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Conference Paper - April 2014

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Evidence based medicine in HIV/AIDS and Reproductive Health research: piloting two distance learning courses in low-resource settings

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Abstract: AFRICA BUILD is a Coordination Action to support the development of centers of excellence in health care, education and health research in African countries, thanks to Information Technology. This project, developed under the 7th European Framework Programme, consists of seven Work Packages (WPs). The Institute of Tropical Medicine in Antwerp is in charge of WP6 with the task of developing a specific distance training program in HIV/AIDS and Reproductive Health research in collaboration with the World Health Organization Department of Reproductive Health and Research (RHR). The aim of this program will be to enhance research and education in the above mentioned fields, via novel approaches and remote resources. Study materials will be available for students through the AFRICA BUILD Portal, and modules’ content will be delivered via live webcasts. One of the aims of the course will be to identify research gaps, focusing thereafter on strengthening research methodologies and policies.

Keywords: distance learning courses, HIV/AIDS research, Reproductive Health Research, low-resource settings.

1. Introduction

Health and health education is increasingly influenced by information and communication technology (ICT). However in low resource settings, the lack of access to current evidence and information remains one of the major barriers to evidence based medicine (EBM) practice.

Limited access to computer facilities, to literature databases and to continuing medical education programs are just some examples out of the full range of barriers causing
disparities in universal access to health care information, although one third of the world’s population is online nowadays and that over the last five years, developing countries have increased their share of the world’s total number of Internet users from 44% in 2006, to 62% in 2011 [1].

AFRICA BUILD\(^1\) (AB) is a Coordination Action under the 7th European Framework Programme (Grant Agreement no. 266474) seeking to improve the capacity for health research and education in Africa, through ICT [2]. It is aimed at providing innovative learning and research opportunities and also developing centers of excellence in health care, education and health research in African countries [Figure 1].

![AFRICA Build](image)

**Figure 1: Overall objective of AFRICA BUILD project**

In order to decrease the barrier to evidence-based medical information the Institute of Tropical Medicine (ITM) in Antwerp partner in this AB project, will work on the development, implementation and evaluation of two pilot distance learning courses in the areas of HIV/AIDS and Reproductive Health Research, in strict collaboration with WHO Department of Reproductive Health and Research (WHO/RHR), Geneva.

This pilot experience, which will be run both in English-speaking (Ghana) and French-speaking (Mali and Cameroon) partner institutions, will rely on the ability of producing targeted courses for strengthening research methodology and policy [Figure 2]. Moreover the evaluation of these two pilot courses should provide evidence supporting feasibility and sustainability of this type of distance learning courses in Africa, and inform...
any future extensions of these courses into postgraduate or PhD training programs in Africa.

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1.1 – The benefit of evidence based practice

Over the past decade there has been a growing demand for "evidence-based" medicine. Not only is there more evidence available in health care, but also more opportunities for this evidence to be used to find effective interventions, and link research questions. The practice of EBM signifies the integration of individual clinical expertise with the best available external clinical evidence from systematic research [3].

The benefits of evidence based practice are many-fold: knowledge of latest clinical evidence empowers healthcare workers to make informed decisions regarding optimal care, and empowers health facilities’ workers to demand relevant resources. In addition, the use
of evidence based medicine trains those working with(in) health facilities and systems to identify gaps in research and develop systematic strategies to address these gaps [4].

Amongst the African partners, within the AB consortium, courses already exist in the form of master programs, inter-university diplomas and short courses that cover rather exhaustively medical and public health aspects of HIV/AIDS and Reproductive Health. Strengthening of research capacity is required however to entice more young researchers to continue with a PhD program and with scientific writing.

Through these eLearning pilot courses, students will learn and apply the steps of EBM, from the definition of a specific question and the design of a search strategy to the interpretation of the evidence and the application to the practice, linking the detected gaps to possible research topics within the fields of HIV/AIDS and Reproductive Health.

EBM courses aim both at supporting the decision making of health professionals, and at empowering potential researchers to develop and propose research questions. They become familiar with all steps in this process, particularly how to carry out an efficient literature search or to appraise critically the evidence found [Figure 3].

Another crucial component of the AB project will be to create virtual communities of researchers within Africa who can continue to develop research ideas, exchange information and knowledge regarding new tools and evidence. This methodology will be introduced in the AB pilots.

**Figure 3: Example of EBM in HIV/AIDS research course**

**2. Objectives**

The specific objectives of the two pilot eLearning courses developed by ITM and WHO RHR with the African Partners are:

1. To deliver a specific training program in the field of HIV/AIDS research;
2. To deliver a specific training program in the field of reproductive health research;
3. To evaluate and analyze results of the demonstration training programs.

3. Courses development

HIV/AIDS is one of the fundamental health problems in Africa, with medical, social, political and economic implications. In this regard, AB aims to develop a new approach, based on novel IT and the use of remote resources to enhance research and education, and link these two academic aspects, with obvious clinical implications.

The e-courses developed in this project and specifically in the AB Work Package 6 will cover topics with a knowledge gap in modules, adapted specifically for the needs of the African countries. For each module, the students will study the material available on the AB portal. The modules will be introduced through a live webcast by an expert on that subject, who will highlight the issues. The specific webinars will focus on:
- How to define a research question;
- Retrieve published articles relative to the research question;
- Determine the level of evidence presented in the article;
- Evaluate articles for scientific correctness and soundness;
- Evaluate available evidence for theoretical applicability in clinical reasoning in a concrete setting.

A set of assignments per module will be given to the students. Towards the end of each module, the research needs emanating from the field will be reviewed in a webcast interactive session. The students will be encouraged to identify research topics of their own interest or needs.

This pilot course on EBM Reproductive Health will rely on the expertise of WHO-RHR to produce targeted courses for strengthening research methodologies and policies. This concrete course will be based on the WHO Reproductive Health Library (RHL), an evidence-based electronic review journal covering the field of sexual and reproductive health.

4. Technology Description

Hardware and software required to access the Africa Build portal will be:
- An Internet connection that is least 28.8 Kbps
- A monitor set to 800x600 pixels or more
- A web browser (any between: Chrome, Firefox, Internet Explorer, Opera, or Safari)
- Adobe Acrobat Reader

In order to evaluate published scientific literature in relation to a specific research question and its relevance in a concrete low resource setting context, tutorials will be webcasted using the Dudal technology, already in use by the RAFT network for continuing medical education over the Internet in French- and English-speaking Africa [5].

The tutorials will be placed on the AB portal and the topics will be discussed by the students on a Moodle discussion forum.

Moodle will be the Learning Management System (LMS) chosen to track students’ progresses and outcomes. Moreover Moodle supports SCORM (Sharable Content Object Reference Model) as standard format package for publishing contents on the web. All the LMSs that support this standard can recognize the contents and track and record every interaction between the contents and the students. Notably all material developed in SCORM can be reused in any other LMS that supports the same standard.
Learning outcomes of the acquired knowledge will be tested through mobile-based multiple choice questions (pre- and post-test) issued at the beginning and end of each module [Figure 4].

Several functions will be activated on the Moodle discussion forum which will be more appropriate for low resource settings, granting more asynchronous interactions, such as:

- an internal e-mail account which will be available for direct contact between members, facilitating the exchange of recent literature, policy documents and interaction in between sites;
- a system of alert messages which will give early notice on the personal e-mail account, when a new posting is available on the discussion forum and enables the members to interact directly on e-mail basis.

5. Results

The state of the art of the project, which started one year ago, allowed a full revision of the format, content and references for each tutorial in the Reproductive Health course and the allocation of subject-matter experts for the HIV/AIDS research courses.

A specific focus, due to the limited lifespan of the project which is 36 months, will be to assess the immediate or direct effects of the program, such as:

(i) how much the program was used; how many people were reached and graduated; the extent to which program objectives were met; and changes in skills, knowledge, or attitudes;

(ii) the graduation rates and learner achievement (course grades or standardized test scores);
(iii) the overall effectiveness of distance education programs (e.g. student satisfaction ratings, completion rates, and staff turnover).

The analysis of these two pilots, which are offered for free to selected enrolled students, could provide the basis for extending new courses at the different postgraduate and PhD programmes that are currently offered or planned by the African partners.

6. Conclusions

In order to provide concrete evidence of the feasibility and operability of eLearning courses on EBM in the African context, the Work Package 6 of this 7th European Framework Programme project will focus on the development, implementation and evaluation of two pilot courses in the areas of HIV/AIDS research and Reproductive Health research.

Through the courses described above the students will learn and apply the steps of EBM, from the definition of a specific question and the design of a search strategy to the interpretation of the evidence and the application of the latter to practice, linking the detected gaps to possible research topics within the fields of HIV/AIDS and Reproductive Health. Moreover the students will be linked in virtual communities of researchers who can continue to develop research ideas, exchange information and knowledge regarding new tools and evidence.

Acknowledgements

This work has been partially funded by the European Commission through the AFRICA BUILD Coordination Action under the 7th Framework Programme (Grant Agreement no. 266474).

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