

OpenZambia: Improving the Quality of Education at the University of Zambia

Abstract

My project uses Internet and Communication Technologies (ICTs) to improve the quality of education received by students at the University of Zambia. The first part of the project involves installing and configuring a mirror site of the MIT OpenCourseWare (OCW) website and holding seminars on the history, use, and other details of OCW. This part focuses on providing students and educators with free, open, and easy access to the OCW materials, materials that would otherwise be unavailable because of low bandwidth, high cost internet connection costs, and poor internet connectivity. Educators can integrate the MIT course materials available on the OCW website into their curricula and raise the quality of education that they provide to their students. The second part of the project involves the configuration of an iLabs online laboratory and the completion of an iLabs seminar, which will allow students from the University of Zambia to remotely carry out experiments that would otherwise be unavailable due to inadequate laboratory facilities and prohibitive costs of the required lab equipment. Similar to the motivation behind the OCW mirror site configuration, the iLabs online laboratory will allow educators to extend and improve their current curricula. The OCW and iLabs seminars will couple by focusing on a single circuits and electronics course. This way, the educators and students can understand how OCW can be used as a resource for course content and how iLabs can be used to run real-time experiments covered in the OCW materials. Both parts of the project aim to introduce students and educators to free educational technology systems in order to advance their knowledge and quality of their own lives. I will be leading the entire project, which will primarily take place over two weeks of IAP and cost a bit over \$2000. I installed and configured a mirror site of the OCW website and gave OCW seminars to the administrators and students this past summer in Kenya so I am highly qualified for the project, having previously done half of the proposed project.

Introduction

According to the International Bureau of Education (IBE) and United Nations Educational, Scientific, and Culture Organization (UNESCO) there are two main universities in Zambia: the University of Zambia (UNZA), with nine faculties, and the Copperbelt University (CBU) with 6 faculties¹. The quality of a university education has declined significantly over the past few decades. The qualified staff from the universities have moved into other sectors and other countries, where they earn higher salaries and experience better working conditions. IBE and UNESCO further emphasize the magnitude of the rapidly declining quality of education in the following lines: “Between 1984 and 1994, the universities lost about 210 lecturers, of whom 60% were Ph.D.

¹ <http://www.ibe.unesco.org>

holders. Replacement of qualified staff is difficult and costly. Because of the loss of academic staff, the few that are available are over-extended, thus jeopardizing the quality of teaching and research.” In other words, the number of qualified teachers in Zambia has been declining, decreasing the quality of education that students at the University of Zambia receive.

Additionally, students at the University of Zambia have little access to educational materials outside their teaching staff, due to prohibitive costs of such materials and low internet bandwidth and connectivity. The cost of laboratories and laboratory equipment is similarly prohibitive, especially if we take into considerations the fact that these institutions do not have sufficient funding to provide competitive wages to their staff.

In order to address these issues of declining educational quality in Zambia, the project aims to provide easy and open access to MIT OCW materials through an MIT OCW mirror site and set up an iLabs online laboratory at the University of Zambia, the top university in the country. MIT OCW is a free and open education resource for faculty, students, and self-learners around the world. It supports MIT’s mission to advance knowledge and education by offering a free online publication of MIT course materials, including lecture notes, videos, and other forms of multimedia. iLabs is dedicated to creating online laboratories and enriching the science and engineering education of students worldwide by expanding the range of experiments that students are exposed to in the course of their education. With the implementation of an iLabs laboratory at the University of Zambia, students can use expensive lab equipment and educational materials, thereby further improving their educational experiences and the overall quality of their education.

Plan of Action

The project will be primarily based in Zambia, although the majority of the preliminary details, such as logistics, will be planned at MIT. The project will last over the course of two weeks in Zambia, by which point both the OCW mirror site and iLabs online laboratory as well as their respective seminars will have been completed.

MIT Timetable

The time spent at MIT will include six weeks of gathering materials, making all the logistical preparations, and planning the seminars for Zambia. I will first finalize all of the details on housing, food, and transportation arrangements, the exact dates and times for the mirror site configuration and online laboratory setup and their respective workshops and seminar, and purchase the roundtrip airline tickets. This task involves contacting the administrators at the University of Zambia to determine all the travel and event dates.

Next, also while at MIT, I will meet with Steve Carson, the MIT OCW Senior Strategist, and Jesus del Alamo, professor of Electrical Engineering and Computer science who helped found iLabs. I will work with Steve Carson on getting the external hard drive and

workshop materials and with Professor del Alamo on the details for setting up the iLabs online laboratory and for running the iLabs seminar.

Zambia

The portion over the project in Zambia will include two weeks of setting up the iLabs online laboratory, configuring the mirror site of the MIT OCW website and holding seminars for the students and the educators on both iLabs and MIT OCW. Once I arrive in Zambia, I will spend the first week installing and configuring the OCW mirror site and setting up the iLabs online laboratory. I will fully test the mirror site and online laboratory to ensure that they are functioning correctly and will then do dry runs of both the OCW workshop and the iLabs seminar.

During the second week, I will hold both the OCW workshop and iLabs seminar. I will also conduct follow-up site visits as necessary and provide ongoing technical assistance to the university educators and staff.

The timeline of events for the proposed project is as follows:

November 2005

Contact the administrators at the University of Zambia to

- finalize all details on housing, food, and transportation
- determine exact dates and times for the mirror site configuration, online laboratory setup, and the workshop and seminar
- purchase roundtrip airline tickets

December 2005

Meet with Steve Carson to get the external hard drive and workshop materials

Meet with Professor del Alamo on the details for setting up the iLabs online laboratory and for running the iLabs seminar

Finalize all trip details (trip dates, housing, etc.)

January 2006

Week 1: Install and configure the OCW mirror site

Set up iLabs online laboratory

Full testing of the mirror site and online laboratory

Dry runs of the OCW workshops and iLabs seminar

Week 2: Hold OCW workshop

Hold iLabs seminar

Conduct follow-up site visits as necessary

Provide ongoing technical assistance

Impact of Project

With the successful completion of the MIT OCW mirror site configuration and the workshops, students and teachers will have open and easy access to OCW materials, access that would otherwise be unavailable, due to low bandwidth and limited internet connectivity. The project will also raise awareness about MIT OCW and help students and educators realize the full potential of OCW materials.

With the successful configuration of an iLabs online laboratory and completion of the iLabs seminars, students from the University of Zambia will be able to remotely carry out experiments and characterize transistors and other microelectronic devices using the internet (experiments that would otherwise be unavailable due to inadequate laboratory facilities and be prohibitive because of cost). The project will also allow professors to use the iLabs online laboratory to extend and improve their current curriculums.

The MIT OCW mirror site and iLabs online laboratory can achieve a significant positive impact on teaching and learning in Zambia by providing students and educators with amazing educational tools and resources. One of the most amazing aspects parts of this project is that once both the MIT OCW mirror site and iLabs online laboratory are set up at the University of Zambia educators and students can continue using them beyond the completion of the project.

Project Goals

My primary goal for this project is to improve the quality of education of students at the University of Zambia. With the help of these free open-source systems, the students from the University of Zambia can advance their knowledge and equip themselves with the tools and resources necessary for obtaining employment in the world internet technology market and for improving their own lives.

I am focusing on this specific project due to my fascination with Information and Communication Technologies (ICTs) and their applications problems in underdeveloped communities, specifically issues related to education. This project aims to improve the quality of education in sustainable ways. Once educators have these the OCW and iLabs resources available, they can continually integrate them into teaching materials, thereby teaching at a level comparable to that of world-renowned institutions. Students will also have a wealth of resources available to them with which to improve their own educational experiences. Finally, the project has much potential for growth and expansion. The University of Zambia can provide access to its learning materials for other educational institutions in Zambia, leading to a higher quality of education in Zambia. This model can also be extended to other African colleges and universities, further improving the quality of education in Africa and other developing nations. With access to these resources, students and educators will not only be able to improve the quality of their own educations but also their economic, political, and social situations.

Team Qualifications

In the summer of 2005, I traveled to Kenya as part of the Africa Internet Technology Initiative (MIT-AITI). MIT-AITI is a student-run initiative which aims to bridge the digital divide between developed and developing nations by sending teams of MIT students to teach intensive, MIT-style 6-week courses in Java and Entrepreneurship at African High School and Universities. An additional component of the summer program this year was working on a pilot program with the African Virtual University (AVU) and MIT OCW. As part of the pilot, MIT OCW provided our team with external hard drives pre-loaded with the complete MIT OCW materials, including all videos and other multimedia and enhanced content. One of my team members and I used an external hard drive to install and configure a mirror site of the MIT OCW web site at the University of Nairobi, Kikuyu campus in Kenya. Following the mirror site configuration, I held two workshops – one for faculty and one for students – explaining the history, purpose, and details of MIT OCW and providing a guide on using the MIT OCW materials. Thus I have already performed most aspects of the program I propose in Zambia.

The pilot program was very successful. The configuration of the mirror site provides the students and administrators at Kikuyu campus with open and easy access to all of the multimedia and other materials available on the OCW site. In a few seconds time, a user can stream an entire video lecture from the local mirror site. The workshops were also well-attended, considering the size of the lab facility available, with 15-20 administrators present at the first workshop and 25-30 students present at the second workshop. The presentations at the workshops raised awareness about the various aspects of MIT OCW, including what it is and is not, its purpose, and potential uses.

Throughout the course of this term, I will work closely with Professor Jesus del Alamo to determine all the logistics of setting up an iLabs online laboratory at the University of Zambia. We will also work together on putting together seminars, which outline the history, purpose, impact, and scope of iLabs and include a live demonstration of using the online laboratory materials.

Attached is a copy of my resume along with the funding proposal.

Budget

The preliminary budget for the project is as follows:

Expense	Description	Details	Cost
<i>Roundtrip Airfare</i>	Boston to Lusaka	Roundtrip flight based on Orbitz rates	\$1,623
<i>Housing</i>	Ku-Omboka Backpackers Hostel & Guest House*	\$7 a night for 14 days	\$98
<i>Food</i>	Breakfast, Lunch, and Dinner	\$15 a day for 14 days	\$210

<i>Inland Transportation</i>	To and From University of Zambia	\$5 a day for 14 days	\$70
<i>Visas</i>	Zambia Visa	One time fee	\$25
<i>Vaccinations/Medicine</i>	Yellow Fever Vaccine (required) and Malaria Medicine	Estimate	\$150
<i>One Time Fees</i>	Airport Tax	Departure airport tax	\$20
	Incidental Expenses	For 14 days	\$50

Total: \$2,246

* *Full Housing Address:*

Ku-Omboka Backpackers Hostel & Guest House
Plot 9926, Mankanta Close, P.O.Box 33284
Lusaka, Zambia

MIT OCW will provide the external hard drive with the Open Course Ware content free of charge and I will borrow a projector from MIT for the OCW workshop and the iLabs seminar.

Supervision

My supervisor for the project will be Professor Shigeru Miyagawa, my professor in 21F.034 - Media, Education, and the Marketplace. I will also work closely with Stephen Carson, Senior Strategist for MIT OCW, and Jesus del Alamo, professor in Electrical Engineering and Computer Science who helped develop iLabs.