SUB-PROGRAMME 6:
ICT/GIS for sustainable rural development

TOPIC:
IMPLEMENTATION OF HYBRID E-LEARNING MODEL FOR ADVANCED SECONDARY SCHOOL PHYSICS AND MATHEMATICS EDUCATION OF FEMALE STUDENTS IN UGANDA: ARUA CASE STUDY

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ABSTRACT
Uganda is one of the Highly Indebted Poor Countries that should achieve all the eight Millennium Development Goals (MDGs) predominantly through application of ICTs. The World Summit on the Information Society (WSIS) strongly recommends that ICTs are the only progressive tools available for acceleration of development in poor countries. MDG No. 3 deals with promotion of gender equality and empowerment of women and a specific target to be met by the UN Member states is: elimination of gender disparity in primary and secondary education preferably by 2005, and at all levels by 2015.

Gender disparity exists in the technology and engineering profession in Uganda. Makerere University, the most dominant University in Uganda, has only 18% female students' enrolment for engineering courses. Furthermore, all the female students admitted on academic merit during the 2005/6 academic year are from the urban secondary schools located in the educationally elite Districts of Kampala (the capital of Uganda) and its neighbouring Districts of Mukono, Mpigi and Wakiso. Uganda has 56 Districts, it means secondary schools in 52 Districts failed to produce a female student who performed well in Physics and Mathematics in order to qualify for admission for engineering courses in Makerere University. These Districts are rural and poor and have no facilities and resources necessary for Science and Mathematics education: there are no laboratories and libraries. In situations where these facilities are there, the poor schools cannot equip the laboratories and stock the libraries with relevant text books. They cannot attract good, motivated and committed science and Mathematics teachers.

Arua is one of the poorest Districts in Uganda. It has two government-aided advanced level girls' secondary schools. Hybrid e-learning was implemented in these schools

using participatory, multistakeholder best practice approach. The academia, donors, business community, central and local government departments and NGOs were involved. The main course delivery platform in hybrid e-learning concept is the interactive multimedia CD-ROM and the traditional face-to-face classroom sessions will continue. Students have access to Internet and can surf relevant websites for additional resources. The learning environment is managed by open source software, the Mambo, hosted on an open source web server, the cascade by B-one. The project website is http://aruaeduc.com/

Advanced level female students of Physics and Mathematics in the two schools will be exposed to the hybrid e-learning until November 2006 when they will sit for the national examinations set and centrally administered by the Uganda National Examinations Board, UNEB. UNEB is an autonomous, legal institution in the Ugandan Ministry of Education and Sports, MOES.

Hybrid e-learning is a cost effective solution for poor, rural secondary schools that cannot afford to construct physical laboratories, libraries and also, cannot attract good teachers due to low remunerations. It is also an option for private school proprietors who are reluctant to invest in science facilities. Their concerns are financial: pay back period and return on investment. Hybrid e-learning should be the government's first step towards giving mass education and open up the closed educational system that is becoming difficult to sustain due to high population birth rate 3.4%. The closed system is leading to more and more school drop out rates.

Keywords: Hybrid. E-learning. Physics. Mathematics. Female students. Gender. Uganda. Arua. Advanced Secondary School.