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A Culturally-Sensitive Model for CME Distance Learning Demonstratesa Way Forward: Kenya's Experience with ACME-IT (Advancing Continuing Medical Education Through Information Technology)

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Abstract: A distance learning Continuing Medical Education (CME) project based on live interactive presentations and a group participatory model demonstrated that important strides can be made in the quality of CME available to health care professionals in African rural settings. Implementers choose a communication model consistent with the fundamental orality of Kenyan and other sub-Saharan African countries. The project involved four hospitals and one training institution in rural Kenya. The testing of learners and focus group discussions with learners, facilitators and presenters indicated that the project's methodologies, that strove to be culturally and work place friendly, contributed to gains in knowledge, competencies including case management, the continuity of patient care, team work, staff morale and other issues of expressed importance to the hospital healthcare work force and hospital administrators. The learning system, known as Advancing Continuing Medical Education through Information Technology (ACME-IT), was implemented by the Kenyan Ministry of Medical Services, EC Associates and the US-funded Aphia2 Western initiative implemented by PATH. The findings of this pilot suggests that the ACME-IT methodology that set up learning centers at the participating institutions is a promising viable alternative to the traditional and relatively expensive workshop training that characterizes much of CME in lower and middle income countries.

Key words: Continuing Medical Education, Distance Learning, Kenya, Africa, Information Communication Technology, telemedicine.

1. Introduction

A pioneering project to provide health care professionals in Western Province, Kenya with in-service synchronous and interactive group distance learning has demonstrated that Information Communication Technology (ICT) is capable of delivering world class health education/training seamlessly and reliably to practitioners in the remotest village to cosmopolitan capital cities wherever they be located. It is widely acknowledged that demand for

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health services in Africa exceeds the training capacity and that investment in human resource development places a greater emphasize on initial training over continued professional development. A 2009 article in the *Online Journal of Satellite Communication* [1] challenged the global public health community to deploy ICT in middle and lower income countries as a way to leap frog CME into the digital age as part of an effort to bring best healthcare services and practices to the entire world's people [2].

The literature on CME in lower and middle income countries and the relative merits of various methodologies is very anemic; the authors' research has found no mention of cultural sensitivity in the literature on the design of e-learning initiatives, nor is there a literature on the merits of the ubiquitous face-to-face workshops that characterize most of the CME learning interventions in sub-Saharan Africa. Authors of a 2013 literature review of in–service training design concluded that "future educational research agenda must include well-constructed evaluations of effective, cost-effective and culturally (our emphasis) appropriate combinations of technique, setting, frequency and media, developed for and tested among all levels of health workers in low-and middle-income countries [3].

This lacuna is surprising due to the identified great need for capacity development in all aspects of e-health in sub-Saharan Africa as well as urgency to explore innovative solutions in advancing the quality of health delivery in sub-Saharan Africa. According to South African and Canadian researchers, "developing countries are in danger of being led, unwittingly, into adopting so-called international best practices, which may well be inappropriate for the developing world" [4].

To overcome the current dearth of research data in the public health arena as to culturally-appropriate and effective forms of CME learning, the designers of ACME-IT were guided by the insights into African modes of communication put forth by Kenyan communication theoretician, Malaika Mutere, who advised the project in its conceptual stage. Dr. Mutere has argued convincingly for the centrality of orality in African modes of communication and for the role of interactivity and community that lay at the core of oral expression [5]. The project also drew upon understandings put forth by ACME-IT project director, Gregory Alonso Pirio. Using findings from the broadcast arena, including from a HIV/AIDS journalism intervention in Mozambique, Dr. Pirio has argued for the necessity of both adopting community participatory and socially interactive formats and of avoiding individualistic broadcast models derived from Western journalistic paradigms, if the media is to fulfill its potential role in behavior change health communication in Africa [6, 7].

Other studies, though not specifically dealing with CME, seemed to confirm the importance of a culturally-sensitive approach to learning. Studies in the United States of learning patterns of the African-American community, which retains a strong culture of orality from its African heritage, indicate the expressive performance style of African-American communication "incorporating orality and group cohesiveness takes its toll when the interaction with audience is distanced and the call-and-response nature of the African American discourse style is impeded" [8]. Project designers concluded that effective distance learning could be built on the culturally-determined predilection for social interaction that reflected Kenya's legacy of oral tradition [9]. Though not available at the time of the ACME-IT experiment, the 2013 literature review of in-service training design and delivery mentioned above that focused largely on training in advanced economies also suggests the use of multiple techniques that allow for interaction and enable learners to process and apply information [10]. As a result, the ACME-IT design steered clear of, for instance, an individualized, self-paced approach.

The project also sought to insure that the ACME-IT intervention was workplace friendly. So, it engaged in

a process of bottom-up consultations at each of the four participating hospitals to find out the concerns of the potential learners and hospital administrators as well as those of district and provincial health officials. The idea of creating learning centers at each hospital emerged from these consultations and offered the possibility of integrating the learning experience seamlessly into the routine work flow.

An understanding of the cultural and workplace context of learners informed the choice of a technology that permitted live group learning. First, ACME-IT sought to reinforce the Ministry of Medical Service's (MMS) policy that mandated weekly *in-situ* CME session at its hospitals. At the four hospitals participating in the ACME-IT initiative, the "standard" CME sessions consisted largely of hospital staff sharing their knowledge and experience with each other. For instance, if a staff member attended an off-site training workshop on a particular topic, the staff member may then share insights from the workshop with colleagues and engage colleagues in a group discussion. Accordingly, the hospitals incorporated the ACME-IT sessions as part of their regular CME program with hospital CME coordinators integrating ACME-IT as part of the official CME program. The existing CME culture of group discussions seemed to confirm ACME-IT's group approach to learning.

2. Materials and Methods

PATH through its USAID-sponsored APHIA 2 Western project, EC Associates, Kenya's Division of Leprosy, Tuberculosis and Lung Disease (DLTLD), and four public hospitals in Western Province, Kenya, jointly organized a pilot demonstration project designed to bring synchronous, interactive group distance learning to four learning centers in Western Province, Kenya.

The learning centers were set up in the following institutions as recommended by the Provincial Office of Medical Services:

Busia District Hospital, Lugari District Hospital, Mbale Provincial Rural Training Center/Vihiga District Hospital (joint learning center) and Western Provincial General Hospital located in Kakamega.

The DLTLD and National AIDS/STD Control Programme (NASCOP) provided the presenters and curriculum, which consisted of eleven PowerPoint presentations that were narrow casted via broadband internet from PATH offices in Nairobi. The curriculum focused on issues relating to TB/HIV/AIDS, Multiple Drug Resistant TB (MDR-TB) and Infection Control. DLTLD defined its learning audiences as nurses and clinical officers staffing the participating hospitals.

The already-established CME coordinators at each hospital extended invitation and reminders to hospital staff to participate. The CME coordinators also operated the equipment installed in the learning centers and engaged in technical troubleshooting when necessary.

At the learning centers located in the hospitals, participants—approximately 120 in total—were able to see and hear the presenters, view a PowerPoint slide show, and interact with the presenters through texting or live Q&A among the presenters and the participants at each of the learning centers. Immediately following the live presentations, District TB and Leprosy Coordinators (DTLCs) led facilitated discussions among the learners at each center.

EC Associates, a sub-contractor to PATH:

- provided overall supervision of the project;
- tested various IT architectural options for the project;
- selected and contracted a Satellite Internet service to deliver the interactive sessions via a software presentation collaborative cloud;
- trained CME coordinators and other learning center staff in the use of the IT equipment;
- provided IT specialists who supported the DLTLD lecturers in delivering their PowerPoint presentation;
- conducted monitoring and evaluation of the project.

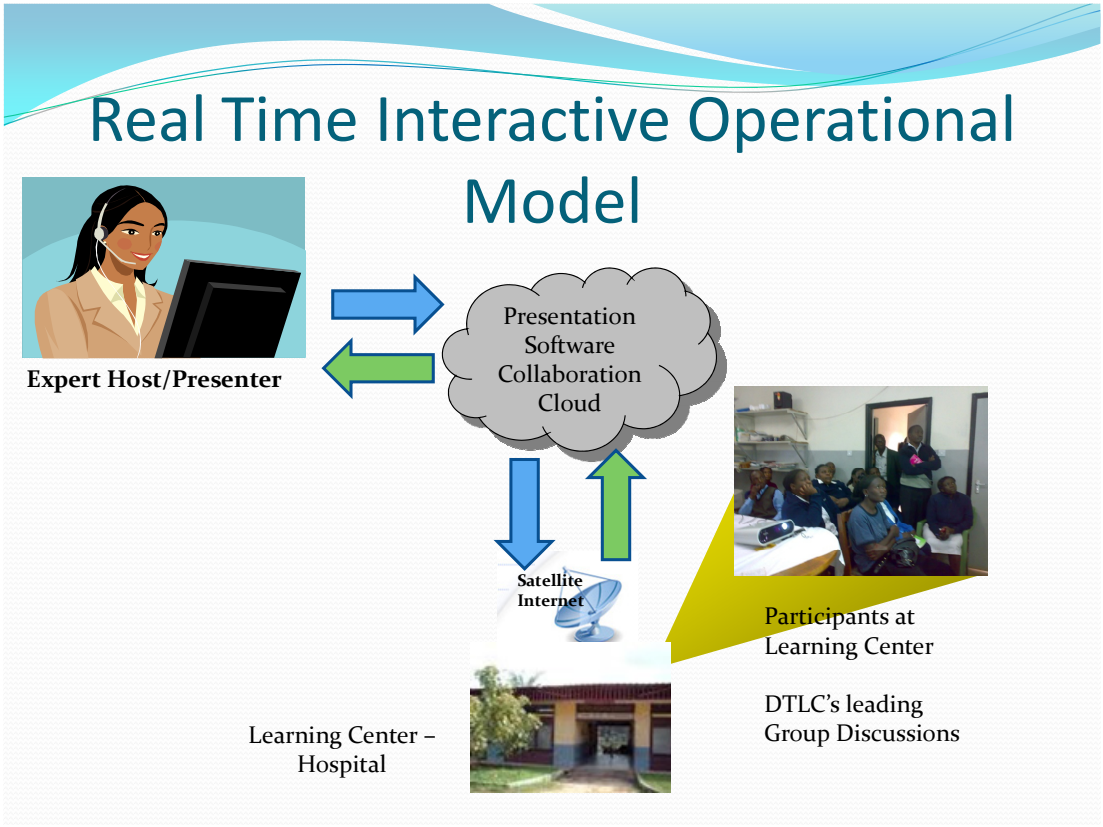
PATH:

- provided technical support in collaboration with the DLTLD technical team to design training materials and coordination of strategic meetings with key Ministry of health policy personnel;
- supervised the installation of small satellite dishes at the four learning centers;
- assisted EC Associates in coordinating the learning and testing activities in Western Province;
- provided the conference room with broadband Internet connection in Nairobi, from whence DLTLD delivered the presentations.

District TB and Leprosy Coordinators (DTLCs) were lynchpins of the ACME-IT pilot in helping to providing essential administrative coordination at each of the learning centers and in furthering the learning experience. They played key roles in:

- helping to recruit hospital staff to participating in the eleven-session course;
- registering the participants;
- administering and grading the pre and post-tests for each session as well as the cumulative test at the end of the course;
- maintaining attendance and test score records;
- leading the facilitated discussions at each of the learning sessions.

Operational Model Graphic



Each ACME-IT learning session consisted of the following segments

Segment	Duration
Emcee: Introduction, ground rules, housekeeping	5 min
Slide show presentation with questions to presenter *via* chat mode	45 min
Live audio Q & A with presenter	20 min
Facilitated Discussion at each site conducted by District TB and Leprosy Coordinators	20 min
Total	90 min

Topics of the presentations included: Introduction to TB HIV, Diagnostics and Surveillance, TB-HIV, Multiple Drug Resistant TB, Pharmaceuticals and Drugs including laboratory logistics management information system best practices, the role of Nutrition in TB HIV management, TB Infection Control, Importance of Community TB Care, Stigmatization, Advocacy Mobilization, and Routine surveillance M&E.

3. Results and Analysis

3.1 Evaluation: Pre and Post-tests

Each presenter designed a test to assess core knowledge and competency of the learners. These tests were administered to learners before and after each session. Scoring of these tests demonstrated a consistent gain of around 20% in knowledge and competencies.

3.2 Evaluation: Participants' Focus Group Discussions—Analysis

The project conducted a Focus Group Discussion (FGD) at each of the four facility-based learning centers in Western Province. Participants, facility administrators and CME coordinators took part in the discussions. The FGD facilitator conducted each FGD by posing a standard set of questions that guided the discussion, and the discussion group members had free reign to respond and carry the discussion into whatever areas that they wanted. The session were recorded and transcribed for analysis.

With little exception, the patterns of observations made at all four learning centers were strikingly similar. Overall, the FDG discussions revealed a high-level of satisfaction with the ACME-IT learning experience. When CME coordinators and facility administrators were asked to rate the learning experience on a scale of 0 to 10, with "5" being "moderately valuable" and "10" being "extremely valuable", the lowest rating given the experience was "8", with 70% of the respondents rating the experience at "9" or above.

All the facility administrators who regularly attended the distance learning session expected that TB prevention, diagnosis and treatment would be improved as a result of the intervention. For instance, one hospital administrator noted that he expected to see an "increase in [TB] case findings; increase in the number of suspects by the lab; and, of course, the infection control measures will be put into place".

3.3. Advantages

Focus group session participants described a number of advantages to the ACME-IT approach.

3.3.1. Vertical Learning: Learning from the Experts

Participants expressed the opinion that ACME-IT was an improvement over the standard CME being delivered weekly at the hospitals because they were learning from experts in the field. Each facility has an on-going CME initiative, which consists largely of facility staff sharing their knowledge and experience. One participant at Lugari District Hospital said that ACME-IT was "an improvement on standard CME as we are learning from people who are more knowledgeable than us. We are actually learning more than we know". Another participant said, "It is possible to get direct answers to our questions directly from the experts in Nairobi, and that has been very interesting."

3.3.2. Updating and Refreshing Knowledge

Several FGD participants welcomed the fact that "We get the latest updates more quickly," and there was also a widespread acknowledgment that their knowledge was being refreshed. "Good refresher; you forget things; and this reminds you…"

3.3.3. "Horizontal Learning": Learning from Colleagues at Other Hospitals

Several participants said that they were able to learn not only from the lecturer making the slide show presentation, but also from their colleagues whom they heard asking questions from other learning centers in Western Province. "We are learning the challenges that other facilities face and ways to solve similar and even different problems." In effect, comments applauded the

fact that they were learning how knowledge had evolved in competencies at other hospitals, as staff applied knowledge to practical situations.

3.3.4. Telemedicine Benefit

Participants also described how they were able to ask experts for advice on how to deal with current cases they were dealing with. "It has been possible to ask questions about what a patient in the TB ward actually needs, and we have been able to help him/her." (Such observations suggest that the quality of clinical care at remote and rural facilities may be enhanced through the introduction of telemedicine consultations.)

3.3.5. Improved Continuity of Care

Different participants mentioned that in-station training meant there was less disruption in the care that they gave to patients. "Since we don't have to travel to a centralized place for training, we are able to give better continuity of care to our patients."

3.3.6. Cost Effectiveness

"It is cost effective because we don't have to spend money on travel [to workshops]. Yet, we get the same information."

3.3.7. Staff Morale and Teamwork

There were statements made at each of the learning centers that the group-learning experience contributed to a heightened commitment among participants to greater teamwork and a boost in staff morale. "This has been a wonderful activity because we are really bonding learning here together. There is team work and everybody I can see is happy with it." One participant acknowledged that he would cooperate more with the hospital administration to achieve improved TB infection control in the facility, as a result of what he had learned.

3.3.8. Many Benefit from the Training

Participants said that they welcomed the group training because a number of people at the station benefited from the learning, instead of just the one individual who might go off to workshop training to represent the facility. "Receiving it on site makes it accessible to all health workers. For instance, I'm a medical engineering technician, and I am enjoying this information with other (divisions), especially the clinicians and nursing departments."

3.3.9. Convenience and Time Effectiveness

Participants also observed that the in-station training is convenient because it is situated at the facility where we work and that it is "time effective". "This allows us to leave work for some few minutes and get some updates to our knowledge." "You are actually able to get everything at your comfort".

Some female learners said they appreciated the fact that they did not have to travel for training, for travel disrupted their home lives, especially because of their responsibilities for taking care of their children.

3.3.10. Improved Patient Care

"We know better what a patient may have as a result of this teaching".

3.4 Evaluation: Presenters Perspectives

As part of its evaluation, EC Associates administered a written questionnaire to survey the quality of the experience for the lecturers who had made the presentations. As has been noted, DLTLD mobilized public health experts within the DLTLD and NASCOP to deliver eleven PowerPoint presentations on TB/HIV topics. The eleven presenters were leading in-country experts on TB/HIV issues facing Kenya.

3.4.1. Advantages

Most presenters agreed that ACME-IT possessed the advantage of reaching a relatively large number of health care professionals at a time, as one presenter wrote, "A great opportunity to pass knowledge to many health care workers in rural setting at one go." Some presenters noted that the ACME-IT approach would cut down on the travel and other time spent to reach smaller number of health care professional. One presenter welcomed the opportunity to reach health care workers from the comfort of an office in Nairobi and reduced time spent on travel, freeing this time for other activities.

3.4.2. More Interaction with the Learners

When asked what they might describe as disadvantages of this learning approach, several presenters said that they would like to be able to see the learners and receive more questions from them. Several presenters also felt inhibited to engage more freely the learners with questions—a type of interactive teaching.

Some of the presenters missed tuning into immediate body language and facial feedback from the learners, wondering if learners were understanding the presentations or if learners might be "dozing".

Ironically, the learners in the Focus Group Discussions had a different perspective as they expressed their appreciation for getting the latest from the "experts in Nairobi"; nor were the presenters' privy to the lively and informative facilitated discussions that were part of the learning experience at remote sites. These discussions were taking place at each learning center after the DLTLD presentations had finished and were facilitated by District TB and Leprosy Coordinators. The facilitated discussions often focused on how to apply the knowledge learned to real conditions in the hospital, so they gave a very practical dimension to the learning experience and reportedly led to competence gains. In addition, as noted previously, the learners also gain considerably from input from learners at the other hospital learning centers; this was an unexpected horizontal dimension to the learning experience.

3.5 Evaluation: Focus Group Discussion with District TB and Leprosy Coordinators

Because of the key roles that they played in implementing the pilot, the District TB and Leprosy Coordinators (DTLCs) were able to provide valuable insight into a variety of issues at the level of the hospitals and learning center. In terms of learning outcomes, the DTLCs believed that the learners' gains in knowledge and competencies were significant, as evidence by the pre and post test and by DTLC observation.

From direct evaluative observation of some of the facilitated discussions taking place during each learning session, it was clear that the DTLCs played an important role in leading discussions on how to apply the knowledge presented in the PowerPoint lectures to real workplace situations. In a sense, the DTLCs were taking the information presented and further translating it into competence outcomes through interactive group sessions. (The competence gain was also apparently reinforced during the "horizontal" learning taking place among the health facilities as previously described and during the interactivity with the lecturers.)

In the FGDs, the DTLCs acknowledged that they regarded the application within the workplace of the information presented by the expert presenters as an important part of the function that they played. Central to the DTLC effort was the reinforcement of case management guidelines and instilling the knowledge of these guidelines and motivating their application by the health care providers. In observed facilitated discussion, the DTLCs displayed a profound understanding of the practicalities of the work setting, and via a Socratic-like method of probing the learners with questions motivated the learners to express how to apply the knowledge gained to their work.

The DTLC also recognized that at times the presented curriculum could have been more tailored to the situation of the clinicians, for example, by presenting less information on public health statistics. In any event, the DTLC appeared skillful in overcoming this perceived shortcoming during the facilitated discussions.

By administering and grading the course tests, the DTLCs said that they were able to recognize patterns of knowledge gaps and determine areas in which the learners were having some difficulty in learning, thus establishing a feedback mechanism to the lecturers on setting priorities for learning.

The DTLCs acknowledged that the learners were getting the latest updates on policy and treatment much

more quickly than in the past. This meant that the DTLCs were themselves not yet aware of some of the "latest" information, and as such they felt that this limited their ability to follow up on this material during the facilitated discussions. They suggested that prior to a new course that they meet in a group to review the PowerPoint presentation so that they could familiarize themselves with the updates as a way of making them more effective facilitators for the learners.

4. Concluding Discussion

ACME-IT applied an interactive group learning model because it was considered to be both culturally compelling and workplace friendly. Findings from the evaluation of ACME-IT's impact validated this premise, showing:

- significant gains in healthcare worker morale and greater bonding among teams of health workers;
- the creation of opportunities for both horizontal learning, that is, the sharing of knowledge among professionals and the transformation of information received into competencies;
- increased knowledge base of hospital health workers;
- testimonials as to improved competency.

Because the learning took place in centers established within each hospital, participants considered the learning environment to be worker-friendly and contributed to the continuity of patient care by reducing health worker absenteeism often caused by off-site training. Learners testified that the improved in-station CME led to enhanced treatment and care and were responsible for other advances that are outlined in this article. The live presentations by public health experts located in the country's capital, Nairobi, reportedly led to an acceleration of the dissemination of new healthcare policy and information to health care practitioners and public health workers.

The ACME-IT experience also showed that technological and human resource barriers to the delivery of quality distance learning via ICT, such as the reliability of electric supply and Internet access as well as the level of IT skills at rural hospitals, were surmountable.

The performance of health care systems is closely related to the numbers, distribution, knowledge, skills and motivation of its workforce, particularly of those individuals delivering the services. Improvements in global health are greatly dependent on how well health systems can meet the demands placed on them by governments, programs, communities and ultimately individuals. All categories of clinical and non-clinical staff constitute a *sine qua non* of health systems. Therefore, the development of effective continuing education is crucial step towards achieving and sustaining improved and equitable health.

Given the successes of the proof of concept of the ACME-IT model, the emerging CME challenges now center on transitioning away from the costly workshop method of off-site CME traditionally utilized in low and middle income countries toward an ACME-IT-type model. This will require sufficient buy-in from an array of stakeholders including Ministries of Health, international health agencies, health NGOs, donors and other allies. Committed leadership will be required to allow stakeholders to leave the comfort zone of the conventional workshops method to embrace a systemic innovation. ACME-IT model offers the prospect of a new vision for such a transition. The authors offer recommendations at the end of this article.

5. Concluding Recommendations

Those national and international public health agencies reconsider the wisdom and practice of relying on workshop training as a means of CME, and, adopt ACME-IT model as a less expensive and likely more effective learning method. At the least, national and international public health agencies should establish standards for measuring the positive and negative outcomes of the traditional workshop training to

determine whether the substantial resources expended in this type of traditional CME methodology warrants continuation.

That Kenya's Ministry of Health considers scaling up the use of ACME-IT as a means of creating a Kenyan-owned ACME-IT system capable of strengthening its laudable CME activities mandated with its public hospitals. This will require the setting up of ACME-IT learning centers in all public hospitals.

Those donors utilize ACME-IT, when adopted by the Ministry of Health, to conduct their training of health care workers, and in the process re-budget funds from workshop training into ACME-IT.

That in its next phase, ACME-IT explore how best to attract community health workers and health professionals working in clinics into the learning centers established at hospitals as a means of further outreach and inclusion in a strengthened CME effort.

References

[1] Haridasan, K., Rangajaran, S., and Pirio, G. A. 2001. "Re-inventing health care training in the developing world: The case for satellite applications in rural environments." *Journal of Space Communications* (14). http://satjournal.tcom.ohiou.edu/issue14/health_training.html.

[2] Hongoro, C, and McPake, B. 2004. "How to bridge the gap in human resources for health." *Lancet* 264: 1451-1456.

[3] Bluestone, J., Fullerton, J., Carr, J. C., Aldermanj, J., Bon Tempo, J., and Johnson, P. 2013. "Effective in-service training design and delivery: Evidence from an integrative literature review." *Human Resources for Health* 11 (51). http://www.human-resources-health.com/content/11/1/51.

[4] Mars, M., and Schott, R. E. 2010. "Global e-health policy: A work in progress." *Health Affairs* 29 (2): 237-243. http://content.healthaffairs.org/content/29/2/237.abstract.

[5] Mutere, M. 2012. "Towards an Africa-centered and pan-African theory of communication: Ubuntu and the oral-aesthetic perspective." *South African Journal for Communication Theory and Research* 28 (2): 147-163.

[6] Pirio, G. A. 2012. "HIV and Journalism: Lessons from the Frontline of Behavior Change Communication in Mozambique." In *The Global Handbook of Health Communication*, edited by Waisbord, S., Obregon, R., and Hoboken. N. J.: John Wiley and Sons.

[7] Airhihenbuwa, C. O., and Obregon, R. 2000. "A critical assessment of theories/modes used in communication for HIV/AIDS." *Journal of Health Communication*. 5 (15): 5-15.

[8] Anokye, A. D. 1997. "A case for 'orality' in the classroom." *Clearing House* 70 (5): 229-231.

[9] Ryckeghem, D. V. 1995. "Information technology in Kenya: A dynamic approach." *Telematics and informatics* 12 (1): 57-65.

[10] Bluestone, J., Fullerton, J., Carr, J. C., Aldermanj, J., BonTempo, J., and Johnson, P. 2003. "Effective in-service training design and delivery: Evidence from an integrative literature review." *Human Resources for Health* 11 (51) http://www.human-resources-health.com/content/11/1/51.