INTRODUCTION OF MULTIMEDIA SIMULATED SOFTWARE FOR PHYSIOLOGICAL EXPERIMENTS IN AFRICAN MEDICAL SCHOOLS

Kayode O. Adeniyi and Deborah U. Sambo

AFRET Academic Director and School of Medicine and Health Sciences, University of Papua New Guinea, and *Francis Family Clinic, Maryborough, QLD, Australia

Introduction

Computer-assisted instruction is widely applied in most medical institutions in the world because of its significant advantages over the traditional methods. This method allows students to acquire great capacity of information and learn in a more relaxed atmosphere. It also enables restructuring of experiments to the present day needs of excluding animal experimentations. There are presently over 117 faculties or colleges of medicine and health sciences in Africa. All the medical and allied health faculties operate within University systems controlled by Governments except for a few private medical universities.

Concerns for medical education in Africa

Medical education in Africa started in a milieu of traditionalism and has gone through varying phases: from training in traditional medicine in the past, to the present day modern system based on the model existing in USA and Western Europe.

During the last quarter of the last century, there have been all manner of assessments aimed at diagnosing the 'malady' of Africa's health-training institutions. Some experts have described most of sub-Saharan African Colleges of Medicine as top heavy – a euphemism, which connotes a relatively rich and manpower-endowed clinical sector that is perching precariously upon a moribund pre-clinical system.

Several of Africa's Basic Medical Science Departments have become virtually ghost houses with occasional two or three staff members sauntering through during the course of the day bearing teaching loads that would crack any normal human's back. In addition to being overworked, they are robbed of the opportunity for meaningful research to upgrade themselves and cannot even attend conferences. This brings about the lapses and deficiencies in the quality of material taught – lapses, which the student carries into the Clinical Phase with predictable detrimental effects.

The ambience of the work environments in most medical and allied health science schools in Africa today is becoming progressively less interesting. Mostly, they are ill equipped, and facilities for training are inappropriate and unsatisfactory. They have failed to keep pace with developments in technology, and faculty feel deprived and restricted, leading to dissatisfaction and frustration. Even those who have received adequate training are unable to put skills and talents to proper use because basic equipment is not available due to a mismatch between training and available technology.

The Equipment Status of Basic Medical Science Departments in African Colleges of Medicine

The African Regional Training Network for Medical and Allied Health Sciences (AFRET), conducted this equipment status survey. AFRET is a non-governmental and non-profit making organization, region resource-sharing facility founded in 1997. It seeks to strengthen health education and healthcare in Africa by improving pre-clinical medical and allied health education through sharing of good teachers and resources between schools, promoting collaborations with U.S. and European educators, identifying computer-aided instructional materials such as CD's with basic medical science curricula and setting up of centres of excellence.

The survey was conducted as follows:

a) 23 questionnaires were sent to medical and health science institutions in South Africa (SA). 20 completed questionnaires were returned. This was followed by on sight visitation to 15 of the institutions.

b) 25 questionnaires were sent to medical and health science institutions in the following countries in North Africa (NA):
   - Algeria
   - Egypt
   - Libya
   - Morocco, and
   - Tunisia.

   20 completed questionnaires were returned and it was followed by on sight visitation to institutions in Egypt and Morocco.

c) 69 questionnaires were sent to medical and allied health institutions in 36 Countries in Sub-Saharan Africa (SSA). 67 questionnaires were returned and on sight visitation was conducted to institutions in:
   - Ethiopia
   - Ghana
   - Kenya
   - Lesotho
   - Nigeria
   - Sudan
   - Togo
   - Zimbabwe, and
   - Zambia

The 107 returned questionnaires and our on sight findings were subjected to analysis to determine the availability of Teaching and Research Equipment.

The availability of equipment and communication facilities in the institutions is shown on Table 1.

Table 1: Teaching and Research Equipment

	SA	NA	SSA
E-mail and Internet Service	HD	MD	WD
Computer Aided Instructions	WD	WD	N
Computers	WD	WD	N
Audio Visual Equipment	MD	WD	N
Research Equipment	WD	MD	WD
Teaching Equipment	MD	MD	WD

HD - Highly Developed
MD - Moderately Developed
WD - Weakly Developed
N - None]

The result of the research on the inventory of teaching materials and resources conducted in the faculties and colleges of medicine shows that Institutions in Sub-Saharan Africa are poorly equipped with teaching and research materials and equipment.

The reasons for this situation are legion but our health planners and those who are directly charged with the allocation of funds for the growth and development of health personnel training institutions know them.

The recognition of the need to upgrade medical and health science education in Africa has been long recognized, largely as a result of a variety of studies carried out in the continent. Since 1992, when WHO AFRO funded a study to fully analyse the nature of the problem, however, not enough has been done to address the severe problems that have been identified. Deans of Medicine, in their own assessment of the grave problems confronting medical education had warned governments and the private sector about the needs of African medical colleges. The support has been slow in coming and at this point in time, the majority of Africa's medical colleges and schools of allied health sciences are in dire straits in terms of the required manpower to teach the basic medical sciences – the essential building blocks upon which the practice of medicine is based.

The health, economic and political stabilization in Africa would be improved if the various countries were able to produce more and better physicians. This would require the strengthening of the capacities of African Medical Scientists, which inturn could lead to the production of more and better African physicians. This could ameliorate the crisis we presently face.

Multimedia Simulated Software For Physiological Experiments

After series of workshops and seminars aimed at solving in part the above problems, AFRET has identified a 4-channel recorder including two bio-amplifiers, and one isolator monitor that could be used for an undergraduate class in human physiology and some aspects of psychology, pharmacology and medicine. This system allows most health sciences institution in Africa to customize the experiment contents to meet their curriculum requirement. The system is now widely used in Institutions in South Africa.

This system manufactured by ADInstruments comprises of a 4 channel recorder including two bio-amplifiers, and one isolated stimulator, The bio-amplifier enables ECG, EMG, EOG, or EEG recording without the need for a separate pre-amplifier, while the isolated stimulator allows nerve conduction and evoked response experiments to be carried out without an external stimulator. As a complete human physiology system, it provides you with everything you need for an undergraduate class. The system includes software, hardware, manuals and settings' files for each experiment. The system allows you to customize the experiment contents to meet the curriculum requirements.

In meeting with the AFRET's objectives, more workshops are planned to identify equipment that could be easily used in African Institutions.