**FRONTIERS OF KNOWLEDGE
IN SCIENCE AND TECHNOLOGY
FOR AFRICA**

UNIVERSITY LEADERS' FORUM
UNIVERSITY OF CAPE TOWN

Grants for ICT Curriculum Innovation and Application

May 2007

In response to the Request for Proposals for Grants for ICT Curriculum Innovation and Application, 44 eligible proposals were received by the March 2 deadline. This ICT Curriculum Innovation and Application grants program is to support follow-up projects that build on the University Leaders' Forum held in November 2006 and hosted by the University of Cape Town.

The Selection Committee, chaired by Phillip Griffiths,[1] reviewed all proposals and recommended the following seven proposals for funding for a total of $350,000. On 27 April, the Partnership for Higher Education in Africa foundation presidents accepted the recommendations of the Selection Committee and grant awards were made in early May. In addition, the Selection Committee recommended that another five proposals receive consideration by individual foundations. Abstracts of these "honorable mention" proposals start on page 7.

These seven projects for ICT Curriculum Innovation and Application will be monitored and an effort will be made to promote cross-fertilization of ideas and the building of a knowledge base.

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[1] See the list of Selection Committee members in Appendix A.

Proposal Abstracts of Grants Awarded

Low-class Communities Income-generating e-Business

Institution: Faculty of Computing and IT (CIT), Makerere University, Kampala, Uganda
Principal Investigator: Professor Hippolyte N. Muyingi, Faculty of Computing and IT
Proposal Summary:
The project's objectives are to increase the income-generating potential of rural communities in Uganda, specifically women involved in the production of local crafts, and to provide rural communities access to cash through mobile telecommunication end-point service providers in their immediate reach. The project aims to leverage the appeal of African artifacts and cultural goods in the global market through the implementation of a web-based portal for selling artifacts created by rural African women. BSc and MSc students, ICT researchers and women micro-entrepreneurs will collaborate to design and launch an online African Artifact shopping mall (OLAAS) with secured transactions. Additionally, CIT will create a framework for implementing a money transfer service for rural communities using an existing mobile telephone network in Uganda. ICT researchers and MSc students will design a functional architecture and protocol for using airtime vouchers as a means of transferring money within Uganda. They will design, implement, test and validate an application software package for UTL mobile service.

Survey Data Collection Using Mobile Phone

Institution: Makerere University
Principal Investigator: Mr. P.A. Bagyenda, Head of Department, Department of Innovations & Software Development (DISD); Faculty of Computing and IT
Proposal Summary:
Makerere University will implement a mobile-phone based application for the collection, validation, and management of health sector surveys in rural/remote environments. The planned mobile application will enhance the existing Epihandy Survey Data Management Suite by building more generic data collection, transfer, and storage Application Programming Interfaces (APIs) based on Open Source and/or Open Standards concepts. To this end, a mobile phone client application will be implemented based on J2ME and/or Symbian platforms. Students from the Faculty of Computing & IT will be involved in system design, development, testing and deployment. In leveraging the capacity for cost-effective health survey data collection, this project invests in ICT to improve access to quality healthcare in rural communities.

ICT Curriculum Innovation and Application in Field Epidemiology Programme

Institution: School of Public Health, Faculty of Health Sciences, University of Witwatersrand, South Africa
Principal Investigator: Professor Sharon Fonn, School of Public Health
Proposal Summary:
The University of Witwatersrand will develop, test, and deliver a "virtual classroom" to connect the Wits School of Public Health (SoPH) in Johannesburg with rural demographic surveillance system field sites (DSS sites) at Agincourt and the Africa Centre (South Africa), Ifakara (Tanzania), and Navrongo (Ghana) to allow for real time face-to-face teaching of students on the MSc Population Based Field Epidemiology Programme. The U of Wits will undertake the following initiatives: (1) Improve the existing virtual learning technology by

extending it to link remote teaching locations. A Digital Lecture Hall in the Wits SoPH computer lab was created during the first phase of this project. (2) Provide a solution, in terms of bandwidth and reliability, for remote DSS sites (3) Install technology in each of four DSS sites (4) Create a sustainable knowledge base on the findings of this project for use in future endeavors, and (5) Investigate the potential of mix-mode transmission to accommodate bandwidth limitations in Africa. This project seeks to provide the appropriate and innovative technological infrastructure necessary to enhance teaching and learning capabilities in the African context and contribute to health and population wellbeing on the continent.

Initiative for Digital Educational Content Development

Institution: The University of Education, Winneba
Principal Investigator: Professor Jonas Akpanglo-Nartey, Coordinator, Externally Funded Projects
Proposal Summary:
The broad goal of UEW's project is to encourage the UEW community to become up-loaders of content. Specifically, UEW wishes to engage the Ghanaian university community in Digital Open Educational Content Production. To achieve this goal they propose to: (1) establish a Technical Support Centre to aid in the creation of a local Content Storage Server for UEW and the broader community; (2) develop and test a curriculum to include a step-by-step procedure for content development; (3) establish a Certificate Programme for Educational practitioners in Africa with a focus on Wiki education; and (4) Produce content that will lead to the expansion of UEW's Distance Education programme beyond Ghanaian frontiers to meet global standards. The proposed project will also extend UEW's outreach work in collaboration with FLOSS4Edu, an Africa-wide initiative to promote the development of African Educational Content in Open Formats. The project will also partner with oneVillage Foundation to expand the Open Digital Villages programme across Africa.

Academic-Industry Application of Remote Online Laboratory Technologies

Institution: Obafemi Awolowo University, The iLab Research Group
Principal Investigator: Professor Lawrence O. Kehinde, PhD, Director, Department of Information Technology and Communications Unit (INTECU)
Proposal Summary:
Obafemi Awolowo University will extend the use of technologies similar to MIT's iLab architecture to Nigerian universities and to selected corporate bodies. OAU will pursue four strategies to achieve their goal: (1) introduce the iLab concept to three groups of participants: one university in each geopolitical area of Nigeria, The National Open University of Nigeria (NOUN), and at least one corporate entity. OAU will conduct workshops, develop literature and organize forums to this end. (2) Help participating universities enhance their curriculum through the use of iLabs. OAU will develop one new iLab, secure the interest of participants and conduct technical support visits to participating universities. (3) Assist the NOUN to develop a viable experimentation component through the use of iLabs while ensuring that iLabs are geared towards supplementing students' skills in the identified areas of skills gaps. (4) Form a viable OAU-Industry partnership by developing new iLabs with the participation of a selected company to ensure more involvement of Industry in the process of developing their future intakes. OAU believes that

these four strategies will enable participating universities to enhance their Science and Engineering curriculum while also helping to form a viable OAU-Industry partnership.

Using ICT Solutions to Empower Visually Challenged Learners

Institution: Kenyatta University
Principal Investigator: Theodorus Gerardus Groenewegen
Proposal Summary:
Kenyatta University will test and possibly further develop a special instructional technology for the visually impaired and for the training of trainers of the visually impaired, utilizing available technology in Kenya and eastern Africa. KU plans to develop innovative software, hardware, voice and tactile graphics outputs that will enable the visually handicapped to gain equitable access to ICT The project will train the trainers of the visually handicapped in using this technology in their work. In addition, KU proposes to pilot the usage of this technology in special and integrated schools and assess the impact on learning technology. The specific objectives of the project are (1) to procure equipment and train staff for the development of the software, hardware, voice and graphic outputs for training the visually handicapped; (2) to create and introduce skills of reading, creating and using tactile graphics in Braille practice; and (3) to pilot the use of software that supports speech-to-text-to-speech and graphics in English and Kiswahili; and pilot the use of innovations in special and integrated schools so as to inform further development. Since the Cape Town University Leaders' Forum, KU has developed strategic partnerships with MIT and CISCO Systems that will help enhance ICT innovation and delivery to the target communities.

Using ICT Innovations to Enhance the Development of Peri-urban Communities in Informal Settlements in Nairobi

Institution: Kenyatta University
Principal Investigator: Charity Wangui Gichuki, Biochemistry and Biotechnology Dept.
Proposal Summary:
Kenyatta University will develop and implement an ICT-based innovation to help alleviate poverty in low income communities in the residential/commercial centers surrounding the university. The project aims to identify the needs of the target communities in these informal settlements, generate innovative ICT solutions, implement the solutions, and carry out an impact assessment of the intervention. The specific strategies are to (1) develop a system for information gathering, processing, innovation of ICT-based solutions and dissemination of solutions to the target community; (2) establish and sustain within the university an ICT Research and Support Unit (RSU); (3) establish and sustain telecenters within target communities for commodity brokerage and information exchange with the RSU; and (4) empower in- and out-of-school youths in the informal peri-urban centers to become telecenter managers. An ongoing working relationship with Equity Bank will be developed into a strategic partnership to bring mobile and e-financial services to the target communities. Relationships with MIT and CISCO that grew out of the Leaders' Forum also would be further developed to enhance ICT innovation and delivery to the target communities.

The Selection Committees identified the following five proposals as deserving of special mention and recommended that they receive consideration by individual foundations.

Ugandan Local Language-based Computer Literacy

Institution: Makerere University, Faculty of Computing and IT (CIT)
Principal Investigator: Dr. T. Wanyama (Faculty of Computing and IT)
Proposal Summary:
The Faculty of Computing and IT (CIT) at Makerere University proposes to enhance socio-economic development of non-English speaking and semi-literate communities in Uganda by allowing them to conduct business and access computerized information in their local languages. CIT proposes to collaborate with the Institute of Languages at Makerere University to translate the OpenOffice package (Writer, Calc, Impress, Draw, Base, and Math) and Mozilla Firefox into Luganda, Runyakole/Rukiiga, and Acholi. They also plan to customize user interface content so that it is more appropriate to its Ugandan context and will thereby foster better understanding of technology. A collaborative team of local researchers, NGOs providing adult literacy programmes, and the OpenOffice online community will test product performance and assess its functionality within relevant communities. The project aims enhance computer literacy and to bridge the digital divide in order to empower individuals to contribute to their communities' livelihoods.

Digitizing Information to Enhance Teaching

Institution: University of Ghana, Legon
Principal Investigator: Professor Samuel Sefa-Dedeh, Dean, Faculty of Engineering Sciences
Proposal Summary:
The Faculty of Engineering Sciences at the University of Ghana proposes to build its departmental capacity within the University through the establishment of an information management unit equipped to provide technical support and a shared infrastructure to enhance teaching and learning activities. All five departments in the Faculty of Engineering Sciences will collaborate in this multidisciplinary initiative. The proposal outlines three objectives: (1) Create a searchable online resource for Engineering and Technology teaching in Ghana by digitizing recent research work conducted in Ghana; (2) Develop a digitized system to ensure that research conducted by faculty and final year students is disseminated to communities and industry; and (3) Promote interdisciplinary and university-private sector collaboration within information dissemination initiatives.

Feasibility and Benefits of Establishing ICT Resource Centers to Assist with Community Development in Rural Communities in the Analamanga Region

Institution: University of Antananarivo
Principal Investigators: Ying Vah Zafilahy, Director of Training and Research, Presidency of the University; and Abel Andriantsimahavandy, Director of Placement, Presidency of the University
Proposal Summary:
This proposed pilot project would develop and assess the feasibility and benefits of ICT centers and a broad range of information resources provided through the University of Antananarivo and its faculty and staff to assist in the development of rural communities. The

project would be developed jointly by a university project team and a counterpart team from the selected community. The hope is that the project would serve as a model that could be replicated broadly in rural Madagascar. The overarching objective of the project is to make a significant contribution to development through the effective use of ICT adapted to the rural areas. Among the specific goals are: opening up rural areas; reducing the ICT gap between urban and rural areas; helping to reduce the rural exodus; fostering university participation in the development of the community; and strengthening the management of knowledge between the university, the communities, and the professional world.

Induction Training for Tutors [Teachers' Colleges] on Pedagogical Aspects for ODeL Delivery

Institution: University of Dar es Salaam
Principal Investigator: Joel Samson Mtebe, Computer Science Department, Faculty of Informatics and Virtual Education
Proposal Summary:
The University of Dar es Salaam proposes to use existing ICT infrastructure in teachers colleges to train and sensitize tutors on how to develop and implement Open, Distance and e-Learning (ODeL) delivery. The objectives of the project are to introduce and train teachers in a selected Open Source Learning Management system and to offer training to tutors in pedagogical aspects of developing and delivering course content for ODeL. The project, which would be coordinated by UDSM's Centre for Virtual Learning, would focus on five teachers colleges and train a total of approximately 200 teachers, paving the way for implementation of the project at other colleges in the future. It is envisaged that some of the colleges will subsequently serve as ODeL centers hosting UDSM online programmes, including offering an online UDSM postgraduate diploma in education.

Extension of Online Laboratory Experiments at the University of Dar es Salaam as Part of ICT Curriculum Innovation and Application

Institution: University of Dar es Salaam
Principal Investigator: Aggrey Hezron Nzali, Faculty of Electrical and Computer Systems Engineering
Proposal Summary:
This project will develop new online laboratory experiments in order to (1) increase access to technical IT education, (2) improve the quality of IT engineering training, (3) increase enrolment in technical training in IT, and (4) enhance the choice and range of marketable programmes. The online labs will yield greater flexibility for students, higher equipment utilization, reduced staff workload, and reduced investment in large laboratories. The project is designed to contribute to several of the goals of UDSM's Corporate Strategic Plan: expansion and equity in enrollment and promotion of student welfare; diversification and balance between basic and demand-driven programmes; and enhancing linkages with the productive sectors and society.

Appendix A.

Partnership for Higher Education in Africa:
Grants for ICT Curriculum Innovation and Application

Members of the Selection Committee
March-April 2007

Phillip Griffiths (Chair)
Partnership for Higher Education in Africa; and
Institute for Advanced Study

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University of Botswana

Lishan Adam
Addis Ababa University

O. Akin Adubifa
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