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**Teachers and Schools
Principals at the Center of
Change in the School and in
the Classroom**

**Utilizing Open Educational Resources (OERs)
to Support Higher Education and Training
in Africa**

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**Working Document
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1 Abstract

This paper explores the potential and challenges associated with the development and use of Open Educational Resources (OERs) in support of Higher Education and Training in Africa. With many nascent OER initiatives underway, the paper suggests that a more cohesive and collaborative approach to OERs would be advantageous to all stakeholders.

Having established the rationale for OER use in African Higher Education, the paper then describes a framework for the development, management, distribution and utilization of OERs by a well supported network of stakeholders. The authors contend that the “AVU OER Architecture” involving the collaborative support for OER initiatives through targeted sensitization, capacity enhancement, technical assistance and the development of sound governance structures, is the most appropriate way forward. The alternative is a continuation of what is currently an *ad hoc* approach by stakeholders which may not result in the emergence of a strong OER movement in Africa.

The paper then offers a case study of one of several OER initiatives in which the AVU is currently involved. The MIT/OCW Pilot aimed at investigating how these materials might be made more widely available to African Universities. In doing so, a series of challenges and benefits became apparent - some expected, some not. The Chapter is based on an internal (AVU) report and while its focus is therefore limited to the MIT/OCW pilot project and the resultant strategic recommendations for the AVU, it highlights a variety of issues common to many OER initiatives in Africa. For this reason we have chosen to share it more widely. For readers from outside Africa, some of the challenges it poses may prove edifying indeed.

2 Introduction: The Case for Open Educational Resources

It is easy to think of Open Educational Resources (OERs) as a mere outgrowth of the online education model, as educational materials (usually digitalized, though not exclusively) that can be used anywhere, anytime by anyone for no cost.ⁱ However, such a determination risks oversimplifying the nascent OER movement. In identifying how OERs might contribute to effective higher education in the future the story of how OERs came to be requires further reflection. Though it bears similarities to its main predecessors, namely, the online distributed education model, the Free, Libre and Open Source Software (FLOSS) movement and the copyleft movement of the late 1990s, its genesis is a result of none of these in isolation. Rather, it is the progeny of several convergent developments.

The idea of OERs was born of technological advances enabling the creation, organization, dissemination and utilization of resources, the notion that education is indeed a right and of a paradigmatic shift in the intellectual copyright movement enabling and encouraging others to benefit from knowledge resources at little or no cost. In short, OERs contribute to the learning process what educators across the globe value as a guiding principle: a willingness to share knowledge.

In the context of the limited resources available to Higher Education and Training institutions in Africa, the OER movement has immense potential. However, despite the potential of the OER movement to increase access to education, issues remain which threaten to undermine the movement's expansion in Africa.

In his seminal work, *Pedagogy of the Oppressed*, Paulo Freire (1970) outlined a flawed perception which can act as an obstacle when it comes to providing a meaningful educational environment. The perception is of education as a 'banking structure' where the teacher (or in this case the medium through which information is transmitted: the internet) is the depositor (of information) and the student is the repository for it.ⁱⁱ An educational environment that lacks an interactive, or as Freire characterized it, 'problem-posing' atmosphere where the transmission of knowledge is multi-directional rather than asynchronous – cannot then, justifiably be considered education, rather, it is indoctrination. Instead of being emancipated, the learner is oppressed.

A similar view could be taken of the nascent OER movement, where information (in the form of OERs) has perhaps unjustifiably assumed the role of educator. Indeed, some have suggested the movement itself assumes a further connotation: that of the benevolent, developed country "providers" of OERs and passive, developing country "users" of them. Massachusetts Institute of Technology Linguistics Professor, Shigeru Miyagawa (2005), has cautioned that by not addressing these concerns, we may see a global information society that resembles "a map of the world in the 16th century, composed of those that colonise and those that are colonized."ⁱⁱⁱ

The promise of OERs, then, resides not only in the availability of digitized information itself, but also in developing the methodological approaches and mechanisms that manage and ascribe meaning to them in a variety of educational environments. The AVU believes this is best achieved through collaborative partnerships that focus on the four main elements of the OER evolutionary process: Creation, Organization, Dissemination and Utilization. The strategic combination of these elements within what the AVU terms the 'AVU OER Architecture' will lead to the development of a dynamic, meaningful, rational and comprehensive OER strategy for African higher education and training institutions. The following paper discusses some of the challenges that currently prevent the OER movement from progressing past its current embryonic state in Africa and some of the potential solutions that the AVU believes will enable it to do so.

3 Challenges for Developing OERs in African Universities

The articulation of the AVU OER Strategy stems from a variety of experiences with OER initiatives across the continent. For this paper the authors will concentrate on the AVU-MIT OCW Pilot Project Final Report ^(iv) conducted in East Africa and the AVU Gap Analysis^(v)- a study analyzing the Open, Distance and eLearning (ODEL) capacity of universities at 18 institutions in 16 African countries. The above elicited four fundamental challenges inhibiting participation in the OER movement: familiarity, technological infrastructure, capacity enhancement and governance structures.

3.1 Need for OER Sensitization

During the AVU-MIT OCW Pilot Project (described in further detail below), nearly every workshop participant was ‘unfamiliar’ with both the concept of OERs and the MIT OCW site itself. That said, 90% of those questioned replied positively to the open license concept and 95% of those respondents indicated they would refer the site to others.^{vi} It can be assumed then, that one fundamental challenge inhibiting participation in the OER movement is the unequal information flow in Africa on the subject of OERs. The AVU’s Gap Analysis outlined four prominent conceptions by African academics regarding the promotion of open content:

- lack of support from the relevant governing bodies exacerbating already poor participation,
- lack of clear quality assurance mechanisms that would result in unclear standards in OERs, (“if it’s free it must be rubbish”)
- potential for open content to be a ‘white elephant’ whereby significant start-up costs diminish enthusiasm, and
- ambiguous intellectual property rights policies leading to lack of faculty participation.^(vii)
- Should these concerns be neglected, the opportunity cost of non-participation in the OER movement inevitably increases.
- Insufficient technological infrastructure

Though OERs may theoretically be ‘open’ and ‘free’, the reality in the developing world, especially Africa, belies this perception. These resources are neither open nor free to those unable to access the basic, yet necessary infrastructure: computers and the internet. Results from the AVU-MIT OCW survey showed that 55% of students and 45% of educators still access the internet through Internet Cafes.^{viii} In many cases where there is a minimum connectivity, educators will pay a colleague or graduate student to source for the materials which everyone can share. The conclusion drawn by a recent survey by the United Nations University and Institute of New Technologies (INTECH) (Oyelaran-Oyeyinka *et.al*:2002) analyzing the uses of internet in African tertiary educational institutions, confirmed that the low level connectivity has led to an “arid Internet user environment.”^(ix) Optimistically, it noted that the desire for an online publishing and researching environment where student assignments, lectures and research can be conducted is significant. Indeed there is considerable evidence that creative ‘work-arounds’ even in this “arid” environment, have sprouted. Practical answers, such as store-and-forward email, extensive use of CD-ROMs, caching technology, pulling web pages through email and, most recently, the mirroring of OER websites and repositories on local area networks, have evolved to alleviate the stress on poor (or poorly managed) bandwidth. These solutions though are embryonic and have yet to realize the full potential of OERs.

While noting that individual African governments are making considerable progress, the proposed advent of the marine fiber optic cable around the continent of Africa will (optimistically) take three to five years to widely benefit African tertiary institutions due to high costs, poor terrestrial infrastructure, and lack of ICT policy that supports education both institutionally and nationally. Connectivity and its related issues are, in the implementation of the AVU OER Architecture, a key component.

3.2 Need for Capacity Enhancement in OERs

The AVU's Capacity Enhancement Program (ACEP)^x, a wide reaching initiative aimed at evolving and improving the Open, Distance and eLearning (ODEL) program development, delivery, management and financing capacity at AVU Partner Institutions in 29 African countries, commenced in March 2006. An initiative similar to this, whereby the development of skills and improvement of infrastructure are furthered through the combined efforts of leading organizations and learning institutions, is envisioned in regard to OERs. The program would encourage African participation in the OER movement in a manner that is beneficial to teaching, learning and research. Within this conceptual framework it is appreciated that each teaching/learning community will have its own approach to such a development effort: the OER capacity enhancement program will therefore encourage and incorporate the advice of those who seek to participate in its design and implementation.

3.3 Lack of Institutional Policies and Structures Governing OERs

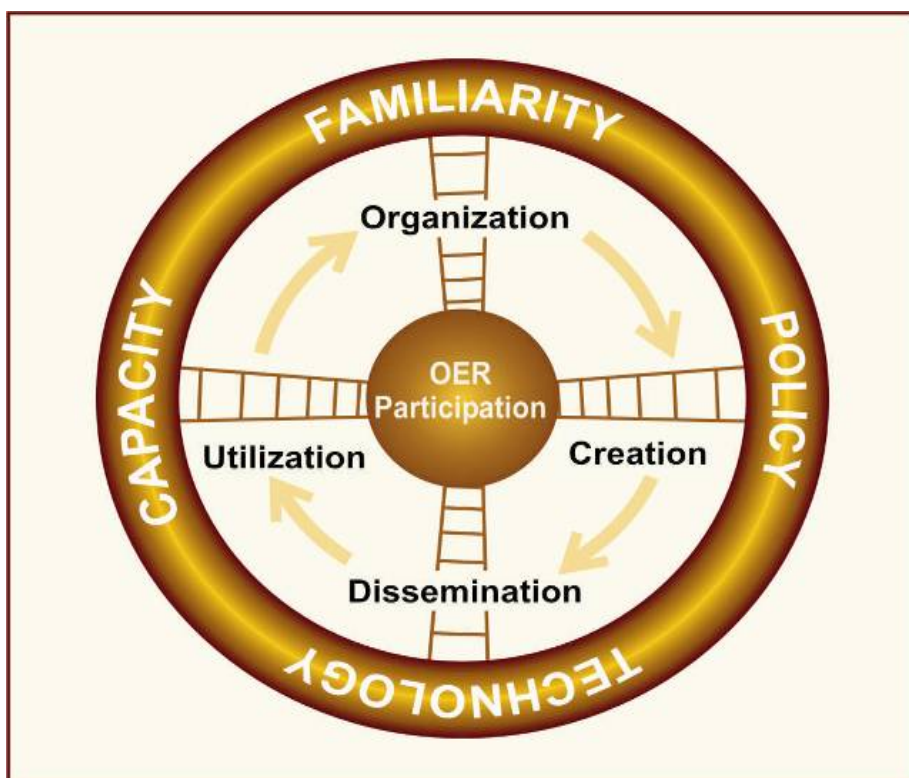
The proliferation of OERs in Africa has assumed no concrete structure; often it is individual-institutions or initiatives based and oriented along project-based criteria with little regard to the quality, legality, sustainability or future role of OERs. It is therefore necessary that the institutional governing bodies articulate a broad reaching governance structure for OERs. The AVU's Gap Analysis further concluded that as a result of the lack of any clear governance 'regime', "librarians are in some cases afraid of breaching intellectual property rights (IPRs) and could be erring on the side of limiting the use of available resources too much."^(xi) In response to this finding the AVU's IPR Guide for e-Learning Content Developers^(xii) recommended a consortium approach to IPR governance in sub-Saharan Africa so as to improve the flow of information across the AVU PI network. The importance of having "all members of a consortium agree on the IPR management and exploitation" was underscored in this report.^{xiii} Mechanisms such as those established by the Creative Commons may be of great assistance in this regard.

4 A Framework for OERs in Higher Education and Training in Africa

4.1 The Need for a Framework

As a result of its late ingress into the OER movement, Africa enters the arena having little to no experience in the OER evolutionary process (that is, in the Creation, Organization, Dissemination and Utilization of OERs) and with an undefined OER trajectory. Consequently, there is a need to mitigate against a very real possibility that African universities and other tertiary institutions may tend to participate as unequal recipients of content with little control over its origin, quality and appropriateness. By involving African institutions in the entire OER evolutionary process, issues and inconsistencies pertaining to epistemological, ideological, cultural and social relevance as well as technology related challenges are reduced while enabling these institutions to participate actively so that they drive and own the process in terms of form, content, quality, structure and orientation.

4.2 The AVU OER Architecture



The constituent parts of the AVU OER Architecture (Creation, Organization, Dissemination and Utilization) are held together by the abovementioned elements (capacity, familiarity, technology and policy). From this basic framework, the dimensions of the AVU OER Architecture are formed to create 'knowledge spaces,' in which meaning and information about OER initiatives and methodologies converge. These include spaces for knowledge creation and sharing, spaces for communities of practitioners (CoPs) in which they may actively engage in shared discourse and innovative basic and applied research pertaining to OERs, a space that provides practitioners access to articles, journals, and a space for accessing the Open Educational Resources of others. These 'knowledge spaces', however, are neither restrictive nor prohibitive entities; they are punctuated by hallways and paths allowing for the free flowing of ideas from space to space (i.e. between institutions and individuals forming the CoPs that are envisaged for OER practitioners in Africa and beyond).

Furthermore these virtual and physical spaces are vital lines of communication within the OER Architecture in that they are often the site of engagement, exploration, innovation and pilot testing of ideas around OERs. Indeed, they encourage and generate further discourses in and around the different spaces, gradually re-shaping new and strengthening old relationships within the network.

In this schema, it is important that the OER Architecture be flexible enough to allow and indeed facilitate future developments as the OER movement has yet to mature and will inevitably develop beyond its current limits. The growth of OERs in Africa then, relies on the free-flow of ideas, both within the 'hallways and paths' of African OER architecture and among the similar 'OER architectures' developing globally.

4.3 Why the concept of Architecture?

The purpose of the AVU's OER Architecture is to lay out the general components of the nascent OER movement in the AVU and on the African continent. The architecture is grounded in two experiences: a thorough analysis of the existing theories and perspectives concerning the global Open Content movement and the experiences of the AVU and others on the continent in establishing processes, systems and frameworks of design, development, management and sharing of OERs. The combination of these elements or building blocks constitutes the empirical and theoretical 'foundation' on which the AVU OER Architecture is based.

4.4 The Importance of Partnerships and Collaboration in Establishing a Sustainable OER Architecture

The AVU is keenly aware that there are many valuable OER initiatives taking place across Africa. These are emanating both from Africa itself and from OER partners abroad. While most of these are still new, there is immense interest in the potential of OERs in supporting and enhancing higher education and training in Africa. The AVU has established partnerships with many of these initiatives - so many that the organization now finds itself immersed in duplicated and sometimes conflicting efforts from key stakeholders that may well result in a less than effective model for OERs emerging.

In terms of establishing a 'critical mass' of interest in OERs this diversity of efforts is not necessarily a bad thing. However, a more coordinated and collaborative approach to the development of a strong, sustainable OER movement is now appropriate. The key challenge in establishing this movement will be not to quash or exclude the efforts of those partners we each seek to support. A variety of OER stakeholders involved in Higher Education and Training in Africa is already emerging and includes

- Open Content Initiatives
- Open, Distance and eLearning Initiatives
- FLOSS initiatives
- OER Policy and Advocacy Initiatives
- Connectivity and Infrastructure Initiatives
- OER Governance and Management (including IPR) Initiatives
- OER Donor Funding Initiatives

Those involved in the various initiatives above include national governments, intergovernmental organisations, NGOs, universities, researchers, the private sector, donors and interested individuals. Intrinsicly, by their very nature, OER stakeholders are looking for mechanisms and support structures (an Architecture) that will enable them to engage effectively and collaboratively in the OER movement. That is, in sharing what they are doing with others.

The identification and inclusion of these stakeholders in the development of an African OER Network that would focus on Higher Education and Training should therefore be the starting point. This Network could then work collaboratively on developing and refining a set of coordinated support mechanisms, policies, training initiatives, research initiatives, funding initiatives and the like that together would result in the sustainable development and use of quality OERs to support Higher Education and Training in Africa.

5 A Pilot Project: Establishing Mirror sites for MIT/OCW in African Universities

5.1 Project Objectives

The promotion of Open Educational Resources in Africa are a means to enable the AVU to meet its strategic objective of increasing access to quality higher education and training in Africa. It is in light of this that the Research and Innovation Facility (RIF), a unit within the Open Distance and eLearning (ODEL) Initiative at the AVU, in collaboration with the Massachusetts Institute of Technology OpenCourseWare (MIT OCW) undertook a pilot project that sought to increase the usage of OCW material in African universities. The objectives of the project were to:-

- Raise awareness of MIT OCW;
- Facilitate the usage of MIT OCW;
- Initiate the process of creating African based communities of practice for OERs.
- Provide research feedback data on the access and use of the OpenCourseWare in the context of an African institution.

Two institutions in Kenya and Ethiopia were selected to participate in the Pilot phase of this project (June to August, 2005) i.e. the University of Nairobi (UoN) and the University of Addis Ababa (AAU)

5.2 Pilot Components

5.2.1 Setting up mirror sites

MIT OCW provided external hard disk drives pre-loaded with the MIT OCW site, which included text, multimedia and other enhanced interactive content. MIT OCW also provided software to log and track usage of the material.

5.2.2 Sensitization workshops

The AVU facilitated the preparation and implementation of sensitization workshops at the selected institutions (UoN and AAU).

Students from the MIT-Africa Internet Technology Initiative (MIT-AITI), an innovative program started by MIT students to integrate computers and Internet technology into the education of students in African schools, were sent by MIT OCW to conduct part of the workshop in their 2005 summer program.

The MIT-AITI students conducted site visits to UoN in order to:-

- Conduct sensitization workshops for faculty and/or students on MIT OCW material;
- Install and configure the mirror sites and train site technical staff;
- Provide ongoing content and technical assistance as needed.

5.2.3 Learning support materials

MIT OCW agreed to work with publishers to collect donated textbooks and learning materials for selected academic programs. These were to be availed to UoN and AAU for selected courses in

information and communication technologies (ICTs), a discipline that has been identified as having the highest-demand in Sub-Saharan Africa.

5.2.4 Awareness campaign

The success of the summer 2005 pilot was partially dependent upon a successful communications campaign that:-

- spread awareness about the program, particularly among African educators and students;
- explained the background and purpose of OCW, including what OCW is and is not, and;
- Guided users on how to use the MIT OCW materials.

5.3 University Of Nairobi (UoN)

Kikuyu campus was selected to participate in the pilot because as it had a good working relationship with the African Virtual University. In the next few months the university will be conducting various AVU programs and activities, including the important AfDB supported Teacher Education Project.

Prof. Henry W. Mutoro, the Principal, College of Humanities and Social Sciences, was present to officially open the workshop on July 4th, 2005 at Kikuyu campus at a ceremony that was graced by the senior administration of the campus including the Principal, the Dean of External Studies, the Registrar and the Chairman of Extramural Studies.

Dr. Gakuu the Chairman of the Extramural Studies Department was instrumental in the organization of the workshop, and his office was used to convene a meeting of the educators during the workshop dates.

The workshop was split into two half-day sessions, one for the lecturers and the other for the students. Forty lecturers were invited to the workshop and about thirty participated. This was a good number considering that examinations were ongoing and lecturers' schedules were tight. The student session filled the computer lab beyond its capacity with over 75 students participating in the workshop on July 5th, 2005.

5.3.1 Challenges Faced at UoN

The AVU requested the AITI students to bring the external drives to the AVU offices prior to the pilot to enable all to familiarize themselves with the content and strategize on the workshop. It was at this stage that various challenges became evident.

The OpenCourseWare content, particularly the multimedia files, are huge with most of them being over 10 megabytes. It was found that the links in the mirror drive provided by MIT OCW still pointed to the files on the internet, the expectation seeming to be that users would be able to access the content directly from the Net, rather than from the mirror site, which had been our expectation. Fortunately, it was found that these files were also located on external hard drive. AVU staff located an ASCII "Search and Replace" tool on the Internet and used it to change the links to point to the relevant local files.

During the lab tests conducted at the AVU prior to installation of the mirror at Kikuyu Campus, it was also found that not all the necessary software was bundled together with the OCW content. Such required software included Adobe Acrobat Reader and Real Media Player. As this software is common to many users of Windows, perhaps the assumption had been that it would be found in the universities which are piloting this project. Unfortunately, this is not necessarily the case. The

installation manual was also found to be ineffective in aiding a technical person during a first time installation. This is evident from the various instructions that need revision.

An unexpected challenge was faced in the form of the university protocol in terms of informing all the correct university officials of the pilot project. This challenge was resolved through a series of meetings that were held with the Dean, Faculty of External Studies. The outcome of this was the much needed buy-in for the project by the senior administration of the university.

At Kikuyu Campus, computers at the lab intended to be used had earlier been stolen and only very recently replaced. This posed a challenge because the thirty (30) new computers were not yet fully installed and/or configured properly by the time of conducting the workshop and this rendered some of them temporarily unusable.

The mirror site is intended to be accessed via a local intranet. UoN does not have any server located at Kikuyu Campus and the infrastructure thrives on a peer-to-peer workgroup setting. This called for the installation of a web server to facilitate the installation of the mirror site. Internet Information Services (IIS), the selected web server software, was set up on a computer running windows XP. However, it then became apparent that a defect exists within IIS and Windows XP Professional in a windows workgroup environment that renders IIS unreachable from other computers within the workgroup. This challenge was overcome through the installation of Windows 2000 on the computer.

An unexpected power outage from the supplier, Kenya Power and Lighting Co (KPLC) coupled with a broken down generator at the campus, caused a blackout in the computer laboratory for about an hour at the beginning of the educators' workshop session. In many African institutions power remains a considerable challenge to the use of ICTs and other electricity-reliant technologies. The available computer lab at the campus was initially a disused kitchen. Much more needs to be done to convert the space to a modern and conventional computer lab with a cooling system, well arranged computer tables and regular maintenance. The school's administration is working hard to improve this very important facility and plans are underway to expand it.

5.4 Addis Ababa University (AAU)

Addis Ababa University was also selected to participate in the Pilot phase of the project due to its good working relationship with the African Virtual University. The AAU currently participates in the AVU Computer Science and Business Studies programs. Prof. Andreas Eshete, the AAU president, was receptive to the OpenCourseWare concept when initially invited to participate in this Pilot project. He delegated this activity to the ICT Development Office headed by Mr. Moges Delelegn. It was through this office that the mirror sites were centrally installed within the university and that workshops were organized and conducted.

Sensitization prior to the workshop was done by:-

- sending out to as many individuals as possible, invitation letters with marketing details of OCW;
- circulating brochures on MIT OCW and the AVU;
- posting invite posters prepared by the AVU at strategic locations around the AAU campuses;
- sending an email to ALL the AAU academic and administrative fraternity inviting them to register for the workshop;

By the eve of the workshop on August 26th 2005, registration had to be closed because of the large number of registrants and the limited available resources to conduct the workshop. All in all, over 100 academic and administrative staff from different faculties and departments had registered for the workshop on August 27th 2005. The ICT development office team with assistance from the AVU team in Nairobi played a key role in the success of this campaign.

With regard to the MIT OCW mirror site, the AAU ICT infrastructure is designed in such a way that all the campuses that are within reach of Addis Ababa city centre are interlinked either by fibre optic or DSL cable. The mirror site was set up on a central server on the network and can now be accessed from the over four thousand computers in offices and computer labs within the entire AAU ICT network. This provides the entire AAU community with access to OCW courses from a local URL.

Due to the large number of interested participants, it was necessary to conduct three workshop sessions rather than just one as anticipated. For each of the groups, a presentation on MIT's OpenCourseWare vision, project life cycle and usage statistics was made. The presentation also included a demonstration of the mirror site after which a question and answer session was conducted.

Participants were also requested to complete the feedback survey whose findings have been analyzed and appended to this paper.

5.4.1 Challenges Faced at AAU

The AAU pilot had been initially slated to be conducted in July, 2005. However, student unrest due to the political instability of Ethiopia immediately after the general elections made it impossible and unsafe for the pilot to be undertaken at that time. This resulted in the AITI students rethinking their participation following the initial sensitization phase. The AVU however decided to continue with the pilot at a later date by negotiating with AAU for a mutually acceptable time at which the workshops could be conducted by AVU staff.

Although there were no hindrances in preparing for the workshops once on the ground, there was a power outage on the very day of the workshop. AAU was well prepared however and a university bus was quickly availed to ferry participants to another location in different campus where there was power. This setback caused a delay of about an hour in the first workshop session. The second and third sessions were conducted in the original locations when power was restored on the same day.

5.5 Monitoring and Evaluation of the Pilot

Tracking of usage and access of the OCW content remains a challenge. The monitoring strategy is such that the technical personnel handling the OCW server need to send periodic log files in raw format to the AVU Research and Innovation Facility. These are then analyzed using the tracking system, AWStats. In addition, a baseline questionnaire was circulated to the workshop participants and an analysis of the completed questionnaires has been appended to this report.

The mirror sites can be tracked remotely by checking the daily usage statistics from a public URL. The AVU and MIT will regularly access this site in order to ascertain the site usage. This data will then inform future interventions and/or any planned expansion of the pilot.

5.6 Outcomes of the Pilot

The pilot project received immense support and a warm reception from participants at both UoN and AAU. The objectives set out for this pilot project were all met, save for the provision of learning support material from MIT OCW which is ongoing. The predominant criticism of the OpenCourseWare focused on the scope of the available content. Those participants, who did not find content specific to their domains within the OCW media, strongly raised this in their feedback as articulated in the feedback analysis section of this document. For the AVU, this indicates a strong need to expand the access to additional content areas from other OER developers.

An overwhelming majority of the participants admitted that prior to the sensitization workshops, they had not heard of the MIT OpenCourseWare initiative. Participants were also appreciative of the initiative that MIT has taken to open up their curriculum to the ‘outside’ world.

5.7 Sensitization of OpenCourseWare in Africa

MIT OCW should emphasize the sensitization of the OCW initiative within Africa. To effectively increase the access to OpenCourseWare from African Institutions, a marketing strategy that blends both online and traditional marketing methods, such as the use of face to face workshops and online media, should be encouraged.

5.8 Extending the OpenCourseWare Pilot Project

MIT OCW should continue to work in close collaboration with the African Virtual University, which has on-the-ground experience working with institutions in Africa, in order to provide adequate access to the MIT OpenCourseWare.

As a result of engineering and carrying-out the actual MIT Pilot Project, the AVU is very well situated to take the operation further with far greater scope. Over 90% of the respondents on both the UoN and AAU Educators survey responded very positively to the “open” license concept. The AVU would be keen to expand this pilot to other members of its network Africa-wide.

The AVU accordingly proposes to conceptualize a strategy/program that would broaden the MIT OCW concept through the development of an Open Educational Resources (OER) Architecture for institutions of Higher Education and Training across the entire African continent - certainly to those institutions with whom the AVU already has partnerships. Such collaborative/consortium programs are already in place with help from MIT: examples include; China Open Resource Education (CORE), JOCW (Japan OpenCourseWare) and, most prominently, Universia – a consortium of 745 Latin American universities.

The AVU looks forward to working with MIT and other stakeholders in playing a leading role in creating an Africa wide program to further the use of OERs.

5.9 Technical Recommendations for MIT/OCW

The AVU Research and Innovation Facility would like to make the following technical recommendations regarding the OpenCourseWare mirror sites:-

The links on the OCW mirrors need to be rechecked so that as much content as possible can be availed and linked within the mirror site and not from the main OCW Website on the internet. Specifically:-

- The akamai links should be pointed to the audio-visual content on the mirror site;
- Removal of the tracking script on the OCW home page;
- Minimal use of JavaScript especially to rotate content on page refreshing.
- In order to reduce the amount of time needed to set up a mirror site and eliminate problems of compatibility and operating system environments, the content should be shipped in a plug-and-play format complete with an operating system environment at the least.
- All fundamental software required should be bundled together with the OCW content in order to reduce the time to set up the mirror site and makes the mirror site maintainable. This includes:-
 - RealMedia Player (A download link should also be provided at the OCW mirror home page for easy access);
 - ActivePerl component;
 - Java engine to enable the use of the search facility. (Various comments were made regarding the availability of the search service on the mirror site);
 - Guidelines on how to set up the search engine locally using the Java Server Pages for the search facility;
 - Tracking software that has been preconfigured and accompanied with an OCW-specific installation document manual.

The packaging of the OCW material for installation and use on local mirror sites (i.e. portable, external media) makes it vulnerable to physical loss and/or damage resulting from constant movement and poor maintenance. A storage media such as an internal hard disk is the better option although more care needs to be taken when handling and shipping. The AVU believes the cost of the media provided for this pilot is more expensive than the internal IDE hard disk that being recommended.

Research on various modes for remotely updating content and receiving feedback via a cost-effective asynchronous channel, needs to be undertaken. This will enable MIT to update the content on the mirror sites from a central yet remote location. Some of the technologies that can be explored in this field include the use of WorldSpace data services and the use of CD media with new or updated courses.

To increase buy-in of the OCW material, the mirror site should be configured in such a way that it is very flexible to edit the web template in its entirety to match with the institutions requirements. The AVU suggest that an easy to edit site template be developed for the OCW mirror or; a quick guide to changing the look and feel of the mirror site and 'localizing' it.

The AVU also suggests that localized sensitization of the installed OCW mirror site is considered through the constant use of marketing material such as brochures, posters and leaflets to keep up the momentum of use.

6 Conclusion

This paper has examined the potential and challenges of the development, organization, dissemination and utilization of OERs for Higher Education and Training in Africa. It suggests that the development of an OER Architecture could be the most effective way of supporting the nascent OER movement in Africa. Such an OER Architecture would involve a variety of stakeholders in the development of an African OER Network that would work collaboratively towards fulfilling the potential that OERs present for supporting Higher Education and Training in Africa.

The AVU has offered the services of its Research and Innovation Facility (RIF) to coordinate the establishment of a steering group that would initiate the development of the OER Network described above. To this end the RIF has arranged a one day seminar to take place in conjunction with the “1st International Conference on ICT for Development, Education and Training”, to be held at United Nations Conference Centre in Addis Ababa, Ethiopia, from May 24 to 26, 2006^{xiv}. During the seminar on the 24th May the AVU would like to avail OER stakeholders the opportunity to explore further the ideas presented in this paper in general and in particular the establishment of an OER Network for Higher Education and Training in Africa.

7 Appendix I: MIT/OCW - Pilot Project Feedback Analysis

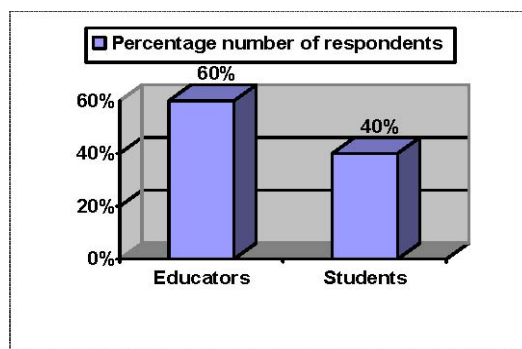
At the conclusion of the sensitization workshops at the University of Nairobi and Addis Ababa University, a survey questionnaire was circulated to the participants. The objective of the survey was to find out what factors affect the access to and use of the MIT OCW material. This is in light of seeking to ascertain if there has been an increase in the number of website hits on the OpenCourseWare website received from Sub-Saharan Africa prior to the installation of the mirror sites and that accounted for only 0.8% of the total global hits. Two versions of the questionnaire were circulated accordingly: a student questionnaire, and an educator questionnaire

The results of the surveys evince clearly identifiable issues which are in some cases irrespective of the education level of those questioned. The following is an analysis of the data collected using the questionnaires.

7.1 Sample Description

A total of 110 questionnaires were completed by 85 educators and 25 students. There were 20 educators from UoN, 65 educators from AAU and 25 students from UoN who completed the questionnaires. No students participated in this pilot project from the AAU.

Due to logistical problems coupled with the overwhelming number of participants that had not been anticipated, not all the participants got a chance to complete the questionnaire.



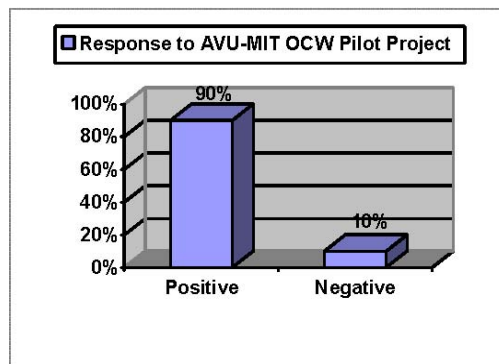
The most prominent disciplines that were represented in the sample size were civil engineering, life sciences and education.

MIT OCW Statistics - There were 3.8 Million hits from Sub-Saharan Africa accounting for a 0.8% of the total hits since January 01, 2003

The average level of education was post graduate (Master's Degree). The overwhelming majority of students that responded were at an undergraduate level (85%).

Several faculty members had been cognisant of the open license concept but were not aware of how it could affect their own work; i.e. what value – or challenges it added to their own careers.

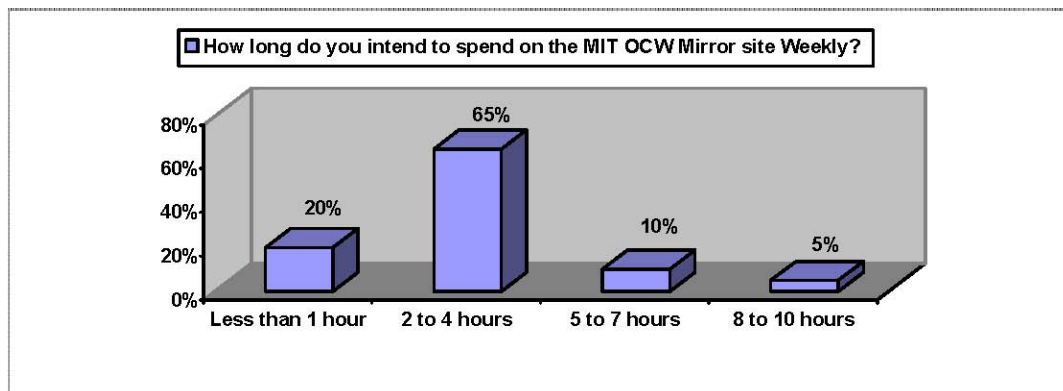
7.2 Feedback on the AVU-OCW pilot project



The feedback from the AVU-OCW Pilot Project was overwhelmingly positive. Over 90% of respondents held a positive opinion towards the OCW initiative. Faculty were receptive to the “open” license movement in general and were eager to learn more about other initiatives. The remaining 10% who responded less positively were participants teaching or learning in disciplines not available on the MITOCW as of the date of the Pilot Project. It is envisaged that this sentiment may shift when or if additional disciplines are developed and provided for in the OpenCourseWare website.

When asked whether the MITOCW site would increase their motivation to learn, improve their learning and whether they would recommend the site to others, 99% responded positively. Over 80% of the students foresaw spending at least 2-4 hours per week on the site.

The students were eager to use the resources available and anticipated spending considerable time on the site in the future in order to augment their studies.



7.3 Feedback on the MIT OpenCourseWare website

In an effort to better understand the barriers that restrict access to the MIT OpenCourseWare website in sub-Saharan Africa, the survey questioned, amongst other things, the usability of the site itself, the packaging and maintenance of the site, the availability and adequacy of computer facilities and the prevailing internet connection.

Some respondents also indicated that a hard copy of the handbook be made easily accessible and readily available throughout their institution for quick reference would be beneficial both for future workshops and personal use. More people wanted further instruction on how to manipulate the site to their own personal educational benefit.

There were questions during the Q&A session about the updating, packaging and maintenance of the site as well. As the mirror site is a static, non-updatable entity, several faculty members questioned how the site would stay current. Some suggested, and indeed, requested a CD Rom or Zip File version of their own, so as to install it on their own computers.

Criticism that emerged with regard to the actual availability of content on the website was largely exclusive to the relative, and inevitable, limitation of resources in specific subject areas such as: pathology, radiology and immunology.

7.4 Challenges to MIT OCW in Sub-Saharan Africa

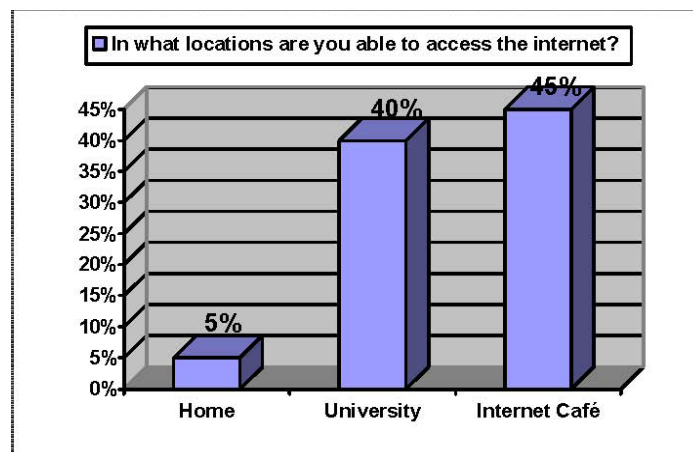
As mentioned previously, any discussion concerned with access to both education and technology in Africa inevitably calls for further reflection on fundamental challenges that beset African higher-education.

7.4.1 Access to the use of ICT Infrastructure

The lack of adequate ICT facilities coupled with poor bandwidth at both the University of Nairobi and Addis Ababa University campuses was and remains a major challenge to the use of Open Educational Resources. The OpenCourseWare materials although of very high quality are embedded in huge data files comprising long video lectures and huge text files. Downloading such material on a slow connection is a daunting and undesirable process.

Many of those who responded to the survey had limited access to a computer facility. Still more did not have regular access to the internet. The theme of low internet connectivity and lack of adequate ICT resources manifested itself in results concerning computer literacy.

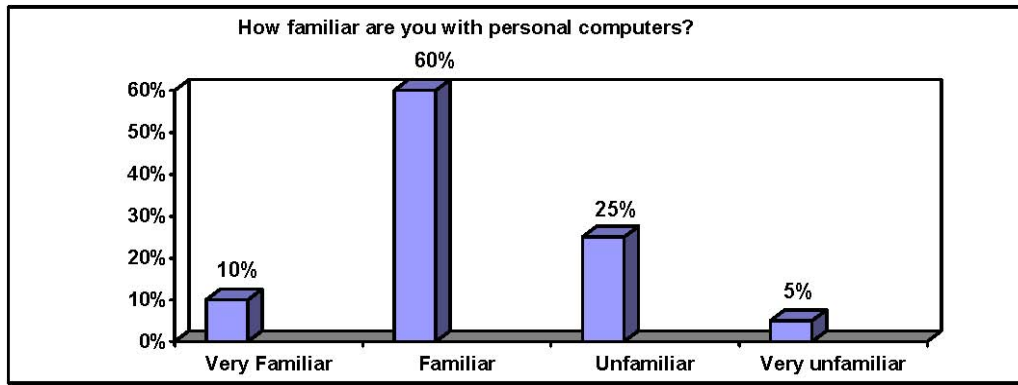
Respondents were largely dependent on either costly access to Internet Cafés (45%).



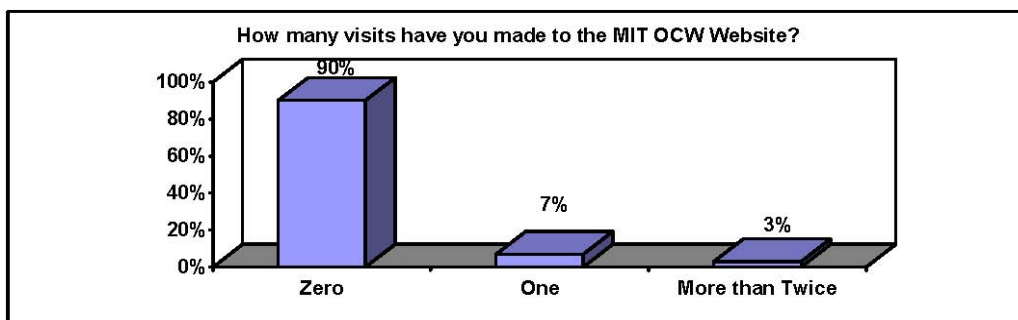
It was further noted during the students' workshop that they almost immediately drifted to surfing the internet especially accessing free email services such as Yahoo and Hotmail. This is a characteristic that can be attributed the limited computer interaction hours that deprives many, especially students of the largely assumed email communication. It may therefore be assumed that once a student has access to a computer, their priorities may lie elsewhere.

7.4.2 Low Computer Literacy

Nearly 30% of the respondents were either "unfamiliar" or "very unfamiliar" with personal computers.



Prior to the Pilot Project, nearly 90% had never heard of or seen the site before. This was consistent both with faculty members and students.



Of the remaining 10% who had prior knowledge of the website, over 50% had been made aware of its existence through the AVU's sensitization campaign – an intense publication event involving posters and brochures executed during the lead up to the workshop. This lack of familiarity can be attributed to a number of different factors: first, the structure, format and file size of content on the site precludes those with poor bandwidth from accessing the material; second, the limited visibility and marketing of the site within institutions; third, the availability of reliable and adequate computer facilities.

Several respondents further suggested that the MIT OpenCourseWare site be availed at several other institutions, thereby building the recognition not just in and amongst educators and students in a single institution, but also among several different institutions nationally.

7.5 Comments from the Respondents

Some of the comments that the respondents to the questionnaire made were:-

“People can reject the force of an attacking army but not an idea whose time has come. That's brilliant.”

“It is the best opportunity to get reference materials for teaching...So, it is much appreciated.”

“I plan on using the site to better my MSc. Education for the coming year.”

“Possibilities of making the material available on CDs should be investigated.”

“The MIT OCW material helps the developing countries in Africa to be more informed.”

“It would be helpful to have a zip file containing all the lectures notes on a subject...”

“Now MIT OCW knowledge is no more a monopoly of a few academics”

“That was really a great job. I didn’t believe that I have access to MIT’s course materials. Thanks a lot”

“It s a very fantastic approach to help instructors, researchers and students... to upgrade out textbook –based knowledge and acquaint ourselves to new ideas in a tailor-made form. Thanks a lot for such initiation”

“It’s unfortunate that the MIT OCW does not contain materials that are directly related to me, namely the Pharmaceutical sciences”

“This is a good initiative and needs to be encouraged”

“This was my ambition especially when I have to get resources easily. Thank you”

“It is best, please add more resources than exists here and on different levels”

“... we will help our staff and students to utilise the resource”

“The idea of free open courseware is good for poor countries of the world. It will surely bridge the digital divide”

“MIT OpenCourseWare is simple and valuable. But I will forget if I do not have more practice. I will need it near me at Chiromo (another UoN) campus”

“You need to conduct more workshops or seminars especially to University of Nairobi

8 References:

- ⁱ Some have argued that the OER movement has been characterized unjustifiably as analogous to the “kid’s stealing music” movement, where all content on the internet is seen as ‘free’ or ‘open’.[Wales, Jimmy, Newsweek Special Edition; (December 2005- February 2006), pg. 83]. Further complicating the debate is the lack of a definitive definition of “open”, leading, perhaps, to a debate that relies too much on “intuitiveness”.
- ⁱⁱ Freire, Paulo, *Pedagogy of the Oppressed*, Continuum Publishing Company; (1970).
- ⁱⁱⁱ Miyagawa, S. (2005) Presentation on MIT Opencourseware at the 16-17 May 2005 Tokyo Ubiquitous Network Conference as quoted in: <http://www.onlinelearning.unu.edu/Resources/UNU-OL9.pdf>.
- ^{iv} *AVU-MIT OCW Pilot Project Final Report*, African Virtual University – Research & Innovation Facility, (9/21/2005).
- ^v *ODeL Gap Analysis Report*, The African Virtual University – ODeL Initiative, (26/7/2005).
- ^{vi} *AVU-MIT OCW Pilot Project Final Report*, African Virtual University – Research & Innovation Facility, (9/21/2005) pg. 16.
- ^{vii} *ODeL Gap Analysis Report*, The African Virtual University - ODeL Initiative, (26/7/2005), pgs. 6-8.
- ^{viii} *AVU-MIT OCW Pilot Project Final Report*, The African Virtual University – ODeL Initiative, (9/21/2005) pg. 18.
- ^{ix} Oyelaran-Oyeyinka, Banji & Nyaki Adeya, Catherine United Nations University & Institute for New Technologies, Discussion Paper Series – *Internet Access in Africa: An Empirical Exploration*, May 2002.
- ^x For further information see: *African Virtual University’s Capacity Enhancement Program (ACEP) Phase I*, The African Virtual University, ODeL Initiative, (9/9/2005).
- ^{xi} *ODeL Gap Analysis Report*, African Virtual University - ODeL Initiative, (26/7/2005), pg. 6.
- ^{xii} *IPR Guide for AVU Consortium e-Learning Content Developers*, African Virtual University, (1/8/2005)
- ^{xiii} *IPR Guide for AVU Consortium e-Learning Content Developers*, African Virtual University, (1/8/2005), pg. 10
- ^{xiv} More information is available at <http://www.elearning-africa.com>