provides an overview of goals, objectives and government commitment in key programme areas of ICT infrastructure for education institutions: content development, curriculum integration, teacher training, distance education,

¹¹¹ <http://unpan1.un.org/intradoc/groups/public/documents/cpsi/unpan040333.pdf>

¹¹² http://siteresources.worldbank.org/INTZAMBIA/Resources/SNDP_Final_Draft_20_01_2011.pdf

¹¹³ <http://unpan1.un.org/intradoc/groups/public/documents/unpan/unpan032690.pdf>

administration and support services, and finance. The policy is still in draft form, and it is reportedly going to be reviewed.

Zambia adopted the Education Sector National Implementation Framework III: 2011–2015,¹¹⁴ which makes extensive reference to investment in ICT and its integration into the education and training system. Some of the policy commitments related to ICT include that the government will:

- provide access to ICT to all schools;
- invest in the potential of broadcast technologies and make these accessible for learners and teachers;
- promote the integration of ICT in the professional development of teachers; and
- promote the acquisition and development of digitised curriculum content, including broadcast content (Government of Zambia, 2011a).

ICT Access and Use

The World Economic Forum (2015e) scores Zambia 3.6 on a scale of 1 to 7 in terms of Internet access in schools. Data on ICT access in education in Zambia are not readily available. However, the ITU (2014) published the following ICT access data for 2013, reflecting low levels of access.

Table 40: ICT Access in Zambia

Fixed telephone subscriptions per 100 inhabitants	0.8
Mobile cellular telephone subscriptions per 100 inhabitants	71.5
Mobile broadband subscriptions per 100 inhabitants	0.7
Households with a computer	5.9%
Households with Internet access at home	5.9%
Individuals using the Internet	15.4%

Source: ITU (2014)

Based on their Network Readiness Index, the World Economic Forum (2015e) ranks Zambia 114⁺ out of 143 countries in 2015.

Major Priorities and Initiatives

National Initiatives

One of the initiatives in which the Ministry of Education is currently involved relates to the development of video broadcast content that aligns with the national curriculum. The Ministry is planning a capacity-building programme so that digital content can be developed within the Ministry.

Institutional Initiatives

iSchool Zambia

iSchool Zambia is a tablet-based learning solution that has been tested in Zambian public and private schools. It involves the distribution of a ruggedised tablet known as the Zedu-pad, which contains curriculum content for learners and teachers. The model also includes dedicated tablets for teachers, a secure charging cabinet, solar-power equipment as well as teacher training and ongoing support.

Thus far, the model has been tried in a few government schools.

Technical and Vocational Teachers College (TVTC)

TVTC, one of Zambia's leading TVET colleges, has invested in a laptop loan scheme for teachers and in programmes to support teachers with the integration of ICT. In partnership with COL and 12 other TVET institutions across Commonwealth Africa, since 2010 TVTC has engaged in what has become an active

¹¹⁴ http://planipolis.iiep.unesco.org/upload/Zambia/Zambia_Education_Sector_NIF_III_2011_2015_Final_Draft.pdf

partnership and community of practice known as Innovation in Vocational Education and Skills Training in Africa (INVEST Africa).

Through this partnership, TVTC was supported in: (i) developing an institutional policy and strategic plan on flexible and blended learning through the use of ICT; (ii) investing in ICT infrastructure by, amongst other means, establishing PC labs, an e-library and a loan scheme for teachers to purchase their own laptops; and (iii) developing courses as OER, which they use for open, distance and flexible learning (Isaacs, 2015).

Prospects and Challenges

The Zambian government expresses clear commitment to promoting access to ICT in education institutions and to developing partnerships to realise its policy objectives.

The government also commits to the promotion of gender equality and women's empowerment in its ICT policy.

However, Zambia remains severely hamstrung by infrastructural and human resource constraints. Its national plans and programmes are also strongly dependent on international donor aid, which limits the sustainability of its ICT in education initiatives and reinforces the country's dependency.

CHAPTER 4

SUMMARY OF FINDINGS AND IMPLICATIONS

The rationale for investing in ICT in all Commonwealth countries in Africa and the Mediterranean is underpinned by a strongly held assumption that ICT enables a transformational agenda towards more globally competitive, more economically elevated, more inclusive, less unequal, knowledge-based economies and societies. The transformation of the education and skills development systems in each country, under the influence of digital technologies, is considered pivotal. This is the dominant discourse reflected in all vision statements for all countries covered in this report, without exception. It is reinforced by a global view promoted by organisations such as the World Economic Forum, whose latest Global IT Report 2015 is entitled *ICT for Inclusive Growth* (WEF, 2015e).

Whilst these aspirational policy statements contain a technology-determinist and market-driven logic, they are at the same time over-ridden by a rights-based approach to education, espoused in each country's supreme law: the national constitution. Most of these countries' constitutions stipulate the right to education for all citizens. Even in the constitutional monarchies, these rights are articulated to a limited extent.

The UN's most recent post-2015 agenda as outlined in the Sustainable Development Goals — anchored in Amartya Sen's work on capabilities, choices and freedoms — places more emphasis on expanding the richness of human life, on people's freedoms and choices above and beyond their economic lives (UNDP, 2015). COL's approach to open, distance and flexible learning through the use of appropriate technologies is aligned with this approach (COL, 2015), as are the approaches of the Commonwealth countries covered in this report.

The policy conversation is also influenced by the African Union's Agenda 2063,¹¹⁵ which spells out its vision for the continent for the next 50 years. This document also accentuates an increasing focus on the intersection between human rights and cyberspace, as demonstrated by the recent African Declaration on Internet Rights and Freedoms,¹¹⁶ which has been adopted primarily by African civil society organisations. The declaration emphasises the role of the Internet in cultivating and enabling all human rights, including the right to education, information, language and culture.

Thus, the policies and laws that govern TEL and skills development are informed by the complex contradictions between fostering individualism, liberalised markets, economic growth and competitiveness on the one hand and universal access to quality education, social justice, well-being and equity on the other.

For more than 20 years, Commonwealth countries in Africa and the Mediterranean have invested in the promise of digital technologies for education and human development. It is therefore fair to ask whether the experiences of the past two decades have taken countries along the promised path towards more globally competitive, inclusive, equitable, knowledge-based economies and transformational education and skills development outcomes. This illustrative, high-level overview of 20 countries reflects on some aspects related to these goals.

ICT Infrastructure Has Expanded Significantly in All Countries... But Not Enough

Under the influence of government policy based on market liberalisation and the increasing involvement of the private sector (African Development Bank, 2013), the past 15 to 20 years have witnessed a significant expansion in ICT infrastructure and access in all Commonwealth countries at the national and institutional levels.

Although still lagging behind the rest of the world, African countries have experienced steady growth in Internet penetration, from 0.78 per cent in 2000 to 20.71 per cent in 2014. The rate of growth has also been faster than in other regions. For example, Internet penetration in Europe was 19.6 times greater than that

¹¹⁵ <http://agenda2063.au.int/en/about>

¹¹⁶ <http://africaninternetrights.org/declaration-container/declaration>

of Africa in 2005, but by 2014, it was only 3.9 times greater. From 2009 to 2014, Africa's international Internet bandwidth also increased 20-fold and has now passed two terabytes per second, and its terrestrial network has more than doubled over the same period (Niyerenda-Jere & Biru, 2015). Much reference has been made to the rapid increase in mobile access, with mobile subscriptions growing from one per cent in 2000 to 69 per cent in 2014. Several countries, such as Seychelles, Mauritius, Ghana and South Africa, have mobile subscription rates in excess of 100 per cent. However, coverage is particularly challenging in rural areas, where the reach of basic infrastructure, including electricity, is limited (ITU, 2014). Nevertheless, the prospects for utilising the expansion of ICT infrastructure for educational purposes have manifoldly increased.

This report has also shown that amongst higher education institutions in Africa, infrastructure development has been boosted by the creation of NREs. The AfricaConnect project of the UbuntuNet Alliance established a high-capacity Internet network for research and education in southern and eastern Africa, providing the region with a gateway to global research collaboration. Today, the continent boasts established NREs in Cameroon, Ghana, Kenya, South Africa, Tanzania and Uganda (Barry, 2011).

In the schools sector and TVET, ICT infrastructure has increased since 2000. A recent study of 13 TVET institutions in Commonwealth Africa revealed that ICT infrastructure expanded significantly for each institution between 2012 and 2015, even though, as in the schools sector, many still experience unreliable Internet connectivity (Isaacs, 2015).

However, a gendered digital divide persists, particularly biased against poor communities in rural areas that still do not have access to network infrastructure and international bandwidth capacity. In urban areas, unreliable connectivity and high bandwidth costs continue to define Sub-Saharan Africa's Internet market (Deen-Swarray, Gillwald, & Morrell, 2012; ITU, 2014; Niyerenda-Jere & Biru, 2015).

Compared to 20 years ago, there is greater opportunity to expand the reach of ODL, but universal reach remains constrained by the continued exclusion of the majority of the populations, particularly in Africa.

Evidence on Education Transformation Remains Thin

An exponential growth in learning tools for teachers and learners has also accompanied the expansion in ICT infrastructure, to the extent that these resources are increasingly becoming limitless. However, despite this trend, and despite increasing examples of educational gains being made, particularly at a micro level, there is still not a compelling case that at the national and regional levels in Commonwealth Africa and the Mediterranean, digital technologies have enabled equitable access to quality learning for all. At a macro level, we still lack evidence that technology investments have: enabled improved learning and teaching; produced quality teachers; made quality education more widely available; and challenged inequities in education systems. Optimistic claims about the potential of educational technologies are not yet reflected in the existing progress statistics on education, skills development and youth employability in Commonwealth Africa and the Mediterranean. This fact also highlights the need to revisit the prevailing measures of progress and transformation in education and skills development, which are predominantly quantitative indicators focused on gender-disaggregated enrolment ratios, teacher-student ratios and test scores. These are measures of a traditional education paradigm. Similarly, attempts at measuring the "information society" or knowledge economy also emphasise technology access ratios. A new approach to determining education progress and transformation in a digitised 21st century, relevant to an African and Mediterranean context, is required, especially in official policy spaces. Recent reports by Johnson and colleagues (2015a) on measuring learning in the 21st century and by the Asia Society (2014) contribute to these evolving debates.

It is also noteworthy that some of the studies and evaluations of institutional experiences in schools, TVET institutions and universities reflect on the ways technologies are used to reinforce existing, traditional systems based on knowledge of curriculum content through standardised testing, and how technologies can support teachers in covering the curriculum. Less attention is given to how technologies have influenced changes in the learning and pedagogic styles and cultures that personalised learning technology ecosystems are purported to catalyse, and how these challenge the structure and culture of traditional education systems (Isaacs, 2015; Ndlovu & Lawrence, 2012; Muianga et al., 2013).

Equally important is the need to highlight strategies to manage the changes that accompany the adoption of digital technologies at different levels in the system. On this, too, many of the dominant conversations are silent, even though the need for change management strategies has in a few cases been highlighted (Herselman & Botha, 2015).

The renewed focus on tablet-based learning in schools places more emphasis on the promotion of paperlessness and the prospect of one-to-one access to technologies. It follows previous large-scale attempts at rolling out PC labs and providing laptops to teachers and learners (Botswana's Thuto Net, Gauteng Online, the Khanya Project in South Africa and One Laptop Per Child in Rwanda). However, even though a number of projects have included research, learning, monitoring and evaluation, many of these past initiatives were not always accompanied by dedicated monitoring and evaluation processes from which critical lessons could be drawn and the extent of their impact could be ascertained. This means that new initiatives, by running the risk of repeating mistakes of the past, could potentially become costly and wasteful.

The implications are that in official policy spaces, greater attention needs to be placed on how competencies, skills, learning and knowledge can be assessed in a digitised, 21st-century African and Mediterranean context. It is noteworthy that Johnson and colleagues (2015b) identified deep learning approaches — which include project-based and challenged-based learning and blended learning designs — as two key trends that will drive technology decision making over the next five years. These trends, however, feature less in present-day developing country contexts such as in Commonwealth Africa and the Mediterranean, as is evident from this report.

It also means that we need to improve the evidence base for a wide range of claims related to the relationship between digital technologies and education access, quality and equity, and the concomitant gains in productivity and efficiency. Plus, we need to monitor the strategies for managing changes at the institutional and national levels. Here, drawing on the experiences of other Commonwealth countries, particularly in the global South, would be worthwhile.

Gender Inequality Persists

Almost all country reports have shown that even though some policies contain pronouncements and commitments to gender equality and women's empowerment, the Gender Inequality Indices of all African and Mediterranean Commonwealth countries reflect the persistence of gender inequity and biases economically, politically and socially. This also suggests that investments in ICT have not significantly challenged gender inequality in the region. Here the debates on frameworks for the empowerment of women and girls, and the integration and "mainstreaming" of gender equality in relation to technology-enabled education, need to focus on how gendered power relations can be transformed with the support of technologies.

It is also noteworthy that measures of gender equality and women's empowerment in 21st-century education and skills development require more considered thought and application.

Technological Change Opening Up New Vistas

Still, continuing and rapid shifts in learning technologies keep on raising new possibilities for genuine education transformation that cannot be ignored. The onset of mobile technologies, cloud computing, big data, OER, MOOCs, the Internet of Things, and much more continues to raise new possibilities for the expansion in access to quality learning opportunities. Each wave of new technological innovation will continue to be accompanied by experiments with their implications for learning, teaching and education delivery. Johnson and colleagues (2015b) have conjectured that Bring Your Own Device (BYOD) and makerspaces are expected to be increasingly adopted by schools in one year's time or less, that 3D printing and adaptive learning technologies are estimated to arrive within two to three years, and that digital badges and wearable technology are expected to be mainstream in schools within four to five years. Their report is, however, biased towards experiences in schools in the global North.

Bottom-up Development

There appears to be a groundswell of promising initiatives underway across Commonwealth Africa. They range from the rise of an African "maker" movement, to renewed mobile learning interventions and programmes, to institutional policies on open access and OER. These initiatives appear to emerge from the "bottom" up as opposed to the historical evolution pattern to date, of predominantly top-down programmes for ICT in education and TEL.

Conclusion

This baseline study has provided a brief illustrative overview of the status of TEL in each of the 20 Commonwealth countries in Africa and the Mediterranean. In doing so it provides some indication of where it may be best for COL to provide partnership and support over the next six years.

The study shows that there is a policy vacuum in the development of OER and open access policies at the institutional and national levels. Only a few tertiary institutions have developed OER or open access policies. Even fewer country governments have developed national policies related to OER and open access. This provides an opportunity for COL to partner with regional, national and institutional bodies in support of awareness raising, capacity building and the development of enabling policies to promote open and flexible learning.

The study also found limited evidence of impact. Hence, COL's focus over the next six years on demonstrating impact on sustainable livelihoods by drawing on good programmatic design principles and growing the evidence base by integrating research, monitoring and evaluation in its ODL programmes, will also be valuable in the TEL space.

The study also highlights the extensive reference that is made in policy and strategy documents to how digital technologies can transform education and skills development. However, the models and pathways for transforming education systems are yet to be spelled out more clearly. Competency frameworks have been developed for teachers, spelling out the range of skills, qualities and competencies for teaching in the 21st century, and these have been applied to an African and Mediterranean context. But there has been less modelling of transformed education systems under the influence of technologies in a developing country context in Africa and the Mediterranean. There would be great value in analysing the stage of TEL investment and development that each of the countries has reached, against a broader development framework and a change trajectory that are relevant to African and Mediterranean contexts.

This baseline has also shown that the role of TEL in supporting gender equality and the empowerment of women and girls is underexplored terrain in Africa and the Mediterranean. Here too, COL can make a valuable contribution in view of its commitment to mainstreaming gender, as spelled out in its current six-year strategy.

Finally, COL has been instrumental in catalysing critical conversations in ICT and learning spaces, particularly with reference to OER and open, distance and flexible learning. COL's contributions to the global OER movement have been instructive. This baseline also points to a need for further critical and sober-minded engagement with the perils and promises of TEL, in ways that challenge the predominance of over-optimistic claims about their transformational potential.

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Appendix 1

Terms of Reference

To undertake a desktop study that reviews available documents on the Web and that uses online/ email surveys of stakeholders to develop a baseline study report for COL in the area of technology-enabled learning in the Commonwealth countries of Africa and the Mediterranean region, covering:

1. Botswana
2. Cameroon
3. Cyprus
4. Ghana
5. Kenya
6. Lesotho
7. Malawi
8. Malta
9. Mauritius
10. Mozambique
11. Namibia
12. Nigeria
13. Rwanda
14. Seychelles
15. Sierra Leone
16. South Africa
17. Swaziland
18. Tanzania
19. Uganda
20. Zambia

A. The report shall include the following:

- Country-wide status of ICT in education, including the availability of policies related to ICT, ICT in education, open educational resources (OER), etc.
- National priorities and initiatives on ICT in education, including the presence of major donors and their activities in the area of technology-enabled learning;
- Identification of key agencies/ institutions and ministries involved in technology-enabled learning;
- Identification of institutions offering courses using technology (especially online learning) and the availability of institutional policy on eLearning/ technology-enabled learning;
- Availability of OER repositories in different subjects, and gaps in the topics/ subjects related to media and ICT skill development;
- Estimate of approximate number of teachers to be trained in the next six years in the area of technology-enabled learning in each of the countries;
- Estimate of approximate number of students studying ICT and media-related courses in each of the countries.

- B. The report should critically examine the country-wide reports and also present consolidated tables as appendices as needed.
- C. The expected length of the report shall be about 50 pages (A4 size, with about 320 words per page), excluding appendices, and will use APA 6th edition reference style.

Note: The report has become bigger than expected due to the volume of information available on the subject matter; it was important to cover all of these materials to give a relatively complete picture.

Appendix 2

Summary of TEL in the African and Mediterranean Commonwealth Countries

Part 1: First 10 countries alphabetically

Country	Botswana	Cameroon	Cyprus	Ghana	Kenya	Lesotho	Malawi	Malta	Mauritius	Mozambique
ICT in education policy? If yes, see link(s) to source(s).	No	No	No	Yes ¹¹⁷	Yes ¹¹⁸	No	No	Yes ¹¹⁹	No	No
Year of ICT in education policy. Is revision due?	N/A	N/A	N/A	2008	2006	N/A	N/A	2008	N/A	N/A
ICT in education policy covers OER?	N/A	N/A	N/A	No	No	N/A	N/A	No	N/A	N/A
ICT in education policy covers gender issues?	N/A	N/A	N/A	Yes	Yes	N/A	N/A	No	N/A	N/A
National open licence policy available? If yes, see the link.	No	No	No	No	No	No	No	No	No, but it is in the process of preparing an OER policy	No
Open licence policy for projects/	BOCODOL OER Policy	N/A	N/A	KNUST ¹²⁰ CSIR Ghana ¹²¹	Africa Nazarene University	N/A	N/A	N/A	N/A	N/A

¹¹⁷ http://www.moe.gov.gh/assets/media/docs/ICTinEducationpolicy_NOV2008.pdf

¹¹⁸ <http://nepadkenya.org/documents/MOE-ICT%20in%20Education.pdf>

¹¹⁹ <http://www.ictmalta.org/sites/default/files/uploadedimages/e-learning%20strategy%20Malta.pdf>

¹²⁰ <http://archive.knust.edu.gh/downloads/20/20411.pdf>

Country	Botswana	Cameroon	Cyprus	Ghana	Kenya	Lesotho	Malawi	Malta	Mauritius	Mozambique
institutions? If yes, see the project/ institution and the link.					¹²²					
Major OER repositories? If yes, see the name and the link.	BOCODOL ¹²³	N/A	N/A	African Health OER Network at KNUST ¹²⁴	OER@AVU ¹²⁵ OER Africa ¹²⁶	N/A	College of Medicine, University of Malawi ¹²⁷	N/A	N/A but planning a national OER platform to service tertiary institutions	N/A
Institutions offering online programmes	BOCODOL ¹²⁸	University of Yaounde I ¹²⁹	N/A	Institute of Distance Learning at KNUST ¹³⁰	AVU, University of Nairobi, Kenyatta University	National University of Lesotho ¹³¹	College of Medicine, University of Malawi ¹³²	N/A	University of Mauritius ¹³³ Mauritius Institute of Education ¹³⁴	Catholic University of Mozambique ¹³⁵

¹²¹ <http://www.csir.org.gh>

¹²² https://wiki.creativecommons.org/images/9/94/ANU_Policy_on_OER_integration_into_ODeL_approved_Version.pdf

¹²³ <http://www.bocodolac.bw>

¹²⁴ <http://www.knust.edu.gh>

¹²⁵ <http://oer.avu.org>

¹²⁶ <http://www.oerafrica.org>

¹²⁷ <http://www.medcol.mw/e-learning>

¹²⁸ <http://www.bocodolac.bw>

¹²⁹ <http://www.uy1.uninet.cm>

¹³⁰ <http://idl.knust.edu.gh>

¹³¹ <http://www.nul.ls>

¹³² <http://www.medcol.mw/e-learning>

¹³³ <http://www.uom.ac.mu>

¹³⁴ <http://www.mie.ac.mu/home/categories/open-distance-learning.html>

¹³⁵ <http://www.ucm.ac.mz/cms>

Country	Botswana	Cameroon	Cyprus	Ghana	Kenya	Lesotho	Malawi	Malta	Mauritius	Mozambique
Institutions with policy on eLearning and/or TEL?	N/A	N/A	N/A	N/A	AVU ¹³⁶	N/A	N/A	N/A	N/A	N/A
Key national priorities or initiatives in ICT in education	ThutoNet Sesigo ¹³⁷	One Laptop Per Child	ICT for Inclusion ¹³⁸ Web-based education in secondary schools	Ghana Open Data Initiative ¹³⁹	Ministry of Education Tablets for Learning ¹⁴⁰ Kenya Open Data Initiative ¹⁴¹ School of Open Kenya ¹⁴²	African Storybook Project ¹⁴³ ; Africa Schools Technology Innovation Centre ¹⁴⁴ OER for Open Schooling ¹⁴⁵	OneBillion.org ¹⁴⁶ Tablet Learning and Teaching Project ¹⁴⁷	Game Lectures and Game Nights	Mauritius Tablet PC Project ¹⁴⁸ Tertiary Education Commission ¹⁴⁹ National OER Policy Project	Mozambique Research and Education Network ¹⁵⁰ MICTI ¹⁵¹
Key ministries and institutions	Botswana Ministry of Education	Ministry of Basic Education,	Ministry of Education and	CSIR Ghana ¹⁵⁷	Ministry of Education, Science	Ministry of Education and	Ministry of Education, Science	Ministry of Education and	Ministry of Education and Human	Ministry of Education and Culture ¹⁶⁷

¹³⁶ <http://www.avu.org>

¹³⁷ <http://www.sesigo.org.bw>

¹³⁸ <https://www.european-agency.org/agency-projects/ict4i>

¹³⁹ <http://data.gov.gh/about-us>

¹⁴⁰ <http://www.cio.co.ke/news/main->

¹⁴¹ <https://opendata.go.ke>

¹⁴² <http://schoolofopen.p2pu.org/school-of-open-africas-launch-and-future>

¹⁴³ <http://www.africanstorybook.org>

¹⁴⁴ <http://www.microsoft.com/southafrica/africastic/Overview.htm>

¹⁴⁵ <http://www.cedol.org/wp-content/uploads/2013/09/OER-for-Open-Schools-initiative-Ferreira.pdf>

¹⁴⁶ <https://onebillion.org/partners>

¹⁴⁷ <http://www.nyasatimes.com/2014/06/22/malawi-schoolkids-given-tablet-computers-bringing-teaching-up-to-date>

¹⁴⁸ <http://www.tabletpc.intnet.mu/index.html>

¹⁴⁹ <http://tec.intnet.mu>

¹⁵⁰ <http://www.ubuntunet.net/morenet>

¹⁵¹ <http://www.micti.co.mz/micti/index.php>

Country	Botswana	Cameroon	Cyprus	Ghana	Kenya	Lesotho	Malawi	Malta	Mauritius	Mozambique
	and Skills ¹⁵²	Ministry of Higher Education ¹⁵³ Ministry of Secondary Education ¹⁵⁴	Culture ¹⁵⁵ Ministry of Transport, Communication and Works ¹⁵⁶		and Technology ¹⁵⁸ Kenya Institute for Curriculum Development ¹⁵⁹	Training ¹⁶⁰ Ministry of Communications, Science and Technology ¹⁶¹	and Technology ¹⁶²	Employment ¹⁶³	Resources ¹⁶⁴ Ministry of Technology, Communication and Innovation ¹⁶⁵ Tertiary Education Commission ¹⁶⁶	Ministry of Science and Technology ¹⁶⁸

¹⁵⁷ <http://www.csir.org.gh>

¹⁶⁷ <http://www.mec.gov.mz/Pages/Home.aspx>

¹⁵² <http://www.gov.bw/en/Ministries-Authorities/Ministries/Ministry-of-Education-MoE>

¹⁵³ <http://www.minesup.gov.cm>

¹⁵⁴ <http://www.minesec.cm>

¹⁵⁵ <http://www.moec.gov.cy/en>

¹⁵⁶ http://www.mcw.gov.cy/mcw/mcw.nsf/index_en/index_en

¹⁵⁸ <http://www.education.go.ke>

¹⁵⁹ <http://www.kicd.ac.ke>

¹⁶⁰ <http://www.gov.ls/education>

¹⁶¹ <http://www.gov.ls/comms>

¹⁶² https://www.malawi.gov.mw/index.php?option=com_content&view=article&id=21&Itemid=21;

¹⁶³ <http://education.gov.mt/en/Pages/educ.aspx>

¹⁶⁴ <http://ministry-education.gov.mu>

¹⁶⁵ <http://mtci.govmu.org/English>

¹⁶⁶ <http://tec.intnet.mu>

¹⁶⁸ <http://www.mctestp.gov.mz>

Part 2: Second 10 countries alphabetically

Country	Namibia	Nigeria	Rwanda	Seychelles	Sierra Leone	South Africa	Swaziland	Tanzania	Uganda	Zambia
ICT in education policy? If yes, see link(s) to source(s).	Yes ¹⁶⁹	Yes	Yes ¹⁷⁰	No	No	Yes ¹⁷¹	No	Yes	No	Yes
Year of ICT in education policy. Is revision due?	2005	2010	2008	N/A	N/A	2004 Revision is due.	N/A	2007	N/A	2007
ICT in education policy covers OER?	No	No	No	No	No	No	No	No	N/A	N/A
ICT in education policy covers gender issues?	Yes	No	Yes	No	No	No	No	No	N/A	Yes
National open licence policy available? If yes, see the link.	N/A	N/A	N/A	N/A	N/A	No but White Paper on Post-School Education and Training ¹⁷²	N/A	N/A	N/A	N/A

¹⁶⁹ http://www.nied.edu.na/publications/AdditionalDocuments/Published_ICT_Policy_2005-15March2005.pdf

¹⁷⁰ http://www.mineduc.gov.rw/fileadmin/user_upload/ICT_in_Education_Policy_draft1-2_01.pdf

¹⁷¹ <http://www.education.gov.za/LinkClick.aspx?fileticket=Keu0%2fbkkee%2bM%3d&tabid=191&mid=484>

¹⁷² <http://www.dhet.gov.za/SiteAssets/Latest%20News/White%20paper%20for%20post-school%20education%20and%20training.pdf>

Country	Namibia	Nigeria	Rwanda	Seychelles	Sierra Leone	South Africa	Swaziland	Tanzania	Uganda	Zambia
						mentions OER				
Open licence policy for projects/institutions? If yes, see the project/institution and the link.	N/A	National Open University of Nigeria ¹⁷³	N/A	N/A	N/A	UCT ¹⁷⁴ UNISA	N/A	N/A	N/A	Zambia Library Consortium ¹⁷⁵
Major OER repositories? If yes, see the name and the link.	N/A	N/A	Open Learning Exchange Rwanda ¹⁷⁶	N/A	N/A	OER Africa ¹⁷⁷ OER@UNISA ¹⁷⁸ OpenUCT Repository	N/A	Open University of Tanzania collaborating with OER Africa	Open Access Library of Virtual University Uganda ¹⁷⁹	N/A
Institutions offering online programmes	Polytechnic Namibia ¹⁸⁰ University of	NOUN ¹⁸² Obafemi Awolowo University Centre for Distance	Kepler Kigali ¹⁸³	N/A	N/A	UNISA UCT	N/A	Open University of Tanzania	Department of Open and Distance Learning at Makerere	

¹⁷³ http://www.moocest.vm-host.net/files/NOUN_OER_POLICY_20150204.docx

¹⁷⁴ <https://www.uct.ac.za/downloads/uct.ac.za/about/policies/UCTOpenAccessPolicy.pdf>

¹⁷⁵ <http://www.eifl.net/country/zambia>

¹⁷⁶ <http://www.olerwanda.org>

¹⁷⁷ <http://www.oerafrica.org/>

¹⁷⁸ <http://uir.unisa.ac.za/>

¹⁷⁹ <http://www.virtualuni.ac.ug/library>

¹⁸⁰ <http://www.polytechnic.edu.na/?q=centres/coll/study-elearning;>

Country	Namibia	Nigeria	Rwanda	Seychelles	Sierra Leone	South Africa	Swaziland	Tanzania	Uganda	Zambia
	Namibia ¹⁸¹	Learning							University ¹⁸⁴	
Institutions with policy on eLearning and/or TEL?	N/A	N/A	N/A	N/A	N/A	UNISA ¹⁸⁵	N/A	N/A	Makerere University (ICT policy) ¹⁸⁶	TVTC (ODFL policy using ICT)
Key national priorities or initiatives in ICT in education	NAMCOL Namibia eLearning Centre NOLNET	Open Data Initiative	OLPC Rwanda ¹⁸⁷ Rwanda Education Commons ¹⁸⁸ Innovation for Education	Centre of Excellence in ICT ¹⁸⁹	Government Interactive Virtual Education ¹⁹⁰ Lamtech Consult	Operation Phakisa ICT Lab ¹⁹¹ SANREN ¹⁹²	National Partnerships with JICA	TZ21 Tanzania Education and Research Network TDev21	Research and Education Network Uganda	Video Broadcast Content Development
Key ministries and	Ministry of Education	Ministry of Communication	Ministry of Education ¹⁹³	Ministry of Education ¹⁹⁴	Ministry of Education	Department of Basic	Ministry of Education and	Ministry of Education and	Uganda Ministry of Education	Ministry of Education,

¹⁸² <http://www.nou.edu.ng>

¹⁸³ <http://kepler.org>

¹⁸¹ <http://www.unam.edu.na/ces>

¹⁸⁴ <http://www.distance.mak.ac.ug>

¹⁸⁵ <http://uir.unisa.ac.za>

¹⁸⁶ <http://www.oerafrica.org/system/files/7618/makerere-university-ict-policy-2005-2009.pdf?file=1&type=node&id=7618>,

¹⁸⁷ <http://one.laptop.org/map/rwanda>

¹⁸⁸ <http://www.mineduc.gov.rw/about-the-ministry/projects/rwanda-education-commons>

¹⁸⁹ <http://cdac.in/index.aspx?id=project5>

¹⁹⁰ <http://www.sierrawifi.com>

¹⁹¹ <http://www.gov.za/sa-connect-%E2%80%93implementing-broadband-policy-and-strategy>

¹⁹² <http://www.sanren.ac.za>

¹⁹³ <http://mineduc.gov.rw/home>

¹⁹⁴ <http://www.education.gov.sc>

Country	Namibia	Nigeria	Rwanda	Seychelles	Sierra Leone	South Africa	Swaziland	Tanzania	Uganda	Zambia
institutions	and Sport National Institute for Education and Develop- ment	Technol- ogy Ministry of Education	Rwanda Education Board Ministry of Communi- cation Kigali Institute of Education			Education ¹⁹⁵ Depart- ment of Higher Education ¹⁹⁶ Depart- ment of Communi- cations ¹⁹⁷	Training ¹⁹⁸	Vocational Training ¹⁹⁹	and Sports ²⁰⁰ Uganda Communi- cations Commis- sion ²⁰¹ National Curricu- lum Develop- ment Centre ²⁰²	Science, Vocation- al Training and Early Education ²⁰³ Zambia Informa- tion and Commun- ication Technol- ogy Authority ²⁰⁴

¹⁹⁵ <http://www.education.gov.za>

¹⁹⁶ <http://www.dhet.gov.za/SitePages/Home.aspx>

¹⁹⁷ <http://www.doc.gov.za>

¹⁹⁸ http://www.gov.sz/index.php?option=com_content&id=208&Itemid=113

¹⁹⁹ <http://www.moe.go.tz>

²⁰⁰ <http://www.education.go.ug>

²⁰¹ <http://www.ucc.co.ug>

²⁰² <http://www.ncdc.go.ug>

²⁰³ <http://www.moe.gov.zm>

²⁰⁴ <http://www.zicta.zms>