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UNESCO Institute
for Information Technologies
in Education

A. Atieno Adala

Current State of Advancement of Open Educational Resources in Kenya



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UNESCO Institute for Information Technologies in Education

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Preface

The UNESCO Institute for Information Technologies in Education (UNESCO IITE) is implementing a project on Open Educational Resources (OER) aimed at promotion of the OER movement in non-English-speaking countries. Since 2009, the needs and challenges for open education and OER have been surveyed in the Republic of Azerbaijan, Republic of Armenia, Republic of Belarus, Republic of Kazakhstan, Republic of Moldova, the Russian Federation, Ukraine, Uzbekistan, as well as in Latvia and Lithuania. The results of the cross-national survey of OER in the Commonwealth of Independent States were published in the monograph "CIS on the Way towards OER". Later on the geographical scope of the IITE OER project expanded to include Japan, People's Republic of China, Brazil, Turkey and Vietnam. UNESCO IITE published as separate volumes the case studies on OER in Lithuania, Brazil (this study was considered by Stephen Downes as one of the top publications on OER in 2011 and later translated into the Portuguese), China, Poland, Russia and France (2011, 2012, 2013 and 2015, respectively). Several other case studies surveying best practices in OER in non-English-speaking countries are under preparation for publication. In total, 20 non-English speaking countries were surveyed.

This publication was intended to shed light on the current state of advancement of OER in Kenya. It provides a brief outline of Kenya's national policies and strategies for ICT in education, as well as government initiatives and collaboration with UNESCO and the Commonwealth of Learning in developing a national OER policy. The study is based on the overview of regional and international projects implemented in Kenya at national and institutional level. The report contains the results of the analysis of challenges for the promotion of OER and Open Educational Practices (OEP) in Kenya, ranging from copyright issues to awareness and preparedness of main stakeholders to produce and use OER. A very important is establishing of funding mechanisms for the production of OER, technological challenges and quality assurance. In conclusion, the author proposes the recommendations for OER integration into the learning and teaching process, which include the steps to be taken to overtake the challenges.

Even though the OER movement in Kenya is at an early stage, we believe that this publication will attract the attention of national and institutional decision-makers to the importance of promoting OER and OEP. We also hope that it will contribute to awareness raising on OER among high and higher school educators and Kenyan academic community as a whole.

Alexander Khoroshilov
UNESCO IITE Head a.i.

Executive Summary

The purpose of this study is to explore the status of the creation, use and/or management of open education resources (OER) in Kenya. OER, which to a large extent depend on access to Information Communication Technology (ICT), are seen by proponents as offering certain opportunities to improve access to and quality of education. Like many other countries in sub-Saharan Africa, Kenya finds itself in a period in history where ICT is revolutionizing society in an unprecedented fashion. In education, such technological revolution is being harnessed to transform teaching and learning with one important aspect being access to and development of learning materials. OER is a global movement in education spanning many countries and initiatives, it is therefore timely to explore if and how the movement is taking shape in Kenya.

Chapter one provides an overview of Kenya's national policies and strategies for ICT and ICT in Education. Kenya's commitment to developing the ICT sector is outlined in the ICT Master Plan, which envisions Kenya as an ICT hub and a globally competitive knowledge and digital economy. The objectives and strategies for ICT in education are outlined in the Ministry of Education's Sessional Paper (2012). The document outlines the government strategies and policies to harness ICT across every level of the education sector — for teaching and learning, access to instruction and resources, for professional development, and for management. It also describes various government initiatives with respect to OER, such as collaboration with UNESCO and COL, including the beginning of a process to develop a national OER policy.

Chapter two describes various international and regional OER initiatives in Kenya. These focus on teacher education such as AVU teacher education OER modules, and the Teacher Education in Sub-Saharan Africa (TESSA) initiative, and OER Africa, a multidisciplinary initiative working across a number of subject areas, such as health, agriculture, teacher education that partners with African institutions in support of OER integration and OER policy development. Most of these international and regional initiatives have mainly partnered with higher education institutions in Kenya with the exception of School of Open Africa that has engaged with secondary schools, and the example of the Commonwealth of Learning (COL) collaboration with some technical and vocational colleges in Kenya to develop OER for non-formal programmes.

The focus of chapter three is examples of OER initiatives at Kenyan universities. Most tertiary institutions in Kenya are to some extent involved in innovative learning programs that seek to take advantage of advancements in ICT. A significant number of universities now have some form of open, distance and e-learning. These universities have begun to incorporate or experiment with the use or creation of OER. Similarly, nearly all major universities in Kenya now have online repositories of their research and instructional materials but with varying degrees of protection of intellectual property rights, with

some resources being open access. The universities described here include Africa Nazarene University (ANU), Egerton University, Kenyatta University (KU), University of Nairobi (UON) and United States International University (USIU). Also described is the Borderless Higher Education for Refugees (BHER), a consortium of Kenyan and Canadian Universities.

The focus of the final chapter is to highlight the challenges and provide recommendations for OER adoption in Kenya. OER adoption in Kenya is gaining momentum as evidenced by the various OER initiatives being implemented in the country. However, the process of OER adoption in the country still faces various challenges that range from socio-cultural and economic in nature to lack of appropriate institutional and national policies. To survey the challenges and recommendations, the dimensions of open education resources and open education practices (Ehlers, 2011) are used as a sensitizing framework.

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Introduction

The term *Open Educational Resources* (OER) was first used by UNESCO at its 'Forum on the Impact of Open Courseware for Higher Education in Developing Countries' in 2002, where OER was defined as *"The open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes."* (UNESCO, 2002)

Another significant actor in the OER space is the Hewlett Foundation. They define OER as *"Teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and repurposing by others."*

The OECD defines OER as *"Digitized materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research"* (Ischinger, 2007).

The Cape Town Open Education Declaration¹ contends that the OER movement is based on *"the belief that everyone should have the freedom to use, customize, improve and redistribute educational resources without constraint."* It proposed three strategies to removing current barriers to the use of OER: (i) teacher and learner engagement with OER; (ii) general policy to publish openly; and (iii) commitment to open approaches at institutional and government levels.

Another definition is by McAndrew, Santos et al. (2009, as cited in Camilleri et al. 2014) who argue that educational resources are largely digital assets (music, images, words, animations) put together in a logical structure by a course developer who has attached an open license to it. In other words, the content is openly available (it can readily be found or discovered), is openly accessible (it is in a form which allows others to take it away) and openly reusable (the user can easily modify it and is allowed under the license to do certain things with it without having to ask the creator's permission first).

Showing how the scope of OER definitions differ, Camilleri, Ehlers, and Pawlowski (2014) present another definition by Pirkkalainen & Pawlowski (2010) who see OER as *"Any digital resource, which can be freely accessed and used for educational purposes."* This broad definition includes a lot of different objects, such as digital learning resources, software tools like wikis or authoring systems, simulations or animations, electronic textbooks, and also lesson plans or records of shared experiences. They identify parallels to other "openness initiatives" such as (1) learning resources, (2) articles, textbooks and digital equivalents (Open Access), (3) software tools (Open Source), instructional or didactical designs and experiences (Open Educational Practices) and (4) web assets.

¹ <http://www.capetowndeclaration.org/>

Conole and McAndrew (2010) provide the following definitions to clarify the distinctions between the various terms used:

- A learning object can range from a simple digital asset (such as a piece of text or an audio file) through to a more complex learning resource incorporating a range of media and designed to support a particular learning activity.
- Open Educational Resources (OER) are teaching and learning materials made freely available for use and repurposing by teachers and learners. The term is potentially synergistic with learning objects; the emphasis is on the open license allowing the use and reuse of the resources.
- A learning activity consists of a set of tasks a learner undertakes, either individually or in a group, using a specific set of resources (which may include tools) to achieve a set of intended learning outcomes.
- Learning design is a research area that develops methods, tools and resources to support teachers in making better pedagogically-informed use of technologies.
- Also worth noting is the related term “Open Courseware” (OCW), which means free and open digital publication of high quality educational materials, organized as courses.

According to Camilleri, Ehlers, and Pawlowski (2014, p.8), the above definitions expose some of the tensions that exist with OER:

- Nature of the resource: Several of the definitions above limit the definition of OER to digital resources, while others consider that any educational resource can be included in the definition.
- Source of the resource: While some of the definitions require a resource to be produced with an explicit educational aim in mind, others broaden this to include any resource, which may potentially be used for learning.
- Level of openness: Most definitions require that a resource be placed in the public domain. Others require for use to be granted merely for educational purposes, or exclude commercial uses.

They note however, that despite these tensions, these definitions also share some common features including:

- cover both use and reuse, repurposing, and modification of the resources;
- include free use for educational purposes by teachers and learners;
- encompass all types of digital media.

Camilleri, Ehlers, and Pawlowski (2014) recount that the term “Open Access” (OA) is now widely used in at least two senses. For some, “OA” literature is digital, online, and free of charge. It removes price

barriers but not permission barriers. This nature of open access is often referred to as *gratis*. For others, “OA” literature is digital, online, free of charge, and free of unnecessary copyright and licensing restrictions. It removes both price barriers and permission barriers. It allows reuse rights which exceed fair use. This nature is referred to as *libre* (Vollmer, 2012).

The extent of *libre* can be expressed in terms of a Creative Commons license, which grants the licensor “a worldwide, royalty-free, non-exclusive, perpetual (for the duration of the applicable copyright) license to exercise the rights in the work as stated below:

- i.** to reproduce the work, to incorporate the work into one or more collections, and to reproduce the work as incorporated in the collections;
- ii.** to create and reproduce adaptations, provided that any such adaptation, including any translation in any medium, takes reasonable steps to clearly label, demarcate or otherwise identify that changes were made to the original work. For example, a translation could be marked “The original work was translated from English to Spanish,” or a modification could indicate “The original work has been modified”;
- iii.** to distribute and publicly perform the work, including those incorporated in collections; and,
- iv.** to distribute and publicly perform adaptations.

The above rights may be exercised in all media and formats, whether now known or hereafter devised. The above rights include the right to make such modifications as are technically necessary to exercise the rights in other media and formats.”

Within the context of the definitions presented above, Camilleri, Ehlers, and Pawlowski (2014) suggest that a resource must be both *gratis* and *libre* to be considered an OER. The entries in this report do not all completely conform to having the aspects of both *gratis* and *libre* and may just have one. The OER movement is still an emerging concept in Kenya where the level of awareness and adoption of OER are still just evolving. Tied to this is the level of maturity with regard to the ICT infrastructure and ICT integration in education and the level of affordances these offer for the OER movement to take root. Nonetheless, the initiatives described in this report do all have some aspects of openness that can be identified as building blocks along the OER continuum with aspects that can be located in the range of definitions discussed in this section.



Chapter I.
Kenya National Policies
and Strategies in ICT,
ICT in Education, and OER

This chapter provides an overview of Kenya's national policies and strategies in ICT and ICT in Education. It contains the description of various government level initiatives (in collaboration with UNESCO and COL) with respect to OER adoption as well as the beginning of a process to develop a national OER policy.

National ICT Policies

Kenya's first National ICT Policy was developed in 2006. The vision outlined in the policy document was one of a prosperous ICT-driven society. The mission was to improve the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services (MIC Kenya 2006, ICT Authority 2014). The policy was guided by the need for infrastructure development, human resource development, stakeholder participation and an appropriate policy and regulatory framework. The focus areas included information technology, broadcasting, telecommunications, postal services, radio frequency spectrum, universal access to ICT and an institutional framework for implementation (ICT Authority 2014). However, since the first ICT policy of 2006, and following global trends generally, there have been significant ICT developments taking place in Kenya. Additionally there have been major political and socio-economic changes including a new Constitution that was promulgated in 2010 and the government's blueprint for development, Vision 2030. These developments all have significant implications for the role of ICT in the Kenyan society.

The Kenya Vision 2030 is the national long-term development blueprint that aims to transform the country into a modern, globally competitive, middle-income country offering a high quality of life for all citizens by the year 2030. It is guided by a Vision of "a globally competitive and prosperous nation with a high quality of life by 2030" with the overall theme of "transforming Kenya: pathway to devolution, socio-economic development, equity and national unity." The ICT theme outlined in Vision 2030 is "strengthening the foundation for a knowledge-based economy" (ICT Authority 2014, p.12).

A more recent document that outlines some of the government's strategies for the development of ICT is the Kenya ICT Master Plan (ICT Authority 2014). Guided by Vision 2030, the vision outlined in the ICT Master Plan is "Kenya as an ICT hub and a globally competitive digital economy" (Ibid, p.39). The objectives and strategies in the Master Plan are presented around three foundations and three pillars. The foundations are:

- ICT human capital and workforce development: The development of a critical mass of quality ICT human capital is a prerequisite to the development of a viable ICT sector.
- Integrated ICT infrastructure that seeks to provide the integrated infrastructure backbone required to enable cost effective delivery of ICT products and services to Kenyans, businesses and other stakeholders.

- Integrated information infrastructure with the focus of providing more and better information from the public sector, to ensure that there is maximum access to information held by public authorities to all Kenyans and that public information is readily available through consolidated portals in an affordable and secure way.

The foundations are described as the critical actions that need to be undertaken in order to lay the basis for Kenya's transition to a Knowledge Society and position the country as a regional ICT hub.

As the discussion above shows, there are a number of plans and strategies underway to develop the ICT sector in Kenya that would support the development in other sectors, notably education for this study. The technological, political and socio-economic developments since the 2006 National Policy will all need to be taken into consideration in the development of an updated National ICT Policy. In the interim the Kenya National ICT Master Plan lays out the vision and mission for the development of ICT in the country. Some of the targets that focus on education that are highlighted in the ICT Master Plan include:

- 100 percent integration of ICT in teacher education in all teacher training institutions and universities; and
- availability of locally relevant multimedia content for use in primary and secondary schools that would be accessible through a regulated national educational portal.

The next section looks at national policies with respect to ICT and Education.

ICT in Education Policies

Government orientation and policies with regard to ICT in education is discussed at length in the Ministry of Education, Science and Technology Sessional Paper No. 14 of 2012 (MOEST 2012). It is noted that the focus of ICT in Education over the last 10 years in Kenya has been mainly on e-government and ICT skills development primarily at the secondary school and university levels. Some of the challenges highlighted in efforts to introduce ICT in Kenya include access, funding, inadequate ICT facilities and the high cost of developing interactive e-learning content. In addition, ICT are yet to be embraced for instructional purposes or as a tool for management because teachers do not have required competencies. Inadequate capacity for maintaining ICT equipment, as well as the frequent changes or updates to ICT technology, also makes regular acquisition and maintenance of ICT unaffordable.

Another notable challenge to ICT provision, especially in rural areas is the limited access to electricity and, where this exists, frequent power disruptions. Further, high costs of Internet provision and other costs associated with ICT equipment, infrastructure and support costs have been an obstacle to rolling out a national ICT programme in the medium term (MOEST 2012). Despite these challenges,

it is acknowledged that there have been some improvements in certain aspects such as the wider distribution of internet provision and reducing costs of digital equipment.

To address these challenges and achieve the objectives of educational transformation for the envisaged knowledge society, an action plan is outlined in Sessional Paper 14 (MOEST 2012, p. 57). This asserts that government policies will:

1. Regard the funding and provision of ICT in education in all respects as a national development priority.
2. Lay greater emphasis on ICT integration to improve teaching and learning while continuing to support ICT for educational administration and management (e-government) and development of digital literacy skills relevant to the knowledge economy.
3. Link investments in ICT at all levels in the education sector to key education objectives to ensure that school leavers and college graduates have the necessary skills to contribute to the development of a modern competitive knowledge-based economy by 2030.
4. Invest in appropriate ICT infrastructure, systems and human capacity development across all county and sub-county offices, in line with government devolution, to ensure results-based financing and real-time information sharing for effective administration and management of the education system.
5. Ensure that ICT will be used to address gender equality through providing universal access to education at all levels.
6. Ensure that ICT will be incorporated in the education of children with special educational needs.

These policies will be implemented across different levels and aspects of the education sector. Some of the categories of focus are highlighted below with more specific strategies under each category. The categories include: leadership and management, professional development, curriculum and assessment, ICT infrastructure and deployment; and open, distance and e-learning.

Leadership and management — (i) Establish a National ICT in Education Centre (ICTEC) with a board representing all stakeholders to drive forward ICT deployment and use across the education sector; (ii) the allocation of specific and adequate budget items each year for ICT in education; (iii) the establishment of a robust monitoring and evaluation system; and (iv) to promote research on ICT in education.

Professional Development — (i) Ensure that school managers and education managers at school, county and national level have the required skills for ICT leadership across all the levels of education; (ii) ensure that new and existing teachers and teacher educators are equipped with the relevant ICT skills, knowledge and competencies for effective teaching and learning on a continuing basis;

(iii) ensure that all teachers and teacher educators at all levels of the education system are facilitated to acquire their own ICT equipment under a one-device per teacher policy; (iv) review the teacher training curriculum at pre-service, in-service and at all levels to ensure that ICT are integrated across the curriculum.

Curriculum and Assessment — (i) Ensure that there is an accreditation and recognition system of ICT skills acquisition in education and training; (ii) enhance the curriculum and introduce 21st century skills and digital literacy across the curriculum for all levels of the education system.

ICT Infrastructure and Deployment — (i) Develop guidelines and a statement of minimum quality standards and specifications for ICT hardware, online resources and other appropriate software; (ii) develop an internet safety and security policy to guide access to digital materials, open educational resources, the internet and the use of ICT; (iii) collaborate with other ministries and stakeholders to review national telecommunication policies with a view to ensuring that internet service providers agree to preferential rates for broadband internet services to schools and educational and training institutions as their contribution to education; (iv) collaborate with relevant ministries to ensure that the companies contracted to lay fibre in and between all major urban areas should be routed close to schools and educational institutions so as to facilitate cheap and easy connections; (vii) collaborate with relevant ministries and service providers to ensure that electricity, broadband internet connectivity and appropriate ICT equipment is in place by 2020. All education institutions should have access to broadband internet to allow e-learning to take place.

Open, Distance and e-Learning (ODeL) — Sessional Paper 14 of 2012 describes the possibilities that open, distance and e-learning offer to expanding access, quality and equity to education and that it can help address the demands on education as stipulated in the Constitution (2010) of Kenya and the aspirations of the Kenya Vision 2030. It is noted that open and distance learning can provide access to education to otherwise marginalized and hard-to-reach populations, and those who are employed and are unable to attend face-to-face classes. The following obstacles to accessing conventional education are highlighted: migration and nomadic lifestyles, poor transportation systems, and limited opportunities in the mainstream education sector. Thus open and distance learning is considered a viable alternative.

To address these challenges, it is noted in the Sessional Paper 14 (MOEST 2012) that the Government will adopt open and distance learning approaches including home learning across all levels of education in Kenya. The strategies to be used by the government to implement open and distance learning include: (i) the development and implementation of an overall ODL policy; (ii) mainstreaming ODL in the education system (iii) the development of a regulatory and legal framework to enable institutions establish open learning opportunities; (iv) the establishment of partnerships with ODL providers at national and international levels; (v) the establishment of an ODL broadcasting station, possibly at the proposed National ICT in Education Centre (ICTEC) for the purpose of transmitting ODL programs to all areas of the country; and (vi) enhance the development and dissemination of educational content at the curriculum development center (*Ibid.*, p. 63).

The document further goes on to provide a detailed outline of how ICT will be integrated at each level to meet the needs of each of the following segments of learners: early childhood; primary and secondary; adult and continuing education; technical, industrial, vocational and entrepreneurship training (TIVET), special needs learners; and marginalized and vulnerable groups.

Currently, one of the flagship projects of the government is the schools laptop project. The project, which seeks to provide laptops as teaching and learning tools for pupils entering standard one (first grade), is currently being piloted (Oduor 2015). In the ICT Master Plan, it is noted that this project must be accompanied by a review of the school curriculum, the conversion of courseware into digital form, ICT training for teachers; and broadband internet connectivity to schools.

The government is also exploring the establishment of a National Open University as indicated in the following government gazette notification:

It is notified for the information of the general public that the Cabinet Secretary for Education, Science and Technology has, for the purpose of improving access to university education, established a Task Force on the establishment of a National Open University to offer university programs through distance and e-learning mode.

Gazette Notice No. 398⁸, Ministry for Education, Science and Technology Establishment of the Taskforce on Open University (2014).

The discussion above has highlighted the government's and more specifically the Ministry of Education's objectives, strategies and policies as far as harnessing ICT across every level of the education sector — for teaching and learning, access to instruction and resources, for professional development, for management and so on — is concerned. Open and distance learning are an important aspect of this strategy and there is mention of OER in Sessional Paper 14 of 2012.

Government Level OER Initiatives

To date, it appears that most of the Kenya government initiatives in OER have been undertaken through collaborative engagements with the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Commonwealth of Learning (COL). The quote below is extracted from a speech by Joseph Tiampati, Principal Secretary, Ministry of Information and Communication Technology of Kenya, during the launch of the School of Open Africa, Kenya.

Kenya is a signatory to the UNESCO's 2012 Paris Declaration on Open Education Resources licensed under Creative Commons open licenses. The use of open education resources improves the quality of teaching and learning, including by accelerating student comprehension and by providing more opportunities for the realization of universal access to education.

(October 2014, <http://www.information.go.ke/>).

Both COL and UNESCO are guided by the framework laid out in the Paris OER Declaration, which outlines the mechanisms through which ICT can be integrated with education to enhance quality and access to education for all. The following discussion provides an overview of the recent activities of UNESCO and COL to support OER integration toward the realization of quality and access to education in Kenya.

Kenya is one of the countries that participated in the inception meeting of the “Implementing the Paris OER Declaration” project that took place in March 2013 at UNESCO Headquarters in Paris. The meeting brought together representatives of four partner countries, OER experts, and UNESCO specialists to discuss the modalities of the project and agreed on the schedule of activities. With financial support from the Hewlett Foundation, the aim of the project was to assist member states in: (i) developing national-level OER policies, and (ii) implementing the UNESCO ICT Competency Framework for Teachers (ICT CFT) by harnessing OER (UNESCO 2013).

On June 6-7, 2013, the Kenya Ministry of Education together with COL hosted a two-day regional and national symposium on OER with funding support from the Hewlett Foundation. Promoting Open Educational Resources (OER) was the theme of the symposium, which brought together educational leaders and policy makers from 10 countries to consider the strategic opportunities for OER in the region and to explore policy enablers and practices for harnessing the potential of open education approaches for the benefit of the formal education sector in Kenya and the region. Participants at the symposium developed proposals for action. The Kenya Ministry of Education proposal for action included (i) developing policy guidelines for OER in education and training with reference to existing education policy; (ii) sensitizing stakeholders and build capacity; and (iii) developing OER institutional policies for open schools (COL 2013). Speeches by COL experts and the Kenya Ministry of Education representative made reference to adopting the UNESCO 2012 OER Paris Declaration as the guiding document for promoting and implementing OER policies and initiatives.

Kenya was the first country to hold a National Implementation Strategy Workshop on OER guided by the ICT Competency Framework for Teachers (CFT) Toolkit developed by UNESCO, COL, Microsoft and other partner institutions (UN Kenya 2013). The workshop held on June 19-20, 2013 was focused on the potential of the ICT CFT to transform the Kenyan teaching force into a technology literate and innovative workforce, in line with the country’s national plan — Vision 2030. On February 10-11, 2015, UNESCO and the Teachers’ Service Commission (TSC) conducted a face-to-face training on knowledge deepening in ICT for teachers in Nairobi, Kenya. This was followed by a 12-week online course (UNESCO). The training was attended by fifty master trainers drawn from all the 47 counties and included two special-needs teachers.

Another organization that has been engaged in the various government level seminars and workshops is Creative Commons. Creative Commons (CC) is a nonprofit organization that enables the sharing and use of creativity and knowledge through free legal tools. Kenya became a CC affiliate

in 2012. Alex Gakuru, the regional coordinator for Creative Commons Africa is based Nairobi, Kenya. The organization works in Africa to:

- Create awareness about Creative Commons licensing and promote open access on the continent particularly focusing on education and development;
- Consult individuals wanting to use Creative Commons;
- Facilitate meetings and other events aimed at fostering collaboration and exchange between the participating groups;
- Raise funds for transnational activities like studies, surveys and networking initiatives.

The organization has brought the School of Open to the region and, among other projects, had planned to translate CC licenses into the local language. As stated on the website of CC Kenya, joining as an affiliate has now made East Africa one of the most active regions for CC in Africa with affiliate teams in Rwanda, Tanzania and Uganda.

An example of Creative Commons Kenya collaboration is their participation in the UNESCO two-day regional seminar in Nairobi, Kenya to further the development and implementation of OER policies for Kenya, Ghana, Ethiopia, Madagascar, Ethiopia and Djibouti. Participants were taken through procedures on acquiring open licenses by the expert from Creative Commons Africa who explained the role that Creative Commons plays in ensuring open access to educational resources. The expert also talked about the School of Open Africa, an initiative that seeks to provide a transformative model of learning (see chapter 2).



Figure 1. Creative Commons logo (left);
Kenyan Creative Commons logo (right) (Source: <https://twitter.com/cckkenya>)

Toward the Development of a National OER Policy

Sessional Paper 14 of 2012, the ICT in Education Policy, and the National ICT Master Plan discussed in the previous sections were all part of the deliberations of a two-day workshop that was held on 28-29 January 2014 in Nairobi, Kenya. UNESCO and the Kenya Ministry of Education organized the workshop to draft the *Policy on Open Educational Resources for Achieving High-Quality Education for All*. The objectives of the two-day workshop were to:

- raise awareness on harnessing potentials of OER policies in Kenya;
- facilitate the understanding of OER within existing ICT and education policy documents;
- draft a new OER policy statement that is aligned with:
 - the Sessional Paper No 14 of 2012: Reforming Education and Training Sectors in Kenya in particular chapter 7 on ICT and Open and Distance Learning in Education and Training,
 - (updated) ICT Strategy of the Ministry of Education, and
 - (updated) National ICT Master Plan of the Ministry of ICT

Engagement and presentations from the following actors are highlighted in the report (UNESCO 2014) of the workshop:

- Mr Abel Caine, UNESCO Programme Specialist for Open Educational Resources, and Mr Jaco Du Toit, Adviser for Communication and Information at the UNESCO Nairobi, presented the UNESCO OER Programme highlighting the Paris OER Declaration and the UNESCO — Hewlett OER Project to develop national-level OER policies in five countries, including Kenya, by 2014.
- Mr Alex Gakuru, Creative Commons Africa, presented the national legal framework for intellectual property rights highlighting many relevant provisions from the Constitution promulgated in 2010.
- Mr Kwame Shiroya, ICT Authority, presented the scope and schedule for the new National ICT Master Plan due to be implemented by June 2014.
- Ms Cecilia Wakahiu, Kenya Ministry of Education ICT Directorate, presented the existing 2006 ICT in Education Plan, the 2012 Sessional Paper on Education, and the new areas to be included in the revised ICT in Education Plan.

The UNESCO (2014) report of the workshop notes that it resulted in the development of a comprehensive draft National OER Policy that focused on key entry points aligned to the Sessional Paper No 14 including: intellectual property rights and licensing; leadership and management; skills and knowledge for policy advisors; quality assurance policy guidelines; professional development; curriculum and assessment; ICT infrastructure and deployment; and marginalized and vulnerable groups.

The OER Policy Committee deliberated on the draft and formulated a Work Plan with time-frames and further actions until the Policy is officially approved by the Kenya Minister of Education. Shelmith Wanjohi, the lead coordinator for the OER Policy Committee observed that “within the new Kenya Constitution and Kenya Vision 2030, the OER Policy will set a clear path for using OER to achieve universal access to high-quality education for all Kenyans” (UNESCO 2014).

The workshop described above outlines a concerted and collaborative effort to develop a National OER Policy for Kenya. Various actors from the Ministry of Education, Ministry of ICT, UNESCO, and Creative Commons came together to draft the policy. This high-level consultation on developing a National OER policy points to the government of Kenya commitment to harness ICT and OER to achieve development goals in the education sector and the Kenyan society at large. At the time of this study, it was yet to be confirmed if the policy has been finalized. Nonetheless, there are a number of government-level initiatives that have been ongoing that appear focused on realizing the integration of ICT and OER in education.

Kenya’s commitment to ICT integration and the application in education is highlighted by the various activities and initiative presented in this section. UNESCO and COL in particular have played an continue to play an important role by working with the Ministry of Education, Science and Technology and other educational organizations such as the Teacher Service Commission and the Kenya Institute of Curriculum Development on the design of Open Educational Resources and ICT integration in education.

As indicated in the opening address above by the Principal Secretary Ministry of Education, Kenya is a signatory to the OER Paris Declaration, the work of both UNESCO and COL are guided by the Declaration. The Declaration that makes ten recommendations is accessible at the UNESCO website (http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/Events/Paris%20OER%20Declaration_01.pdf):

1. Foster awareness and use of OER
2. Facilitate enabling environments for use of Information and Communications Technologies (ICT)
3. Reinforce the development of strategies and policies on OER
4. Promote the understanding and use of open licensing frameworks
5. Support capacity building for the sustainable development of quality learning materials
6. Foster strategic alliances for OER
7. Encourage the development and adaptation of OER in a variety of languages and cultural contexts
8. Encourage research on OER
9. Facilitate finding, retrieving and sharing of OER
10. Encourage the open licensing of educational materials produced with public funds

The background features a repeating pattern of white, wavy lines on a light green background. In the upper left, a large green circle contains a white 'o'. Below it, a red circle contains a white 'e', and further down, a green circle contains a white 'r'. These letters are connected by a series of thin, white, curved lines that flow downwards. Scattered throughout the page are several small, stylized illustrations of buildings in shades of brown and grey. The text 'Chapter 2. International OER Initiatives in Kenya' is centered in a green, sans-serif font.

Chapter 2. International OER Initiatives in Kenya

Chapter two describes various international and regional OER initiatives in Kenya. These cover teacher education, agriculture, secondary education and non-formal programmes. The chapter describes the AVU teacher education OER modules and repository, the TESSA initiative and the OER Africa initiative. Also described is the School of Open Africa initiative coordinated by Creative Commons (CC) and the Peer 2 Peer University (P2PU) — a peer learning community for developing and running free online courses, the Commonwealth of Learning collaboration with TIVETs in Kenya to deliver non-formal programmes.

The AVU Teacher Education OER Initiative

The African Virtual University (AVU) is a pan-African intergovernmental organization established by charter with the mandate to significantly increase access to quality higher education and training through the innovative use of information and communication technologies (ICT). The AVU has its headquarters in Nairobi, Kenya and a regional office in Senegal.



Figure 2. The AVU OER repository start page <http://oer.avu.org/>

The AVU currently hosts an OER repository that holds a total of 219 modules. These modules were developed during the AVU Phase 1 (2005-2011) Multinational Support Project that was implemented in 12 African universities across ten Anglophone, Francophone and Lusophone countries. In Kenya, University of Nairobi was one of the twelve universities. The other institutions were Jimma University in Ethiopia; Université d'Antananarivo in Madagascar; Universidade Pedagógica in Mozambique; Université Cheikh Anta Diop (UCAD) in Senegal; Amoud University, University of Hargeisa and East Africa University in Somalia; Open University of Tanzania; Kyambogo University in Uganda; University of Zambia; and University of Zimbabwe.

In this project, an ICT-integrated teacher education curriculum in Math and Science was developed. 73 courses modules were designed, authored, and peer-reviewed. 146 authors and peer reviewers from the 12 African Universities directly participated and collaborated with the AVU in the development and implementation of the modules for the teacher education project.

The breakdown of the 73 modules was as follows: 46 in Mathematics and Sciences; 4 in ICT Basic Skills; 19 in Teacher Education professional courses; and 4 in integration of ICT in Education. The modules were translated making them available in English, French and Portuguese leading to a total of 219 modules that were released under a Creative Commons License. These modules were produced as textbooks and made available in both print form and digital forms. The AVU@OER portal was launched in January 2011 and currently the modules can be accessed freely online.

Background to the creation of the AVU OER

The objectives for developing the teacher education programs were: (a) to improve the quality of teaching and learning in schools through the use of ICT; (b) to increase the number of mathematics, science and ICT basic skills teachers; and (c) to promote regional integration, as well as to strengthen relevant partnerships with other teacher education initiatives in Africa (Diallo, Thuo & Wright 2011). Each phase of development and production began with a workshop. The process kicked off with the AVU convening a policy and curriculum conceptualization workshop. The objectives of the workshop were to ensure that the programme was well conceptualized and addressed the needs of all the participating countries and institutions.

The curriculum design process was a collaborative effort and included subject matter experts from the partner institutions and ICT in education experts. Through a curriculum mapping process, the mathematics, chemistry, physics, biology, and teaching curricula were analyzed and harmonized for all 12 universities, recommendations for developing open distance and e-learning modules were drafted, common thematic areas in the curriculum of the 12 universities from the 10 countries were identified. It was discussed how ICT would be used in the teaching and learning of mathematics, chemistry, physics, biology and teacher education. The following items were established as a result of the curriculum conceptualization deliberations: (i) learning objectives; (ii) learning outcomes; (iii) assessment strategy; (iv) learner support requirements, and (v) a quality assurance framework (Ibid.).

A needs analysis was done for ICT integration in teaching and learning of mathematics, chemistry, physics, biology and teacher education. Basic ICT competences needed by the teachers were identified and recommendations for an appropriate in-service and pre-service teachers' curriculum were drafted. The content authoring process was facilitated by ICT integration in education experts. Subject matter experts were trained in the skills of identifying and presenting e-learning content. A template was provided for the subject matter experts to insert subject matter, learning activities, assessment activities and references. A gender expert was on hand to ensure the materials were gender-sensitive. After the textbooks were drafted, they were submitted to a peer review process: a reviewer could not have been employed by the institution that developed a textbook. The modules were sent to a materials development coordinator who worked with a team of editors, instructional designers and graphic designers to produce the final modules (Ibid.).

Keeping in mind that learners have varied access to the Internet including those with limited or no access at all, the OER were produced and delivered in various formats, to ensure that they were widely accessible. In addition to being accessible in the AVU online repository, the materials were produced as printed booklets and DVDs, they were also uploaded onto the open source learning management system (LMS) Moodle. The main LMS was located at AVU and the LMS was installed on mirror servers at each participating institution. Thus, the materials were accessible through the Intranet of these institutions. The materials were also made available in digital video discs (DVDs) and as printed books. Short introductory videos of each module were also uploaded to the repository.

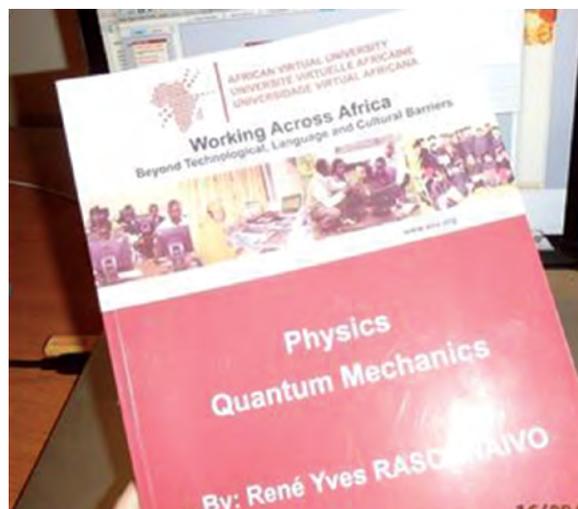


Figure 3. AVU OER Module in Print

The original 73 modules were written in the language of the subject matter experts — English, French and Portuguese. The materials were then translated each into the two other languages, hence the 219 modules. The content was developed as open education resources with the authors signing the Creative Commons Agreement to this effect and the modules were released under a CC-BY-SA license.

AVU OER repository visits by top ten countries

Top Ten Visits per Country 2011-2015		
Country	%Visits	Total
1 United States	22%	542,508
2 Brazil	13%	328,028
3 India	8.10%	204,387
4 Philippines	5.52%	139,286
5 (not Set)	4%	98,408
5 Kenya	4%	89,072
6 Canada	2.47%	62,325
8 Nigeria	2.41%	60,811
9 Pakistan	2.30%	58,036
10 France	2%	50,466

Top Ten Visits in Africa 2011 –2015		
Country	%Visits	Total
1 Kenya	3.5%	89,072
2 Nigeria	2.4%	60,811
3 South Africa	1.3%	31,541
4 Tanzania	1.1%	10,481
5 Morocco	1.1%	26,999
6 Algeria	1.0%	26,242
7 Mozambique	0.8%	19,177
8 Cameroon	0.7%	18,168
9 Ghana	0.7%	17,158
10 Ethiopia	0.7%	16,906

The AVU OER have received the following recognitions:

- 2011 — Best Emerging Initiative in the first Open Courseware (OCW) People's Choice Awards
- 2012 — Most Progressive Resource
- 2013 — ACE Text-Based Award (Outstanding Course/Text and Illustrations — Atomic Physics) — Open Courseware Consortium



Figure 4.

Currently, the AVU is implementing Phase II (2012-2016) of the AfDB-funded multinational Support Project. This project builds on the first phase with the benefits being extended to more countries. The overall objective of the AVU Multinational Project II is to strengthen the capacity of the AVU and a network of 27 institutions to deliver and manage quality ICT-integrated education and training opportunities in 21 African countries. The project has the following activities: (1) Establishment of new Open Distance and e-Learning (ODeL) Centers and/or upgrading of exiting AVU Learning Centers as well as Internet connectivity provision at AVU Partner Institutions; (2) Development and/or improvement, and delivery of four ICT integrated Programs: AVU Capacity Enhancement Program (ACEP); Teacher Education (TE), Computer Science (CS), and Peace and Conflict Resolution; (3) Gender Mainstreaming, (4) Research and Development; (5) Promotion and development of Open Educational Resources (OER); and (6) Enhancement of AVU Capacity .

The AVU has recently established an Open Access journal and its international conferences (two so far) have attracted submissions and workshops on OER. Currently being developed in Phase II and will be released as OER are modules in Applied Computer Science, ODeL Professional Development, while the Teacher Education modules are being updated. Also, the AVU has delivered a Peace Management and Conflict Resolution self-study programme as a MOOC. In Kenya Phase II is being implemented in partnership with Egerton University and Kenyatta University. The AVU is also continuing its partnership with University of Nairobi through various activities.

The TESSA OER Initiative

Teacher Education in Sub-Saharan Africa (TESSA) is a network of teachers and teacher educators working alongside the Open University, UK to improve the quality of classroom practice and access to teacher education resources across sub-Saharan Africa. It does this through offering a range of Open Educational Resources (OER) to support school-based teacher education. It is a global consortium that includes organizations like the BBC World Service Trust, the Commonwealth of Learning, and the South African Institute for Distance Education (SAIDE), but it is focused on the needs of teacher education in nine African countries. The initiative was launched with thirteen African universities as core members with plans to expand to more countries and institutions.

The TESSA OER is included in this report because Kenya is one of the original nine countries in the TESSA initiative through the involvement of Egerton University as one of the core member institutions (see chapter 3 on Egerton University for an example of how the TESSA OER were used for continuous professional development). The other African countries include Ghana, Nigeria, Rwanda, South Africa, Sudan, Tanzania, Uganda and Zambia. The primary funding for the TESSA initiative has come from the Allan and Nesta Ferguson Charitable Trust and the William and Flora Hewlett Foundation.

The TESSA OER includes a core set of 75 study units in Science, Literacy, Mathematics, Social Studies and the Arts, and Lifeskills (Wolfenden et al. 2010), and have been made available in four languages

(Arabic, English, French and Kiswahili) on the TESSA website (<http://www.tessafrica.net>) for download, on CDs, and on university intranets. The OER have been adapted and localized for different cultural and linguistic contexts and provided in nine local country versions (Ibid.).

Wolfenden notes that the TESSA OER initiative is unique in being audience specific to teachers in which the end user, the teacher educator, has been placed at the center of the initiative. The vast majority of the OER have been created collaboratively by teacher educators from across Africa (over 100 authors have been involved). The development of both the materials and the portal has involved extensive consultation with potential user groups building on local knowledge, materials and approaches (Ibid.).

TESSA Contact us

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Teacher Education in Sub-Saharan Africa (TESSA)

Welcome to TESSA

TESSA is a network of teachers and teacher educators working alongside The Open University, UK, to improve the quality of classroom practice and access to teacher education resources across sub-Saharan Africa. It does this through offering a range of Open Educational Resources (OER) in four languages to support school-based teacher education: English, French, Swahili (Tanzania) and Arabic (Sudan).

Choose country ...

- Pan Africa – Arabic
- Pan Africa – English
- Pan Africa – French
- Pan Africa – Swahili
- Angola

What is available....

Subject resources
Activities, case studies and resources for teachers to use in their classrooms with their students. The resources cover the primary curriculum (literacy, numeracy, science, life skills and social studies and the arts), as well as secondary science.

Audio resources
A set of short audio clips demonstrating a range of teaching approaches in African primary school classrooms.

Key resources
Resources that provide practical advice about a range of teaching approaches. They are suitable for primary and secondary teachers, and for teacher educators designing learning experiences for pre-service or in-service teachers.

Handbooks
These provide support for teachers and teacher educators. They include resources to support teachers working with pupils, teacher educators working with teachers, teaching practice supervisors and teacher educators working with secondary science.

Figure 5. TESSA start page (<http://www.tessafrica.net>)

Authorship: The TESSA resources are collaboratively created. No authorship is attributed because each study section has been developed by several colleagues in its original version and localization for use. Wolfenden notes that this collegial approach is central to the quality assurance process, and has ensured that the need for collective originality and quality rather than individual authorship is at the center of the creation process. She contends that while in other contexts individual attributions might be significant for the quest for professionally relevant, practice focused resources and courses, the collective in this instance seems to have a priority if high quality levels are to be sustained (ibid).

According to Wolfenden (2008), the TESSA initiative draws a distinction in the design and delivery approach from the initial OER providers that followed in the footsteps of MIT, where since, over a hundred universities have produced Open CourseWare offerings. These projects tend to be characterized by the one directional flow of course support materials (syllabi, assignments, reading lists, calendars, simulations, video lectures and lecture notes) usually derived from traditional face-to-face courses at that institution. Wolfenden notes that in the TESSA project, *“colleagues across the partner institutions have not been seen as consumers of imported educational material but rather as collaborators in content production, distribution and utilization. Awareness of the current situation in these institutions together with likely short and medium term contexts for exploitation has been at the center of TESSA OER development”* (Ibid., p. 7).

OER Africa

OER Africa is another initiative that is headquartered in Nairobi, Kenya. The initiative was established by the South African Institute for Distance Education (SAIDE) to drive the development and use of Open Educational Resources (OER) across all education sectors on the African continent.



Figure 6. OER Africa website (<http://www.oerafrica.org/>)

OER Africa was established with the belief that OER has a powerful positive role to play in developing and providing capacity for higher education systems and institutions across Africa in the following ways:

- Increase the availability of relevant, need-targeted learning materials and support more productive learners and educators;
- Reduce the cost of access to educational materials by removing copying restrictions;
- Encourage educator participation in relevant course design through adapting or developing materials for learning programs that are pertinent to African contexts and learners;
- Encourage educator and learner participation in relevant course delivery through the use of appropriate technologies and acquisition of the skills necessary to move away from lecture-based teaching; and
- Build capacity for learning through collaborative partnerships and communities of practice, both within and across educational systems and organizations.

This conviction is matched by the following concern: if the concept and practice of OER evolves predominantly outside and for Africa then — African higher education will not be able to liberate its potential for itself. Consequently, OER Africa initiative states that its vision as to promote vibrant and sustainable African education systems and institutions that play a critical role in building and sustaining African societies and economies through free and open development and sharing of common intellectual capital. It proposes to realize this vision by:

- Establishing dynamic networks of African OER practitioners through the sensitization and connection of like-minded educators — teachers, academics, trainers, and policy makers — to develop, share, and adapt OER to meet the education needs of African societies;
- Supporting African educators and learners to harness the power of OER through the creation and establishing and maintaining the networks of collaboration, both face-to-face and online; and
- Developing the capacity of African educators and learners as OER experts thus enabling them to join emerging global OER networks as active participants who can showcase Africa's intellectual property, not merely as passive consumers of knowledge produced elsewhere.

The premise of OER Africa is that it will facilitate the aggregation of information and human expertise that produces knowledge — an activity which can either be individual, or inter-institutional. According to the initiative, the focus of its partnerships with African institutions of higher education and projects are primarily, but not exclusively, on the thematic areas of teacher education, academic skills for higher education, agriculture, and health education. Overall, OER Africa has therefore been set up to ensure that the power of OER is harnessed by Africans for Africans by building collaborative

networks across the continent. To this end, OER Africa nurtures partnerships and collaboration with educational networks and institutions in Africa by offering them the following three main forms of support:

- i) Practical assistance in creating appropriate OER policies;
- ii) Development/adaptation of OER for educational programmes and courses; and
- iii) Provision of support to collaborative networks, for instance, by facilitating the design of collaborative projects, providing online tools for collaboration and sharing through the OER Africa website, or assisting networks with developing or enriching their own websites.

Seed funding for these activities have been provided by the William and Flora Hewlett Foundation, which has successfully supported the development of a number of similar open educational resources initiatives such as the MIT Open CourseWare in the United States (OER Africa website), as well as the Bill and Melinda Gates Foundation.

Over time, OER Africa has had to deal with the growing demands of students and faculty in Africa for quality pedagogical content, as well the demands of African societies for well-trained and competent higher education graduates. OER Africa asserts that, in view of the use of the innovative approach of integrating a Participatory Action Research (PAR)² agenda into each of its institutional partnerships and collaborations, the main objectives being to:

- create a more in-depth understanding of how OER practices can support transformation of teaching and learning;
- incorporate into policy and advocacy and also widely share knowledge of OER practices.

OER Africa further recognizes that sustainable adoptions of pedagogical practices that fully exploit the transformative educational potential of OER and ICT in higher education in Africa are inhibited by policy, regulatory, systemic, and cultural barriers in most institutions. To mitigate this, OER Africa has integrated the PAR agenda in its partnerships with four institutions in Africa with the belief that a more focused interaction with them will facilitate a more collaborative agenda. One of these institutions in Kenya is the Africa Nazarene University. Other examples are University of Pretoria (Onderstepoort UP, South Africa), Open University of Tanzania (OUT, Tanzania) and University of the Free State (UFS, South Africa). Thus, according to OER Africa, implementing a parallel PAR agenda in each of these institutions would make it possible to have a generalizable understanding of these institutional barriers and the potential strategies to overcome them. OER Africa proposes that this information can then be shared with key educational decision-makers in African higher education.

² PAR is used in this context by OER Africa as 'collaborative research, education and action used to gather information to use for change on social issues' (SAIDE, 2016)

Agriculture OER is one of the OER Africa initiatives that provides a comprehensive set of agricultural resources that are specific to African higher education. It does this by encouraging African universities and relevant non-governmental organizations in Africa to submit and share content. Currently, the Agriculture OER runs a project called AgShare which is a partnership between institutions. The AgShare project aims at influencing the focus of existing organizations in different sectors to create and openly share different types of OER that strengthen African MSc Agriculture curriculum and promote the use of the OER by other stakeholders.

AgShare uses a research-based approach for the co-creation, release and sharing of purposeful agricultural knowledge within and across stakeholder groups. The key components of its approach include:

- Field-based action research on farmers' practices and students needs;
- Participation of students, faculty and staff in capacity-building workshops, participatory action research, instructional design, OER and media production skills;
- Publication of student work that is done in three ways: as OER multimedia learning packages for incorporation into degree programs; as information for farmers that is used for follow-up visits and extension materials; as research in masters and PhD theses and undergraduate student research; and
- Release of OER in appropriate formats and their wide dissemination.

One example of an AgShare initiative is the United States International University (USIU) OER Agribusiness Management Modules for Farmer Organizations (see chapter 3).

Another example of an OER Africa collaboration with a Kenyan university is with the African Nazarene University (chapter 3).

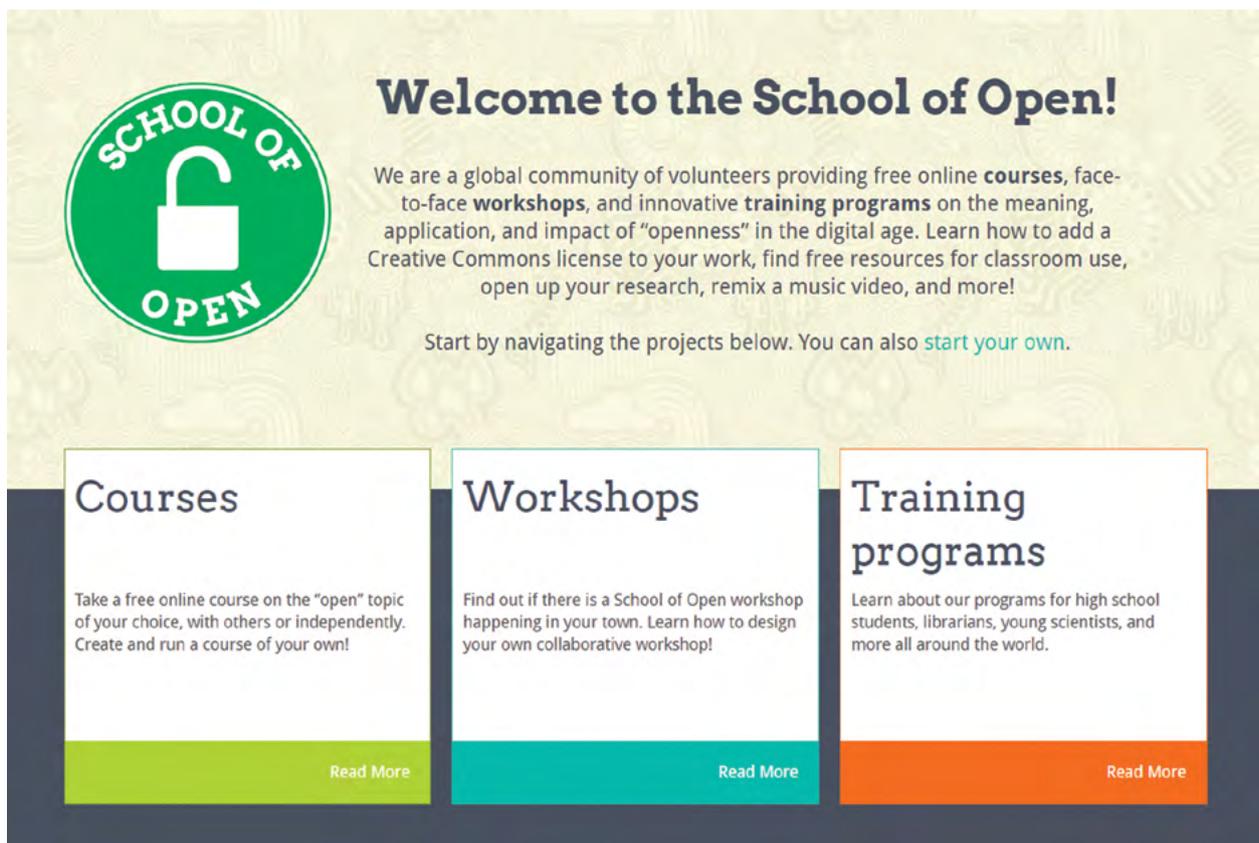
School of Open

School of Open Africa initiative is a community of volunteers from organizations and regions all over the world coordinated by Creative Commons (CC) and the Peer 2 Peer University (P2PU) — a peer learning community for developing and running free online courses — founded on three fundamental values and principles:

- Openness — The openness of School of Africa community ensures that everyone can participate, content is easily accessible and usable, the model and technology allow for experimentation and ongoing improvement, and processes are accountable to the community.

- Community — The governance of the initiative is based on a community-centric model in which volunteers drive all aspects of the project and members speak and act with civility, tolerance, and respect for other opinions, people, and perspectives.
- Peer learning — Everybody is a teacher and a learner at the same time.

School of Open Africa is inspired by the philosophy and belief that access to and participation in research, education, technology, and culture can vastly be improved by Open content, tools and processes. The initiative encourages peer learning on what “open” means and how to use open content, tools, and processes powered by peer mentors and learners, self-organized into courses, which themselves leverage existing “open” learning materials. Consequently, School of Open Africa courses and resources are licensed to the public under a Creative Commons Attribution-ShareAlike or more open license.



The image shows a landing page for the School of Open website. At the top left is a circular logo with a green background, a white padlock icon, and the text "SCHOOL OF OPEN" around the border. To the right of the logo is the heading "Welcome to the School of Open!" followed by a paragraph describing the community's mission. Below this is a line of text: "Start by navigating the projects below. You can also [start your own](#)." At the bottom, there are three white boxes with colored headers and footers. The first box is titled "Courses" and has a green footer with "Read More". The second box is titled "Workshops" and has a teal footer with "Read More". The third box is titled "Training programs" and has an orange footer with "Read More".

Welcome to the School of Open!

We are a global community of volunteers providing free online **courses**, face-to-face **workshops**, and innovative **training programs** on the meaning, application, and impact of “openness” in the digital age. Learn how to add a Creative Commons license to your work, find free resources for classroom use, open up your research, remix a music video, and more!

Start by navigating the projects below. You can also [start your own](#).

Courses	Workshops	Training programs
Take a free online course on the “open” topic of your choice, with others or independently. Create and run a course of your own!	Find out if there is a School of Open workshop happening in your town. Learn how to design your own collaborative workshop!	Learn about our programs for high school students, librarians, young scientists, and more all around the world.
Read More	Read More	Read More

Figure 7. School of Open website (<http://schoolofopen.p2pu.org/>)

The main goal of School of Open Africa and its community driven model of open education is to encourage everyone, including artists, educators, learners, and researchers, to improve their fields through the use of open content, tools, and processes, as well as provide opportunities to obtain skills and certification around open practices that result in improved access to and participation in research, education, technology and culture. Its focus is therefore on learning opportunities and certification that promote open practices of all kinds, especially in research, education and culture. "Open practices" here are identified as:

- use of the content, tools and processes shared with School of Open Africa;
- enabling others to use, share and adapt what School of Open Africa creates; and
- support for transparency in School of Open Africa's content, tools and processes.

School of Open Africa asserts that its courses must be built around tools that are accessible to any learner free of charge. The courses must also be free to share and free to modify to suit the learner's needs. Participants in the School of Open Africa initiative are therefore encouraged to share their work by openly licensing their work under the CC Attribution-ShareAlike, or compatible license, so that they may review, revise, and adapt each other's work.

During its launch in September 2014, School of Open Africa rolled out programmes in Tanzania, Nigeria, South Africa and Kenya. The following is a highlight of its launch in Kenya. The launch in Kenya took place on 22 October 2014. In attendance was the Principal Secretary in the Ministry of Information, Communications and Technology, Mr. Joseph Tiampati. He underscored the importance of OER in education when he asserted that they improve the quality of teaching and learning by accelerating student comprehension and by providing more opportunities for the realization of universal access to education (Tiampati 2014).

School of Open hosted 20 girls from Precious Blood Secondary School in Nairobi for the event. They explained that the goal was to work with the students to map out education as they experienced it in their school and figure out how best to incorporate Open Education in their learning. They further discussed Open Education in a little more detail by exploring the concept of the commons, copyright and copyleft and how the Creative Commons suite of licenses has enabled the Open Education movement globally. According to School of Open Africa, one of the themes that was borne out of this interaction was the need to get school administrations and teachers in Kenya to understand and make an investment in Open Education. They therefore decided to work with both groups (administrators and teachers) to encourage students to begin to demonstrate the value of Open Education by creating demand through: (i) consumption and integration of OER in learning; and (ii) creation and sharing of OER proactively with students from other schools.

The project seeks to expand to regions, in and beyond Africa, and has indicated that during the upcoming 2016 Mozilla Festival it will map out its programmes from around the world and hone in

on areas with maximum potential for impact where it can “train the trainers” or otherwise empower student and educator communities to start up programs for themselves.

Commonwealth of Learning in Kenya

This study found the following examples of OER developed by Technical and Vocational Education Training and Education (TVET) Institutions in Kenya. The Commonwealth of Learning (COL), in partnership with a number of Kenyan TVET institutions, developed various non-formal community training courses through the Innovation in Vocational Education and Skills Training (INVEST Africa) Program of COL's Technical and Vocational Skills Development (TVSD) Initiative (COL website).

Course authors from the following Kenyan TVET institutions (Coast Institute of Technology, Kenya Institute of Curriculum Development, Masai Technical Training Institute, Mombasa Technical Training Institute, Rift Valley, Technical Training Institute, Thika Technical Training Institute) developed various non-formal community training courses published at COL website. The drafts for the courses were developed during a workshop held in Nairobi, Kenya in November 2013. Below are some examples of the courses that were developed:

- **Basic Manicure and Pedicure Skills.** Manicure and pedicure treatments are one of the fastest growing services in the beauty therapy industry in Kenya. The Basic Manicure and Pedicure Skills course develops knowledge and skills in the application of manicure and pedicure beauty treatments. This course provides an introduction to the practice of manicure and pedicure and how to provide a full consultation to clients. Students also learn how to maintain good hygiene and safety in all procedures, and how to perform a professional manicure, pedicure and special treatments.
- **Poultry Keeping.** Poultry keeping is one of the most popular forms of business among small-scale farmers. This is because poultry requires little capital, is easy to rear and easy to manage. Poultry keeping thus provides farmers with an opportunity to start an income generating activity.
- **Mobile Cell Phone Repair and Maintenance.** The widespread ownership and use of mobile phones has created a need for skills of repair and service mobile phones. The course is meant for people who would like to start and run a mobile repair and servicing business. By the end of the course participants should be able to disassemble and assemble a mobile phone, diagnose the problem, service and repair a mobile phone with the help of proper tools and instruments.
- **Producing Interlocking Stabilized Soil Blocks.** This is a course on brick making for non-formal community training. The course is a response to community needs in rural areas where soil is one of the main materials used for the construction of traditional low-cost houses because it

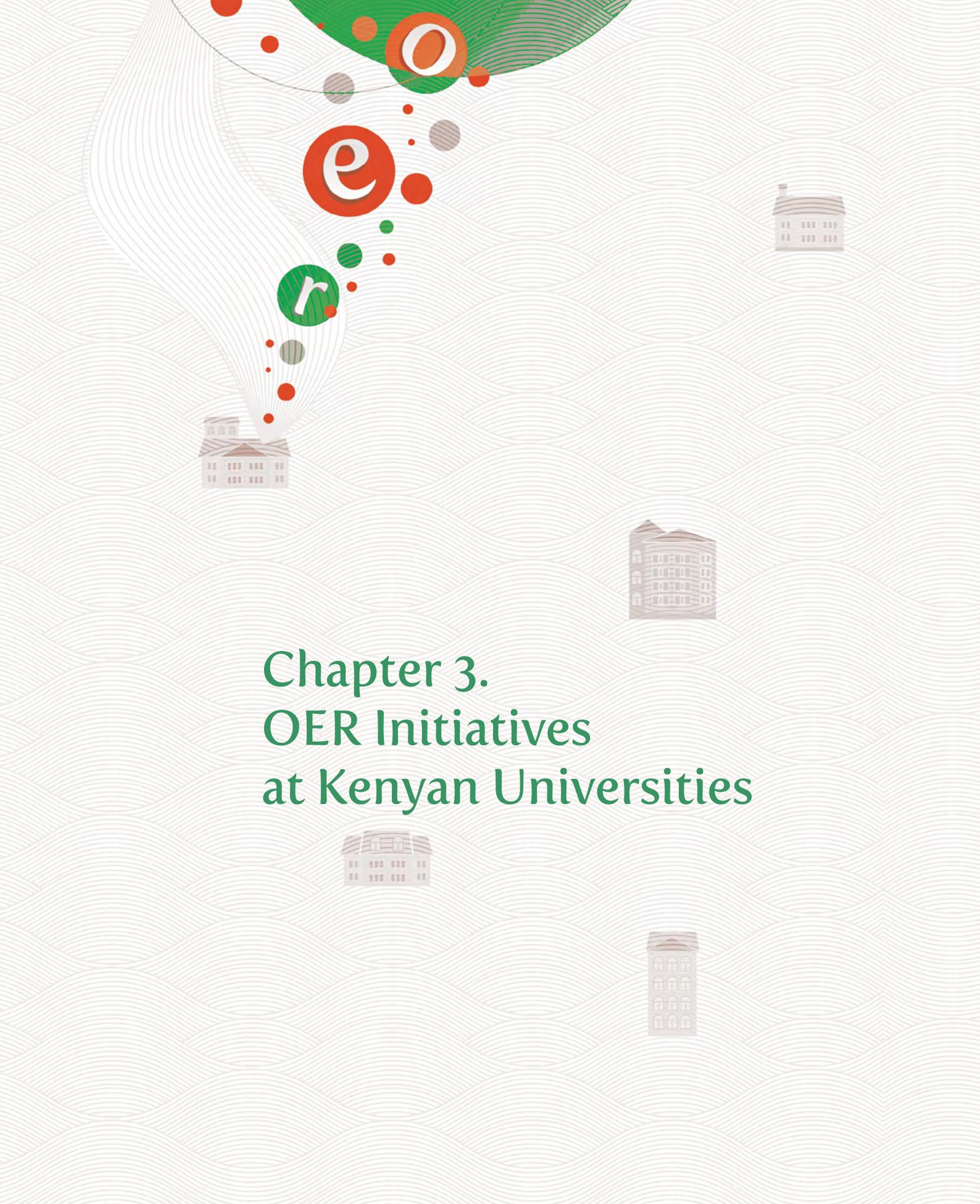
is cheap and locally available. The course explains how to produce interlocking stabilized soil blocks (ISSB), which is a type of unfired brick. The course covers the tools and equipment used to make the soil blocks and how to select and test the soil used for making them.

The courses can be downloaded from the COL's Open Access Institutional Repository.



The screenshot displays the website interface for the Commonwealth of Learning's Open Access Institutional Repository. The header features the COL logo on the left and the 'Oasis' logo on the right, with the text 'Commonwealth of Learning's Open Access Institutional Repository' below it. A navigation bar includes links for 'Oasis Home', 'Publications', 'Learning Materials & Open Educational Resources (OER)', and 'View Item'. The main content area is titled 'Poultry Keeping and Management: A Flexible Learning Course'. It lists the authors: Maina, John Michael; Chemwetich, Joseph; and Eunice, Jepkemboi Kerich. An abstract describes the course, developed through the INVEST Africa partnership, focusing on poultry keeping for non-formal community training. On the right side, there is a search bar labeled 'Search Oasis' with a 'Go' button and radio button options for 'Search Oasis' and 'This Collection'. Below the search bar is a 'Browse' section with links for 'All of DSpace', 'Communities & Collections', 'By Issue Date', 'Authors', 'Titles', and 'Subjects'.

Figure 8. COL's Open Access Repository (<https://www.col.org/resources/tvsd-open-educational-resources-oer>)

The background features a repeating pattern of light green, wavy lines. In the upper left, a large green circle contains a white 'o', with a red circle containing a white 'e' below it, and a green circle containing a white 'r' further down. A trail of smaller circles in red, green, and grey leads from the 'r' to a small building icon. Another building icon is in the upper right, and a taller building icon is in the middle right. A fourth building icon is at the bottom center, and a fifth, narrower building icon is at the bottom right.

Chapter 3. OER Initiatives at Kenyan Universities

In general, most tertiary institutions in Kenya are to some extent involved in innovative learning programmes that seek to take advantage of advancements in ICT. A significant number of universities now have some form of open, distance and e-learning. Similarly, nearly all major universities in Kenya run reliable online repositories of their research and instructional materials but with varying degrees of IPR protection, with some resources being open access. A brief overview is provided below of a few of these universities including Africa Nazarene University, Egerton University, Kenyatta University (KU), University of Nairobi (UON) and United States International University (USIU). Also described is the Borderless Higher Education for Refugees (BHER), a consortium of Kenyan and Canadian Universities. These universities have begun to incorporate or experiment with the use or creation of OER, with the exception of Africa Nazarene University that seems to have developed an institutional level policy on OER integration.

Africa Nazarene University

Africa Nazarene University (ANU) is a Private Christian University sponsored by the Church of the Nazarene International. The student population has grown from only 63 in 1994 to approximately 4,000 in 2012. It offers flexible modes of study ranging from campus-based, school-based, evening programme and distance learning. The ANU Institute of Open and Distance Learning (IODL) was established in 2011 to assist mature and self-motivated learners, often those already in the workplace, to further their studies without the constraints of attending campus-based lectures on a full-time basis (Ooko & Mays, 2015). Many of the students are pursuing non-traditional learning pathways through evening classes, school-based learning and distance learning. Currently 328 are registered as distance students (Ibid.).

The ANU IODL has adopted the use of CAMS (an academic management system) and Moodle (a learning management system configured for ANU as “ENAZ”) to enable distance learners to register and contact lecturers for tutorials, discussions and completion of continuous assessment processes online. The courses offered through distance learning include the following ones: Bachelor of Commerce, Bachelor of Business and Information Technology, Bachelor of Computer Science, Bachelor of Mass Communication, Bachelor of Christian Ministries, Bachelor of Education, Bachelor of Counseling Psychology, Bachelor of Dryland Natural Resource Management, Bachelor of Theology, Bachelor of Peace and Conflict Resolution, Master of Business Administration and Master of Arts in Religion.

ANU signals that it plans to expand the use of resource-based e-learning and observes that the expansion should be premised on student-centered and flexible approaches that can reach even the poorest and most remote students. It underscores the growing trend toward resource-based blended learning approaches, and the role that OER can play in supporting this called for shift in pedagogy. The ANU has developed a policy document entitled ‘*Policy on OER integration into ODeL and Campus-based Provision*’ (ANU 2015, p. 3).

It is noted in the policy document that to be successful and sustainable, OER integration cannot be a sideline activity within an institution or education system. The development of learning resources needs to be integrated into institutional or systemic processes in order to both leverage its potential and provide for its sustainability. Likewise, policies, particularly around intellectual property rights, remuneration, and promotion, need to be adapted to support and sustain licensing of educational materials as OER (ANU 2015, p. 3).

Following an OER orientation workshop facilitated by OER Africa in August 2013, the faculty at ANU have begun to integrate OER into their curriculum, especially those in the field of teacher education. Additionally, distance students are encouraged to use OER in conducting research and completing class assignments. This has prompted the need to organize regular information literacy training for both students and lecturers to enable them to effectively make use of available OER. Some of the lecturers in teacher education continue to adapt and use OER in their classrooms and online using the teaching styles available, for example, from the MIT Open Courseware website, therefore enriching their classroom teaching and learning experiences (ANU 2015).

Mathematics education for teachers at ANU has benefited the most from the use of 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, learning basic mathematics and calculus. These resources include LaTeX, which is a document preparation system and document markup language. The teachers have found LaTeX appropriate for professional writing of mathematics papers, books, articles, etc. Also in use is "Microsoft Mathematics" which provides a graphic calculator that plots in 2D and 3D, and supports step by step equation solving. "Graph" which is an open source application used to draw mathematical graphs in a coordinated system has also been used by the lecturers and education students. Maxima, a system for the manipulation of symbolic and numerical expressions, has also been used to plot functions and data in two and three dimensions (ANU 2015).

In addition to the e-books and e-journals available in the ANU library databases, lecturers are producing teaching modules for the distance students using OER. Both students and lecturers have used OER from various online sites such as e-books, journals and videos. For the ANU this had led to the need to encourage and regulate such practice within the framework of a formal policy. It is stated (ANU 2015, p. 6), that the rationale for the ANU OER policy is 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 (information technology, library, etc.) and other support services;
- identify human and other resources to support faculty in developing OER for teaching and learning;
- define collaborations within and beyond the university and the intent to allow access.

The ANU (2015) OER policy document provides the following guidelines and strategies to inform practice around OER integration:

- **Avail courses online:** It is stated that in order for ANU to benefit from and contribute to the OER community, it is vital that — at a minimum — all courses be represented at a basic (introductory) level on the ANU website and Moodle platform. Therefore, all academic staff are required to make their syllabus, mark distribution and assessment schedule available online for students to access via the ANU website and Moodle platform.
- **Types of licenses:** ANU has adopted the Creative Commons (CC) license scheme as its basis for sharing OER, because it addresses various copyright issues and sharing options that have been identified. The Creative Commons (BY) license has been chosen as the default license for ANU because it is the most open of all the CC licenses.
- **Ownership and licensing:** Faculty who produce materials reserve the right to decide on the conditions under which the material will be shared except if the material is paid for or commissioned by the university. In this case, the university will expect that staff first identify what already exists as OER before developing new content. The university will also determine the condition under which the material will be shared, with the default license condition being Creative Commons Attribution license (CC BY). Materials, which do not indicate any specific conditions for sharing, will automatically be considered to have been shared under a CC BY licence (Ibid., p. 5).
- **Students:** Students will not be independent creators of OER material. Students who assist with creating or producing OER shall be acknowledged as collaborators. If students are involved in developing OER as part of their university education, the authorship rights should belong to the university but the students will be appropriately attributed.
- **Motivate content development experts to integrate OER:** There is a significant expertise in the university for content development, so the university will identify and motivate faculty who are already involved to integrate OER into the materials development process and will encourage others to do likewise.
- **Budgetary allocation for OER:** Schools and departments will be required to make budgetary allocations for the development of OER-integrated materials within their units. They will also be required to explore external sources of funding including grants and collaborations to roll out OER as a means of addressing existing curriculum needs.
- **Avail required tools:** The university will provide software and hardware options that are suitable for OER producers and users where possible. Schools are required to provide appropriate hardware and software options for the development of OER in their respective departments.
- **Improved ICT infrastructure:** The OER policy is dependent on the effective implementation of the university's ICT policies. ANU has invested in increased internet bandwidth as well as

working towards providing a more efficient intranet system with wider coverage within the university as well as non-residential student areas using wireless technology. The local intranet will provide a platform for distribution of OER materials to students and faculty members. The IT network will support the OER website that shares materials online.

- Institute collaboration across disciplines and units: ANU encourages a teamwork approach to curriculum and materials development to bring together different kinds of expertise available across the university, e.g. disciplinary, pedagogic, design, systems, ICT, etc. Coordination of materials development and review processes, as well as the various stakeholders involved in these processes, will be undertaken by the IODL.
- Training for OER Creation: The IODL will also play a foundational role in building the capacity of faculty and design and media related skills for staff and students engaged in OER, as well as provide the human resource to assist in the development of OER. The ICT Directorate, the ANU library, the regional support centers and all other relevant departments will support the design, development, review, sharing and storing of OER.
- Partnerships to foster sharing: ANU will foster open sharing of educational materials with other Kenyan institutions and with other institutions more widely through collaborations with bodies such as the African Council for Distance Education, OER Africa, the African Virtual University and others.
- OER review system: A department-based review mechanism will be established to approve OER content. An OER Coordinator will oversee the entire review and approval process. OER quality and legal concerns should be addressed before publication. At the university level, an OER Board will be created to review policy, as well as the production, delivery and access processes of OER (Ibid., p. 8).
- Recognition: It is stated that production and publishing of internally and externally reviewed OER will be recognized and given similar credit as peer-reviewed research publications. Faculty will be allowed to spend time for producing OER materials and staff involved in OER publications will be eligible to receive OER grants (Ibid., p. 8).
- Institute an OER Day: To facilitate innovation and motivation, ANU through the IODL will institute an annual exhibition of OER materials from all departments, such as 'OER Day'. This will enhance the reputation of those departments that excel in OER production and make their accomplishments more visible to the university at large. In addition, the university can promote the OER culture by organizing certificate-awarding advocacy seminars, hands-on workshops, etc. for faculty and staff (Ibid., p. 8).
- Liability: Some of the issues discussed under liability include getting permission from participants if their image will be used in an OER and providing warning about medical or other sensitive materials. It is stated that all OER materials shared from the university should carry a disclaimer indicating that the material is for educational purposes only and that the university absolves

itself of any practical misuse of the content. OER materials authored and published by university staff do not necessarily reflect the opinion of the university.

As the above discussion shows, Africa Nazarene is one of the few institutions that have come up with an institution level policy specifically for OER integration. It would be interesting to find out how this policy is being implemented and what results are achieved. The other universities presented below have begun to experiment with OER at the departmental level or through their centers for open, distance and e-learning.

Egerton University

Egerton University is one of the seven public universities in Kenya. It was Agricultural College until 1987 when it was established as a University in through an Act of Parliament. It has three campuses and one Campus College. The University currently has a population of about 19,000 students; 514 academic staff; and 1,441 non-academic staff. The university has made remarkable progress towards increasing access to higher education in Kenya through different modes of study such as open and distance learning. In 2002, Egerton College of Open and Distance Learning (CODL) was established and mandated to promote and facilitate the expansion of open and distance education. Through local and international partnerships, CODL has managed to offer various undergraduate and postgraduate programmes such as Bachelor of Commerce, Bachelor of Arts, M.A in Linguistics, M.A in Economics and Master of Community Development among others.

The CODL has entered into partnership with the Kenya Department of Defense to offer training to military staff who wish to further their education. The institution has established international linkages with leading distance learning institutions in Africa and UK such as University of South Africa (UNISA), Open University of Tanzania, Africa Virtual University and Open University, UK.³ Its collaboration with UNISA has been instrumental in the conceptualization and formation of a Continental Universities Association of Distance Learning called the African Council for Distance Education (ACDE), which was launched in January 2004 at Egerton University. ACDE's mandate is primarily to promote research, policy and quality in open and distance learning to increase access to education and training in Africa. Through this collaboration, Egerton has managed to train 60 lecturers and professors on the writing of distance learning materials.

Egerton University is also one of the higher education institutions in Kenya that has embraced Open Access resources. To that effect, it has developed a digital repository called Egerton University Institutional Repository, which hosts open digital research materials and the results of scholarly work being undertaken at the institution. The materials include peer-reviewed articles, technical reports, working papers, student theses and conference proceedings among others.⁴

³ <http://www.egerton.ac.ke/index.php/Distance-Learning/partnerships.html>

⁴ <http://ir-library.egerton.ac.ke/jspui/>

As the premier institution in agricultural research in Kenya, Egerton University has run agriculture-related online training as 'Farmers Agricultural Training' modules to farmers on an OER model under the Tegemeo Institute. The following OER⁵ are published in the OER Africa repository:

- Farmers' Agribusiness Training Course: Module 1 Supplementary Reading. Rural Financial Services in Kenya: What is Working and Why?

This study examines the evolving structure of the rural financial services in Kenya and the extent to which the current financial institutions have improved access to producers and traders in the rural areas.

- Farmers' Agribusiness Training Course: Module 1 Supplementary Reading. Agricultural Extension in Kenya: Practice and Policy Lessons.

The objective of this study is to assess the range of alternative food crop and livestock extension services currently operating in Kenya.

The TESSA Initiative at Egerton University

Through its Faculty of Education from the Njoro Campus in the Rift Valley, Egerton has been a member of the TESSA consortium since its inception in 2005 and was involved in the development of the TESSA OER for teacher training and to version them specifically for Kenya. The Faculty of Education uses the OER in several of its programmes. Egerton draws many of its Education students from the local area, particularly those who are engaged in in-service programmes to upgrade teaching qualifications. It has also developed strong relationships with a wide network of local primary schools, notably with schools that provide pre-service teacher training every year. The education faculty visit the schools regularly to observe teaching practice as part of the assessment of the teaching qualification.

The study by Cullen, Keraro & Wamutitu (2012) looked at how Egerton University was working directly with local schools to encourage them in their use of school-based professional development using the TESSA OER. They discuss the kinds of leadership practices which are in evidence and which are helpful to increasing and sustaining this kind of school-led teacher education.

A few graduates of Egerton's B.Ed primary education programme (which uses the TESSA OER) have become Teacher Advisory Centre (TAC) tutors who lead on professional development in schools in a district. Egerton graduates working in local schools are in a position not only to use TESSA OER in their own classrooms but to help influence fellow teachers in the school to do likewise. At some point a critical mass of interest has been reached, and Egerton University and the local district have over the past two or three years begun to lead workshops for local head teachers, deputy head teachers and subject panel heads in the use of TESSA OER for CPD in the schools. For example in February 2011, Egerton and the Molo district ran a workshop on TESSA OER for 50 science subject panel heads;

⁵ <http://www.oerafrica.org/publishersource/egerton-university-tegemeo-institute-agricultural-policy-and-development>

in October 2011, Njoro district organized a workshop for 90 primary school head teachers on the use of TESSA OER. In August 2011, a larger-range workshop was held, involving District Education Officers and TAC tutors from 5 district as well as the Director of Education from the Rift Valley and a representative of the Ministry of Education. The interest of all involved is to find workable methods of supporting teachers in the classroom and improving the quality of teaching and learning: that is to provide practical and inexpensive continuous professional development for those working in the schools. Cullen, Keraro & Wamutitu (2012) found that leadership is critically important for this kind of school-based teacher education and noted that without the direct and strategic support of school leaders, it is difficult to organize and sustain this kind of continuous professional development.

Kenyatta University

Kenyatta University is one of the leading public universities in Kenya. Following an act of Parliament, it was granted university charter in 1985. Currently, it has five primary campuses, each experiencing rapid growth. The student population has grown from about 8000 in the late 1990s to more than 45,000 students today (Earnsting, 2016). As stated in the Kenyatta University (KU) website, KU is accredited by several bodies, including the Commission of University Education (CUE), Inter-University Council for East Africa, Africa Association of Universities and Commonwealth Universities.

The University's Digital School of Virtual and Open Learning, (DSVOL), formerly Institute of Open, Distance and e-Learning, was launched on 30th of June, 2014 with an aim to deliver education training at any time and place. The school offers programmes ranging from diploma, undergraduate and postgraduate levels. Apart from offering online support to its learners, the school has also established regional centres to provide onsite tutorials in Nairobi, Kericho, Marsabit, Kisumu, Mombasa, Nyeri, Embu, Kakamega, Garissa and Nakuru (KU, 2014). The DSVOL also provides tablets to eLearners loaded with content on units that they are registered for. However, access to the educational content from the DSVOL is not open because it requires login details.

KU has a library website repository with open access full-text books provided under the Creative Commons License. The repository contains books, book reviews, book chapters, conference workshop and seminar papers, undergraduate projects, research papers, policies and reports, newsletters, service delivery charters, graduation booklets, public lectures and speeches, Masters and PhD theses and dissertations, and KU journals. The site requires login information for registered members.

An example of an OER initiative with KU is the collaboration with the South African Institute for Distance Education (SAIDE) in its Educational Technology Initiative, ETI. Working together with a team of Kenyatta University lecturers, SAIDE provided the following support services to Kenyatta University (OER Africa, n.d.):

- Development of Research Methods course materials for Moodle and creation of Chemistry and Communication Skills e-learning modules;

Current State of Advancement of Open Educational Resources in Kenya

- Report on comparison between ATutor and Moodle (learning management systems); and
- Sourcing of OER by completing detailed online searches for relevant content (as per curriculum requirements) and by making requests to universities around the world.

Kenyatta University was a UNESCO case study (2006). According to UNESCO, Kenyatta University is a model of an existing institution that added a 'virtual' component to extend its educational offerings through participation in an international project. Kenyatta University and AVU has had a long-term relationship dating back to 1997. It was one of the initial six institutions that joined the African Virtual University (AVU) to offer distance and e-learning programmes.

In 2013, the AVU's Multinational Project II was launched at Kenyatta University to implement the multinational project funded by the African Development Bank (AfDB). The launch involved raising awareness on the project's activities and expected outcomes, as well as enhancing the use of AVU's open education resources. Through the multinational project II, the AVU also hoped to reduce the

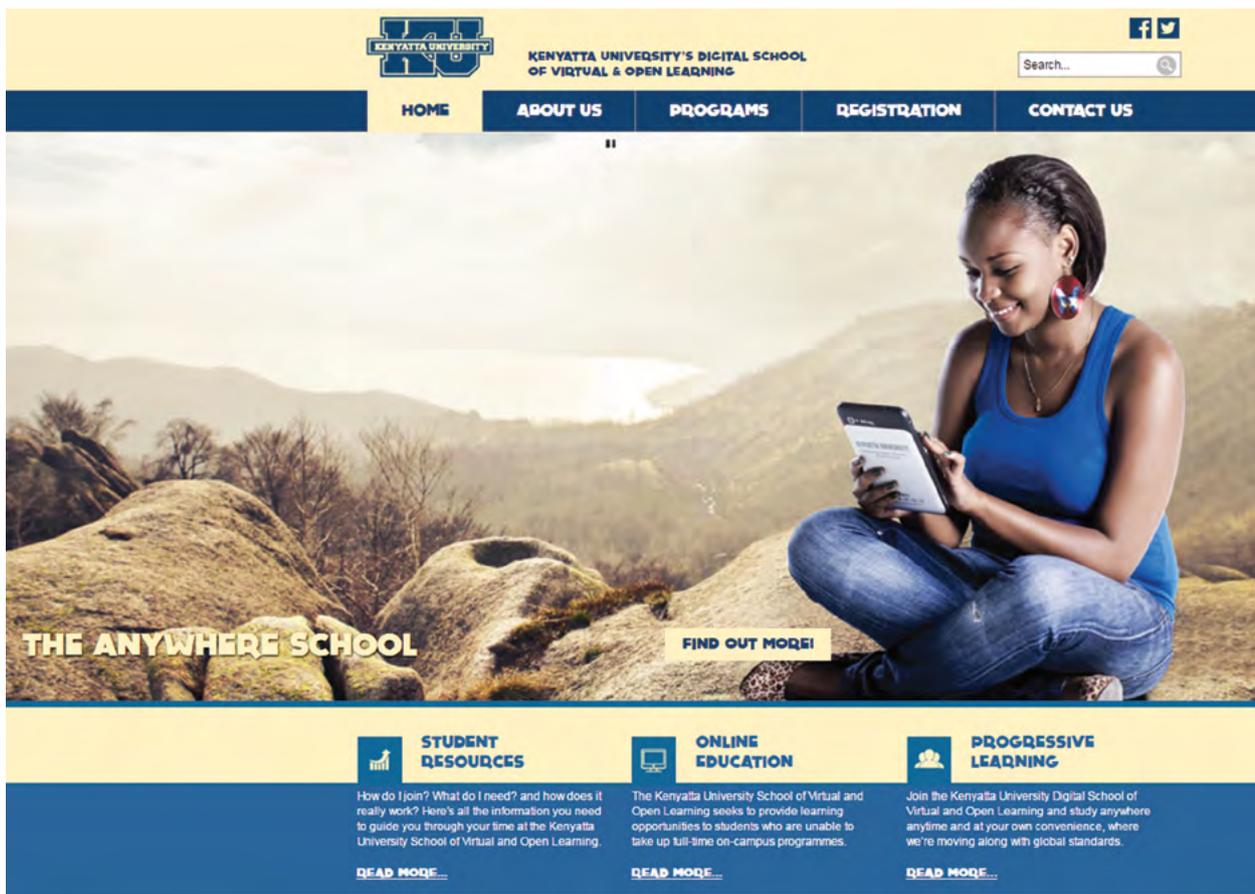


Figure 9. Kenyatta University Digital School of Virtual and Open Learning (<http://ku.ac.ke/dsvol/>)

gender disparity in science disciplines by awarding more scholarships to female students. The project included:

- Technical assistance to countries and universities;
- Enhancing the use of open educational resources;
- Implementation of programmes such as the teacher education;
- Computer science;
- Peace and conflict resolution;
- Capacity enhancement of university academics in developing, managing and implementing their own programmes using e-learning programmes.

The current growth from the Institute of Open and Distance Learning to the Digital School of Virtual and Open Learning (DSVOL) is evidence of the growth of KU in this area.

University of Nairobi

The University of Nairobi (UON) is the first institution to offer university education in Kenya and is currently the largest offering 400 academic courses in its seven campuses. As of December 2012, it had a student population of 61,000, 1,500 teaching staff and 3,400 non-teaching staff. UON has a Center for Open and Distance Learning (CODL) that was established in 2003 following recommendations by its senate. CODL's mission is to provide and maintain equitable opportunity for accessing quality university education through the use of multimedia, consultancy and research in open and distance learning.

In conjunction with faculties within the university, the CODL has successfully developed open and distance learning resources (Ogeda, 2006). Some of the key challenges experienced in the process were related to policy and infrastructure, human resource capacity and inadequate technical competence of lecturers to effectively tutor online (Wafula 2013 & Odumbe 2013). So far CODL has developed materials in Pharmacy, Medicine, Dental and Nursing, Bachelor of Commerce, Bachelor of Arts, Bachelor of Education (Science and Arts), Master of Arts in Project Planning and Management, Master of Education, Master of Administration and Planning, M.A Educational Foundations, M.A Distance Education and Bachelor of Information Communication and Technology.

The process of resource development involved training, that included joint writing workshops, authoring, review, editing and finally conversion of the materials to downloadable e-content and audios (CODL, 2003; Ogeda, 2006). However, the course materials are not open for access by the public since one has to provide login details to access them. There is limited access to publications at the UON CODL website. The website only provides publications' abstracts without links to full-text publications.

In 2012, UON signed the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities as evidence of its commitment to the global Open Access Initiative. So far it has developed an open access policy, which has led to the establishment of a digital repository called the University of Nairobi Digital Repository.

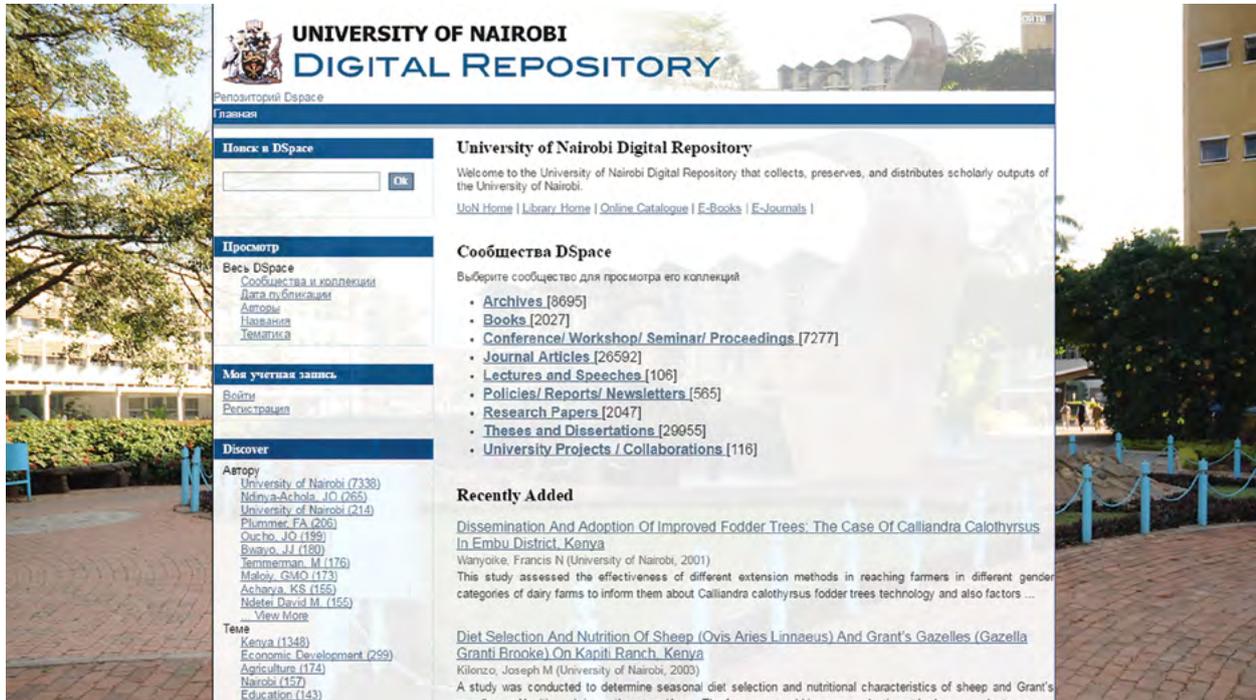


Figure 10. UON Digital Repository (<http://erepository.uonbi.ac.ke/>)

The digital repository is a non-profit and open-access facility meant to provide long-lasting storage and enable the university to showcase its scholarly output, enhance its global visibility and collaboration with others in the production, transmission and utilization of scholarly knowledge (UON, 2012). The digital repository hosts digital content which ranges from books, journal articles, conference proceedings, technical reports and working papers, theses and dissertations research projects to open and distance learning modules. These resources can be accessed at <http://erepository.uonbi.ac.ke/>.

Some of the actors involved in the creation and use of the open access materials are the lecturing staff involved in the open and distance learning programmes, staff involved in research, students who undertake research projects, theses and dissertations and C4D Lab among others (UON, 2012). Review of materials submitted by repository staff and quality assurance officers ensure that quality materials are uploaded into the repository as well as uploading journal articles that have been accepted for publication by peer-reviewed journals (UON, 2012). Individuals who submit materials for uploading into the repository are required to sign the University of Nairobi Digital

Repository Deposit Agreement. A depositor's acceptance of the agreement grants the university a non-exclusive right to reproduce, translate and distribute the submission in any format or medium worldwide.

In 2013, the Computing and Development Lab (C4DLab) was established in the School of Computing and Informatics at the UON. Its main aim was to incubate innovative ideas, build capacity and training, prototyping, engaging in research and dissemination. This Centre serves the entire university (C4DLab, 2013). With support from UNESCO, in the promotion for Open Educational Resources (OER) what came to be referred as OERization, the UON released interactive online materials for four pilot courses onto the OER Commons platform. The courses include: Innovation Studies; Introduction to Business and Entrepreneurship; Data Mining and Introduction to Database Systems (C4DLab 2015; UNESCO 2015). The programme was implemented by C4D center, which is a multidisciplinary institution.

United States International University

United States International University (USIU) was registered under the Companies Act in 1969 and established in Kenya as a university in 1970. In 1999, it was accredited by the Commission for Higher Education in Kenya and, in 2008, it was accredited as an independent university by the Western Association of Schools and Colleges (WASC) in the United States. USIU-Africa is situated in Nairobi and is an independent, not-for-profit institution with a student population of 6032 from 70 nationalities. The university offers 24 degree programmes from undergraduate to doctoral levels which are all accredited in Kenya and United States of America.⁶

In 2011, USIU and its consortium partners (Michigan State University and the Global Business School Network) received an 18 month grant from the Bill & Melinda Gates Foundation to support the development and delivery of training leading to a Certificate in Management and Innovation for Agribusiness Entrepreneurs (CMIAE).⁷ The aim of the program is to improve management and leadership capacity of the small-scale agribusiness entrepreneurs by training them on analytical tools, market oriented skills and information to increase the quality and productivity of the agricultural sector. In so doing, it will facilitate an environment that makes the agricultural sector more effective in improving the lives and livelihoods of small-scale agribusiness entrepreneurs. The uniqueness of the training is based on the fact that it focuses on small-scale agribusiness entrepreneurs, who to a greater extent have been left out by established public and private training institutions and addresses deficiencies in currently available training.

So far, the programme has developed syllabus training materials for 14 modules (8 core modules and 6 Agribusiness modules), as well as 12 Agribusiness teaching case studies for each of the modules.

⁶ <http://www.usiu.ac.ke/about-usiu/history>

⁷ <http://www.usiu.ac.ke/agribusiness/about-us/>

These materials are shared as open education resources through OER Africa platform (<http://www.oerafrica.org/agricultureoer>) and USIU online portal (www.usiu.ac.ke/agribusiness). The availability of the materials as open educational resources presents an opportunity for institutions in Africa to offer similar training in the region and across Africa. Six cohorts consisting of more than 200 agribusiness entrepreneurs (i.e. 50% women and 50% men) drawn from across East Africa have successfully participated in the training.

Muniafu, Wambalaba, Wanyama, Nduati, and Ndirangu (2013) in a study titled *Using OER as a Tool for Agribusiness Management Training for Hard-to-Reach Rural Farmer Population* described how USIU developed Agribusiness Management Modules for farmer organizations and highlights their impacts on farmers. According to the Muniafu et al. (2013) study, the USIU Agribusiness Management Modules for Farmer Organizations were developed for a period of over one year in partnership with farmers from various parts of the country on an OER platform. The Modules were developed against the backdrop of numerous challenges that small-scale farmers face in Kenya despite the significant contribution of small-holder farming to the country's gross domestic product. Therefore, the aim of the Modules was to help both farmers, who had limited training in commercialization of agriculture, and farm organizations to have access to additional skills and knowledge that would enable them transform their farming from a livelihood practice (farm) to a business enterprise.

The Modules included capacity-building and awareness-raising on OER platforms, an understanding of packaging information, using and re-using OER materials among all USIU AgShare project partners.⁸ Students developed case study scenarios through interviewing, data collection, writing farmer stories and capturing their experiences through films and pictures. The completed draft was shared with stakeholders to get their feedback, input and possible adoption. An AgShare fellows programme, which consisted of all stakeholders who championed the OER concept within their respective universities and communities, was also created.

The nature and extent of the farmers' engagement with the OER materials and involvement in the training program grew over time. They began by providing information to the USIU faculty to develop case studies, the farmers were then provided with training on how to practice commercial farming as opposed to subsistence farming, and afterwards they managed to access farming and managerial information, as well as the feasibility of farming as a firm. Overall, the farmers were taken through the following course modules:

- Module 1: Structure of the agricultural sector and policies
- Module 2: Agribusiness management for farmer organizations
- Module 3: Entrepreneurship mindset

⁸ AgShare is a partnership between institutions which aims at influencing the focus of existing organizations in different sectors to create and openly share different types of OER that strengthen African MSc Agriculture curriculum and promote the use of the OER by other stakeholders.

- Module 4: Information and Communication Technologies in support of agriculture
- Module 5: Sustainable agriculture

The project reached approximately 10000 farmers (Muniafu et al. 2013). The farmers acknowledged that “the project team surpassed their expectations because of knowledge gained. They were also surprised to learn that the information they provided could be accessed worldwide and felt involved in developing the case studies” (Ibid.). The OER materials provided farmers with up-to-date materials as opposed to government websites, which were not updated on various farming methods. Consequently, through the OER materials farmers were able to change how they operate their farms.

However, the major challenge associated with the developed modules was that the farmers needed to be computer literate and have access to computers. A post-project follow up of the farmers revealed that none of them had managed to visit the AgShare website after the project due to lack of computers and access to the internet. This shortcoming can however be addressed using ICT technologies such as mobile phones.

From the study’s findings the following recommendations were given by the stakeholders:

1. The OER materials should be included by the government on the Kilimo website to promote the use of e-agriculture;
2. Incorporate the materials in Moi University’s Collaborative Master of Science in Agricultural and Applied Economics (CMAAE) programme as a graduate student tool for research and outreach delegation;
3. Materials should be translated into national language and mother tongue for the sake of the English-illiterate farmers;
4. Provide training support in order to convince farmers to take advantage of AgShare materials on the OER site;
5. Donate more computers and computer training packages;
6. Distribute audio tape and training manual to farmers;
7. Put more emphasis on ICT in agriculture to enable farmers to obtain information from the internet. This would be achieved through intense periodic training and establishment of economic hubs;
8. Develop videos that focus on showcasing improvements implemented by other farmers;
9. Organize exchange programmes and visits among farmers; and
10. AgShare should open main resource centers with a contact person at different strategic areas.

Borderless Higher Education for Refugees, Dadaab

Borderless Higher Education for refugees (BHER) is a consortium of Kenyan and Canadian universities (Moi University, Kenyatta University, University of British Columbia and York University) that have come together with a mandate to offer education and training for refugees and certify the many volunteer teachers who are untrained. The BHER project is working with refugees in Dadaab, Kenya, one of the largest refugee camps in the world.

In reference to the BHER project, Kipngetich and Agumba (2016) describe how ICT and OER initiative are appropriate tools for improving access, equity and quality training for refugees in Dadaab refugee settlement schools in North Eastern part of Kenya. They indicate that ICT and OER have the potential for uplifting the quality of refugee education across the world and that sustainable education in refugee camps is difficult to achieve in many countries that host refugees. The authors highlight the challenges of integrating ICT and the implications this has for use of OER. These include lack of technological infrastructure, internet connectivity problems and ICT illiteracy among the educators and the learners.

While currently BHER is delivering mostly face-to-face learning programmes, it envisions that in the future this delivery will become increasingly dependent on ICT infrastructure and the use of e-learning and open educational resources. Once this happens, the whole Dadaab community at large will benefit as it will lead to a significant reduction of the cost of education because of the freely available OER and the refugee families will only need to cater for proper ICT tools.

Through the BHER project refugees will be able to graduate with accredited certificates, which are universally acceptable. This has offered the refugees a hope of pursuing further education or even relocating elsewhere with possibilities of finding employment wherever they go. BHER seeks to widen access to educational opportunities to help combat the difference between refugees and the rest of the world.



Chapter 4.
OER Integration in Kenya:
Challenges and
Recommendations

This chapter highlights the challenges and provides recommendations to OER adoption in Kenya. OER adoption in Kenya is gaining momentum as evidenced by the various OER initiatives being implemented in the country. However, the process of OER adoption in the country still faces various challenges that range from socio-cultural and economic in nature to lack of appropriate institutional and national policies. To surface the challenges and recommendations, the dimensions of open education resources and open education practices (Ehlers, 2011) is used as a sensitizing framework.

Dimensions of Open Educational Practices

The review of literature has occurred to be a useful analytic framework for OER adoption and use is the concept of Open Education Practices (OEP). The concept of Open Education Practices emerged out of the findings of the OPAL project (Camilleri, Ehlers, and Pawlowski 2014). The OPAL project led to the collection of over 80 case studies from Open Education Initiatives around Europe. The operation mechanisms and quality standards in place were studied in each case study. Analysis of the case studies in the OPAL project led to the generation of a set of 'dimensions' or themes across the case studies, which provided a common framework to be used for comparison or contrasting the case studies. The OPAL report proposed an OEP framework by identifying and describing existing cases of good OEP. These were then used to reveal a set of initial dimensions of outstanding achievements of quality and innovation through OEP, focusing in particular on what constitutes success factors and good practice. The framework and dimensions of good practice extracted provide an ideal or standard against which one can begin to collect, analyze data and organize findings on the basis of the dimensions/categories identified.

According to the OPAL (2010) report, OEP is defined as the full set of practices around the creation, use and management of OER. This includes the tools that are used to support this process, the resources themselves and any enabling frameworks. OEP covers the full spectrum of policy, research and practice around OER and involves almost all stakeholders involved in supporting and managing learning provision in educational systems. OEP address the whole OER governance community: policy makers, managers/administrators of organizations, educational professionals and learners. Some roles in the OER governance community identified in the OPAL study include teachers, students, managers, policy makers, technical editors, instructional designers, course developers, quality assurers, translators, OER mentors, e-Learning and OER researchers and the wider community.

Camilleri, Ehlers, and Pawlowski (2014) define Open Educational Practices (OEP) as practices, which support the (re)use and production of OER through institutional policies, promote innovative pedagogical models, and respect and empower learners as co-producers of their lifelong learning paths. They assert that open educational practices have the following characteristics:

- They build on OER and move on to the development of concepts of how OER can be used, reused, shared and adapted;

- They go beyond access into open learning architectures and seek ways to use OER for transforming learning;
- They focus on learning as a construction of knowledge assets, which they share with others and receive feedback and reviews;
- They follow the notion of improving quality through external validation because of the importance of sharing of resources;
- They are about changing the educational paradigm of many unknowledgeable students and a few knowledgeable teachers to a paradigm in which knowledge is co-created and facilitated through mutual interaction and reflection;
- They emphasize the fact that OER can contribute to the value chain of educational institutions.

Ehlers (2011) has further refined the definition and dimensions of OEP since the OPAL project. A brief definition states that: OEP are defined as practices, which support the (re)use and production of OER through institutional policies, promote innovative pedagogical models, and respect and empower learners as co-producers on their lifelong learning path. They address the whole OER governance community: policy makers, managers/administrators of organizations, educational professionals, and learners. These dimensions are presented below and will be used to analyze the various challenges and opportunities presented by the initiatives that seek to adopt the use, creation and management of OER for education and training in Kenya.

1. Extent of using and repurposing OER: Finding and using OER is often the first step towards open educational practices. To integrate an OER into one's own teaching/learning concept is called repurposing. It often involves dismantling the original resource and taking out what is useful while leaving aside the unnecessary.
2. Availability of a process for OER creation: In order for an organization to progress towards open educational practices it is important to define a process whereby educational resources are made available under free license schemes to become open educational resources. Only then will these resources be available for others to use and/or repurpose — internally or externally. A comprehensive organization-wide process for open educational resources boosts progress towards open educational practices.
3. Degree of sharing of OER and OEP: From research we know that the most successful use of open educational resources is where this is a sharing process. The openness required for sharing educational resources is hence a key success factor for open educational practices. In addition to a culture of sharing among practitioners and management, there should be tools for sharing resources and experience within the organization and with actors from other organizations. It is as important to share resources, as it is to share the experiences of what works and what does not within open learning architectures. Social network tools therefore play an essential role in any OEP strategy.

4. Extent of working with open learning architectures: Open learning architectures are an important element in OEP. They support learners in becoming autonomous and act in self-organized learning environments in which they can share, use and/or produce educational resources. The matrix in Figure below captures this link between resources and practices. It suggests different degrees of openness in the usage and creation of open educational resources. The span ranges from — no usage to — OER (re-) usage and creation. In these three stages the scale covers different realities within organizations' and/or individual learning behavior. This dimension of openness in resource usage and creation is set in relation to a dimension of pedagogical practice. The dimension of pedagogical practice is subdivided into three degrees of openness that represent different stages of openness in teaching and learning frameworks. The constitutive elements of OEP are depicted in the Figure below.

		OER Usage		
		Low No OER (re-) usage	Medium OER (re-)usage or creation	High OER (re-)usage and creation
Learning Architecture	High Social practices, Collaboration, Sharing (Reflection in action), <ul style="list-style-type: none"> • „open“ objectives • „open“ methods 	A	B	C
	Medium Dialog, Procedures, Rules (Know-how) <ul style="list-style-type: none"> • „closed“ objectives • „open“ methods 	D	E	F
	Low Knowledge transmission (Know that) <ul style="list-style-type: none"> • „closed“ objectives • „closed“ methods 	G	H	I

Figure 11. Constitutive elements of OEP (Ehlers, 2011)

Ehlers (2011) offers the following conceptualization for pedagogical levels of “freedom” or “openness”:

- Low degrees of openness exist if objectives and methods of learning and/or teaching are rooted in closed, one-way, transmissive, and reproductive approaches to teaching and learning. In these contexts, there is an underlying belief that teachers know what learners have to learn and mainly focus on knowledge transfer.
- Medium represents a stage in which objectives are still pre-determined and given, but methods of teaching and learning are represented as open pedagogical models. They

encourage dialogue-oriented forms of learning or problem-based learning (PBL) that focus on developing 'know how'.

- High degrees of freedom and openness in pedagogical models are represented if objectives of learning and methods (e.g., learning pathways) are highly determined and governed by learners. Questions or problems relating to which learning is happening are determined by self-regulated learners. Teachers facilitate through open and experience-oriented methods which accommodate different learning pathways, either through scaffolding and tutorial interactions (ZPD Vygotskian-inspired approaches) or contingency tutoring (strategies of reinforcement, domain or temporal contingency (Wood & Wood, 1999)).
5. Organizational vision for OEP: Expressing a vision in a written strategy or guidelines is essential. A vision for open educational practices would include reference to the production, sharing, use and/or reuse of OER. It would also aim to provide learning opportunities in open learning architectures, in which the aims and objectives of learning, as well as learning methodologies are developed in consultation with learners. Such a vision should be communicated and shared within the organization by all stakeholders.
 6. Existing OEP strategies and policies: Research shows that strategies and policies are most effective in stimulating OEP across organizations in an effective way. They embody rules and regulations for how to implement OEP across a whole organization. Elements relating to OEP can be either a part of an organization's strategy, e.g., for the development of learning environments, or can even be subject to their own strategy or policy. Policy makers implement OER policy through key white papers, via inclusion in strategy documents, through funding calls or through acting as a front to promote OER initiatives.
 7. Business model related to OEP: An ongoing critical discourse against the Open Educational Resources movement is the issue of how it can be made sustainable in the longer term, and what business models might be appropriate. Downes (2007) provides a useful categorization of funding models for open source type initiatives: endowment models (where the project obtains base funding), membership models (where a coalition is invited to contribute a sum), donations models (where requests are made for donations), conversion models (where initial freely made material ultimately leads to some element of paying consumer), contributor-pay models (where the contributor pays for the cost of maintaining the contribution and the provider makes it freely available), sponsorship models (such as commercial advertising), institutional models (where the institution assumes responsibility for the initiative), Government models (direct funding via Government agencies), partnerships or exchanges (where the focus is on exchanging resources).
 8. Partnerships related to OEP: Partnerships help organizations to develop OEP through the sharing of experiences, benchmarking of policies and strategies and resource development. Some OEP initiatives involve more than one organization and a number of partnership models

have emerged. In some cases these include different types of institutions (universities, technical universities, colleges); in other cases they focus on special areas, each led by a senior academic in that field. Partnership models range from organizations, which involve partners, who jointly develop and operate learning content for academic education with interdisciplinary institutions, different types of institutions (universities, technical universities, colleges), and some are also multilingual.

9. Perceived relevance for OEP: For OEP to achieve circulation within a given context it is important that learners, professionals and management perceive OEP as relevant. This can be supported through strategies and policies and also through measures to raise acceptance and understanding for OEP. An important factor often proves to be the degree to which OEP successes are communicable to others.
10. IPR and copyright regulations: One of the main focuses of OER lies in sharing, using and adapting resources. Copyright restrictions would negate the whole model. The four main legal issues associated with creating and making OER are copyright issues, ownership, intellectual property rights and permission for use. Many resources may be context-bound due to copyright issues in such a way that it is not possible to adapt the source to local prerequisites. Without the permission of the copyright holder it is strictly prohibited to copy, reproduce or change resources.
11. Motivational framework for OEP: In order to use OER and turn towards the implementation of open learning architectures, the level of motivation from educational professionals and learners has to be high. Some social or cultural barriers are known: academics may be skeptical to the value of investing in the creation of OER, or they may lack the necessary skills (either technical or pedagogical) to create or use OER. Cultural obstacles may exist in terms of sharing or using resources developed by other teachers or institutions, and there are usually no systems to reward academics for engaging with OER initiatives. Studies also show that academics may sometimes be apprehensive about taking part in such initiatives, feeling a loss of control and ownership over their teaching materials and concerns about possible misuse of any OER they produce. Achieving staff buy in and support, and making it relevant to them are key issues at this level.
12. Tools to support sharing and exchange of OEP: Every organization wanting to make progress in the field of OEP needs to adopt a series of tools, which can be used for finding, sharing, and repurposing resources, as well as tools like social networks to share experiences and good practices. The emergence of the Creative Commons license was a major breakthrough in terms of providing a means for sharing resources openly and freely.
13. Quality concepts for OEP: Quality concepts for OEP often depend on the type of institution and their learning and teaching culture, the balance of importance of the 'value' of teaching (in comparison to research activities in the institution), the degree to which OEP activities are seen as activities in their own right, the level of digital maturity of the institution and the extent

to which they had engaged with OEP work previously. QA models range from lightweight, user-defined models to strictly controlled hierarchical models.

14. **Level of knowledge and skills:** It is important to overcome educational professionals' initial concerns about OEP and to help with skills development and support. These include mechanisms to foster and support community engagement, provision of case studies of good practice, running of parallel events and workshops, and provision of specific training materials. It can also comprise marketing materials, guidelines and tutorials on OER, an open textbook adoption worksheet, OER needs assessment surveys, policies and models.
15. **Digital literacy:** Digital literacy is especially important for the implementation of OEP as it deals with digital resources and practices. Digital literacy is often understood in a purely functional way where it is conceptualized as a person's ability to perform tasks effectively in a digital environment. However, conceptualizations that focus more on the broader cognitive skills involved are emerging, like the understanding that digital literacy is a special kind of mindset that enables users to perform intuitively in digital environments, and to easily and effectively access the wide range of knowledge embedded in these environments. Sometimes also critical thinking rather than technical competence is identified as the core skill of digital literacy.
16. **Support mechanisms for OEP:** Support for the development of OEP includes technical support for development, use and re-use, as well as re-purposing of OER, and training in order to equip teachers with the skills to design open learning environments and/or help learners to become autonomous learners.

Not all these dimensions are applied in the challenges and recommendations presented in the next section, however they have been used as a sensitizing guide in the review of the literature and initiatives discussed in this report.

Challenges of OER Integration in Kenya

OER adoption in Kenya is gaining momentum as evidenced by the number of OER initiatives being implemented in the country. However, the process of OER integration in the country still faces various challenges that range from socio-cultural and economic in nature to institutional and national policies. The following section discusses the challenges to OER integration in Kenya and provides recommendations that can be adopted to address them.

Intellectual Property Rights and Copyright Regulations

One of the challenges associated with OER integration in Kenya is intellectual property rights (IPR) and copyright regulations, which require that the permission of IPR owners be sought for their materials to be freely available. For instance, Ochukut (2013) in a study titled *Implementation of Open Education*

Resources at the University of Nairobi: A Case of Innovation Studies Course noted that copyright issues were a major challenge to OERization at the University of Nairobi. Similar findings were documented by Gakindi (2010) who noted that “there was a certain fear to publish materials online publicly since other institutions might copy and use it for commercial purposes” (p. 89). As a result, some institutions, e.g. Moi University does not provide its students and faculty with passwords to its online databases for use outside the institution because of the high premium put on academic publications due to their scarcity unlike in the developed world.

Apart from Kenya, other Sub-Sahara African countries are also grappling with IPR and copyright issues in their attempt to adopt OER. For example, in Uganda, academic pride that comes with owning Intellectual Property makes academics to be unwilling to share their works (Ngimwa & Wilson, 2012). This has been attributed to the fact that most African academics do not have access to current information resources; hence, they tend to think that their work is still valuable while it might have been superseded by new knowledge generated elsewhere (Ngimwa & Wilson, 2012). Academic pride also makes some academics hesitant to have their works examined as OER for fear that they would not withstand national and international critique.

Motivational Framework

For successful adoption and implementation of OER, users and developers need to be motivated. Ngimwa and Wilson (2012) conducted an empirical investigation of the emergent issues around OER adoption in Sub-Saharan Africa and noted that there was unwillingness of potential OER users to spend time adapting and using the resources even where the benefits were evident as illustrated by a weather station developed by a Kenyan teacher whose colleagues recognized the benefits of the adapted weather station but were still unwilling to spend their time and energy engaging with it. The study further notes that some academics who have in the past earned an income from their own copyright materials were hesitant to participate in OER and release the copyright of their materials for nothing in return. The policy developed by Africa Nazarene University describes some strategies to motivate faculty including recognition similar to that accorded publications, providing technical support, and establishing an OER Day.

Level of Knowledge and Skills

The level of knowledge and skills regarding OER in Kenya is still low as evidenced in studies by Ochukut (2013), Gakindi (2010) and Ngimwa & Wilson (2012). Ngimwa and Wilson (2012) identified a general lack of awareness of OER amongst the non-TESSA participants interviewed in Kenya, Uganda and South Africa where the study was conducted. The non-TESSA participants stated that they had never heard of OER although they were involved in other Open Access activities. Some were also using OER resources without knowing that they were OER. Moreover, lack of computer literacy was found to hinder people’s readiness to participate and use OER content. For example, some of the older academics who are computer illiterate may resist being engaged in technology-related projects.

Existing OEP Strategies and Policies

OEP strategies and policies entail rules and regulations that govern the implementation of OEP across an entire organization. Some of the studies on OER in Sub-Saharan Africa (Ochukut, 2013; Gakindi, 2010; Ngimwa and Wilson, 2012) show that OEP strategies and policies are lacking or not fully developed at both national and institutional levels. For instance, a case study of Africa Nazarene University indicated that the institution has a policy and procedure framework but it is not yet sufficiently aligned to OER and ODeL (Ooko & Mays, 2015). Additionally, lack of necessary policies and strategies to guide implementation of OERization at UON was found to be a major challenge as the institution lacked a standardized way of licensing its OER courses (Ochukut, 2013).

In South Africa, universities still hold on to the policy that rewarded academics based on their publications in accredited journals because this corresponds to government policy for financing institutions (Ngimwa & Wilson, 2012). Therefore, the policy discourage academics from sharing their academic output openly as OER because this does not support them when it comes to promotions and related academic rewards.

Funding of OER/OEP

Financial sustainability is required for successful OER implementation in Kenya because dependency on funding is not a long-term solution and a poor incentive for engaging in OER. Some universities in Kenya such as UON may not have additional resources to allocate to OER as noted by Ochukut (2013); hence, this may slow down OER adoption.

OER Relevance and Quality

Gakindi's 2010 study documented that some of the potential OER users were skeptical about the quality of OER. These findings concur with those of a study quoted in Ngimwa and Wilson (2012). The study was conducted in Tanzania and documented that some of the instructors were suspicious about the quality of OER and other resources from the internet. The instructors could also not find resources, which were relevant to their contexts. In some South African institutions academics considered OER as foreign, hence resisted to adopt them. The academics indicated that they did not want to use resources they had not created because they believed their own content would be better (Ngimwa & Wilson, 2012).

Technological Challenges

To some extent technological issues have been identified as a challenge to OER adoption in Kenya. In some institutions access to computers is still limited while some are faced with costly unreliable internet services and low bandwidth (Ngimwa & Wilson, 2012). There is also the issue of level of comfort with technology and this is sometimes dependent on age, with older faculty being more resistant to explore the integration of technology.

Recommendations for OER Integration

Below are some recommendations that can be adopted by OER actors in Kenya in order to help realize successful integration of OER.

Establishment of Policies to Guide OER Integration

Institutions should put in place policies that allow for the use of open licenses and which provide for legal interventions in the event that an institution's materials are used unfairly for commercial purposes against what the licenses state (Gakindi, 2010). This will help to protect the content created by faculty. Ngimwa and Wilson (2012) further recommend that traditional institutional policies that guide how academics are remunerated need to be replaced with more open access friendly approaches. The policies should be revised to put academics' participation in OER development at the same level as research for tenure and promotional considerations. This will encourage participation and help change negative attitudes towards OER.

Policy change to support OER integration should also happen at the national level because this will not only influence appropriate support in terms of resourcing but also strengthen technology infrastructure such as affordable and widely available broadband that can support educational institutions' functions. In the first chapter we noted that the government through the Ministry of Education and with support from UNESCO and COL has begun the process to develop a national OER policy. Maybe the proposed National Open University of Kenya can take a lead in this by experimenting with this new paradigm since more established institutions might have to contend with a lot of challenges and initial resistance. The ANU policy in Chapter also addresses issues of reward and recognition.

Awareness Raising

Creation of OER awareness is also necessary at institutional and national levels. The first step should be to get an institution's administration and faculty to understand the value of OER. Awareness creation can be spearheaded by those who are willing and already aware of the benefits of such resources. This can help to change negative attitudes and encourage learners and members of staff to embrace new open practices. This process will need the support of the leadership of the institution to require that faculty be sensitized, for example through workshops that can be organized by the institution or through partnerships with external organizations such as the AVU, OER Africa, COL, UNESCO that are at the forefront of OER initiatives.

Creating a Motivational Framework

Institutions should develop reward mechanisms to motivate their staff involved in OER development. Such incentives can be in kind or in monetary value to offset lack of royalties from published OER.

Learners also need to be motivated to engage more with OER and finish the courses. For example, they can be offered certificates when they finish the courses. They should also be informed about the value and benefits of the OER courses. For example the ANU policy states that production and publishing of internally and externally reviewed OER will be recognized and given similar credit as peer-reviewed research publications. Faculty will be allowed time to produce OER materials and staff involved in OER publications will be eligible to receive OER grants.

Developing an Appropriate OER Business Model

Since the implementation of OER has financial implications, an institution must be ready to support OER projects. In order to do this, institutions can explore different models for funding their OER initiatives, for example by looking into different revenue models for the long-term stability and viability of OER initiatives. The idea can also be sold to the government so that it would fund the development of OER courses. In its policy, ANU notes that schools and departments will be required to make budgetary allocations for the development of OER-integrated materials within their units. They will also be required to explore external sources of funding including grants and collaborations to roll out OER as a means of addressing existing curriculum needs. An appropriate business model can be developed if institutions are able to prove that they can ensure savings or generate revenue through OER. This will require further research.

Training Learners and Staff on Basic ICT Skills

It is also important to equip both learners and potential OER producers such as university staff with basic ICT skills for the use and development of OER courses since most of them are published in online repositories requiring basic ICT skills to access, repurpose, upload, etc. There should be an instructional support center to help those wanting to start creating, using and repurposing OER. Most universities now have an institute or center for open, distance and e-learning, and that seems like a logical place to begin. Also recently graduated faculty who are the digital natives might feel more comfortable in such an ICT dependent environment and should be encouraged to develop innovative ideas around OER integration and recognized for it.

Avail OER in Non-Technically Supported Formats

Due to the costly nature of internet access and poor connectivity, OER can be availed in alternative formats such as print, CDs, DVDs, and in offline repositories to ensure that they are accessible in areas with poor internet connectivity. This was one of the strategies used by the AVU to widen access to its Teacher Education OER modules. The OER were produced and delivered in various formats, to ensure that they were widely accessible. In addition to being accessible in the AVU online repository, the materials were produced as printed booklets and on CDs and DVDs.

OER Quality

Quality of OER can be ensured in various ways. An institution can adopt resources from reputable institutions and repositories and use the librarians or faculty to sort and approve resources (Gakindi, 2010). Faculty members should also be urged to ensure that their materials are of high standard. Use of expert facilitators and the involvement of end users in the OER creation process has been adopted by initiatives like the AVU and TESSA described in Chapter 2. Peer review is one of the ways to make quality assurance a part of OER development to a quality process. Finding a way to incorporate innovative pedagogical models such as through open learning architectures and evaluating the learning outcomes of such initiatives against conventional ways of teaching is important to provide evidence of quality.

Partnerships Related to OER/OEP

Partnerships help organizations to develop OEP through the sharing of experiences, benchmarking of policies and strategies and resource development. A number of the OER initiatives involve more than one organization as evidenced by the different partnerships. We have seen collaborations among intergovernmental organizations, foundations, non-governmental organizations and institutions of learning around the issues of policy, adoption and use of OER.

From this study, we can conclude that the OER movement is still an emerging and evolving concept in Kenya with varying level of awareness and adoption among the different stakeholders. Tied to this is the level maturity with regards to the ICT infrastructure and ICT integration in education and the level of affordances these offer for the OER movement to take root. Nonetheless, the initiatives described in this report all have some aspects of openness that can be located with varying degrees on the OER maturity continuum. A number of these initiatives have aspects that can be located in the dimensions discussed in this section. An increasingly robust ICT infrastructure and the embrace of open, distance and e-learning provide an important prerequisite for OER promotion in Kenya.

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Appendix

TEACHER EDUCATION AND TRAINING

i. United Nations Educational, Scientific and Cultural Organization (UNESCO)

http://www.unesco.org/new/en/media-services/single-view/news/capacity_building_on_unescos_oer_platform_under_the_kenya_ict_competency_framework_for_teachers/#.VgkCeGR97fY

One of UNESCO's mandates is to assist educational planners and teacher training course developers to prepare teachers for making effective use of technology solutions. In this regard UNESCO has assisted the Ministry of Education, Science and Technology, the Teacher Service Commission and the Kenya Institute of Curriculum Development in the development of Open Educational Resources in ICT integration in education.

ii. African Virtual University

<http://oer.avu.org>

African Virtual University (AVU) is a Pan African Intergovernmental Organization whose aim is to significantly increase access to quality higher education and training through the innovative use of Information and Communication Technologies. AVU portal hosts 91 videos and 219 textbooks that break down into 73 modules, each available in English, French and Portuguese.

iii. Teacher Education in Sub-Saharan Africa (TESSA) Project

<http://www.tessafrica.net/>

TESSA is a network of teachers and teacher educators working alongside The Open University, UK, to improve the quality of classroom practice and access to teacher education resources across Sub-Saharan Africa. TESSA offers a range of Open Educational Resources (OER) in four languages, namely English, French, Swahili and Arabic, to support school-based teacher education.

INFORMATION AND COMMUNICATION TECHNOLOGY

The African Centre for Technology Studies (ACTS)

[http://acts-net.org/about-us/secretariat/
11-programme-projects/39-training-for-innovation-in-east-africa](http://acts-net.org/about-us/secretariat/11-programme-projects/39-training-for-innovation-in-east-africa)

ACTS is a regional think-tank, research and training organization based in Nairobi-Kenya whose vision is to harnesses applications of science, technology and innovation policies for sustainable development in Africa. Through one of its projects run in partnership with the Development Policy and Practice Group, it aimed at creating, adapting and enabling a wider use of OER for professional development in the East African region and beyond by developing co-training initiatives with public and private sector organizations.

HIGHER EDUCATION INSTITUTIONS/UNIVERSITIES

i. University of Nairobi

[http://www.oerafrica.org/system/files/9433/
uon-open-access-policy-final-dec-2012_0.pdf?file=1&type=node&id=9433](http://www.oerafrica.org/system/files/9433/uon-open-access-policy-final-dec-2012_0.pdf?file=1&type=node&id=9433)
<http://www.c4dlab.ac.ke/2015/03/lab-launches-four-uon-courses-on-oer-commons>

The University of Nairobi is committed to the global Open Access Initiative and has signed the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities. This Open Access policy provides scholars with the opportunity and platform to promote their academic work by enhancing access to research outputs. The University has also created four courses: Innovative Studies, Data Mining, Introduction to Business and Entrepreneurship, Introduction to Database Systems and uploaded them in the OER Commons platform.

ii. Africa Nazarene University (ANU)

<http://www.oerafrica.org/resource/opening-learning-africa-nazarene-university-case-study>

Africa Nazarene University (ANU) and OER Africa have signed a MoU that commits the two organizations to working together to support ongoing design, development, and implementation of ODeL programmes at ANU as well as integration of OER into both ODeL and face-to-face programmes.

iii. Borderless Higher Education for Refugees

<http://refugeereseearch.net/ms/bher/about-bher/>

The Borderless Higher Education for Refugees (BHER) Project aims to make educational programmes available where refugees need them. It provides gender equitable teacher training programs to working untrained teachers who can then contribute back to the community, increasing and improving education in the camp overall.

iv. International Association of Universities (IAU)

<http://www.iau-aiu.net/content/oer-and-academic-librarian>

IAU is the UNESCO-based worldwide association of higher education institutions. One of IAU projects developed in 2013 seeks to train and support academic librarians especially in developing countries to be able to identify and provide information on existing OER and inform faculty members and graduate students in the use, re-use and production of OER.

v. The Catholic University of Eastern Africa (CUEA)

<http://www.cuea.edu/>

CUEA has piloted an ODeL diploma programme for the Faculty of Education. The South African Institute for Distance Education (SAIDE) is supporting CUEA in their design and development of ODeL programmes and the integration of appropriate Open Educational Resources (OER).

vi. Kenya Methodist University, Meru

<http://www.oerafrica.org/resource/oer-africa-introduction-kenya-methodist-university-meru-january-2010>

In 2010, KEMU signed an MOU with OER Africa to create a framework that would support both parties to create a working partnership to enable joint pursuit of collaborative activities and projects specifically, in the area of Open Resources for Health.

AGRICULTURE

i. AgShare Project — SAIDE

<http://oerafrica.org/agshare>

AgShare is a partnership between various existing organizations and it aims at influencing them to create and openly share different types of OER that strengthen African MSc Agriculture curriculum and promote their use by other stakeholders.

ii. Commonwealth of Learning (COL)

<https://www.col.org/programmes/lifelong-learning-for-farmers>

COL is an intergovernmental organization created by Commonwealth Heads of Government to encourage the development and sharing of open learning/distance education, knowledge, resources and technologies. Its Lifelong Learning for Farmers (L3F) initiative has developed a model linking the capacity building of farming community particularly women through ODL and flexible learning and linked the process with social and financial capital.

iii. The Technical Centre for Agricultural and Rural Cooperation (CTA)

<http://www.cta.int/en/article/2014-09-11/imark-courses-to-become-open-educational-resources-and-be-more-visible-to-search-engines.html>

CTA is a joint international institution of the African, Caribbean and Pacific (ACP) Group of States and the European Union (EU). Its mission is to advance food and nutritional security, increase prosperity and encourage sound natural resource management in ACP countries.

HEALTH

i. Kenya Open Data Portal, Health Sector

<https://opendata.go.ke/browse?category=Health+Sector&utf8=%E2%9C%93>

The Kenya Open Data Portal makes Public Government health datasets accessible for free to the public in easy reusable formats supporting the Government's drive to proactively inform citizens and be accountable.

ii. African Health OER Network

<http://www.oerafrica.org/african-health-oer-network/about-us>

The African Health OER Network is co-facilitated by OER Africa. Its aim is to be a leader in sharing educational resources for health, dramatically expanding African health educators' global impact, influencing and strengthening the Network as a point of reference for learning and teaching materials for educators and learners across the African continent and ultimately worldwide.

PRIMARY AND SECONDARY SCHOOLS

i. School of Open Africa

<http://creativecommons.org/tag/school-of-open-africa>

The School of Open is a global community of volunteers that provides free education opportunities on the meaning, application, and impact of "openness" in the digital age and its benefit to creative endeavors, education, and research. The initiative has been launched in Kenya and students have integrated the training into their school work.

ii. Connect a School, Connect a Community — International Telecommunication Union Initiative (ITU)

<http://connectaschool.org/itu-module/15/391/4-5-5>

Connect a School, Connect a Community is a public-private partnership launched by ITU to promote broadband Internet connectivity for schools in developing countries around the world. Its Flexible Learning for Open Education project (FLOE) aims at supporting adoption of OER in Africa, where mobile devices are more prevalent than Internet access. FLOE seeks to create the tools and services needed to deliver OER via audio-only, text messages on small screens found on popular cell phones.

MULTI-DISCIPLINARY ORGANIZATIONS

i. OER Africa

<http://www.oerafrica.org/find-oer/oer-repositories>

OER Africa partners with several institutions and has developed diverse OER repositories in Agriculture, Health and Teacher Education.

ii. The African Economic Research Consortium (AERC)

<http://aercafrica.org/>

AERC is a public not-for-profit organization devoted to the advancement of economic policy research and training. It has partnered with OER Africa to develop courses for the Collaborative Masters of Agricultural and Applied Economics (CMAAE), which helps to strengthen local capacity for conducting independent, rigorous inquiry into the problems facing the management of economies in Sub-Saharan Africa

iii. Kenya Open Data Portal

<https://opendata.go.ke/>

The Kenya Open Data Portal makes Public Government datasets accessible for free to the public in easy reusable formats supporting the Government's drive to proactively inform citizens and be accountable.

iv. United Nations Institute for Training and Research (UNITAR)

<http://www.unitar.org/free-courses>

UNITAR is the training arm of the United Nations system whose mission is to develop capacities of individuals, organizations and institutions to enhance global decision-making and to support country-level action for shaping a better future. It offers courses that run throughout the year or several times a year that are free-of-charge and open to the public.

A. Atieno Adala

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of Open Educational Resources in Kenya**

UNESCO Institute for Information Technologies in Education

Moscow 2016



Dr. A. Atieno Adala is Manager, Research and Development at the African Virtual University (AVU), an intergovernmental organization headquartered in Nairobi, Kenya, that works with partner universities across Africa to enhance their capacity in open, distance and eLearning (ODeL) and leveraging ICTs to expand access to quality education and training in Africa. She is currently leading the implementation of the AVU research agenda in ODeL. This includes the establishment of an online open access peer-reviewed journal, convening the AVU international conferences and leading research in ODeL. Areas of research focus include open education resources, mobile learning, quality assurance and gender issues in ODeL. She is currently leading the research project “Assessing the impact of the adoption and use of OERs in Sub-Saharan Africa”, sub-project under the Research on Open Educational Resources for Development (ROER4D) project funded by the IDRC. She has published and presented her research results at various forums. She received her PhD in Instructional Systems Technology from Indiana University Bloomington. She was awarded the Compton Foundation Peace Fellow, the PEO International Education Fellow and American Association of University Women International Fellow.



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