

health information on the Internet. This will help in supporting their health sciences education projects and activities. Evidence shows that in Tanzania there is a mismatch between health sciences students enrolled in various health courses and available Health Learning Materials (HLM). Alternatively, available health information on the Internet will address the current challenges encountered by health sciences students. However, accessing the increasing number of health information on the Internet sources requires a certain level of competency and training.

Methods: This study is going to use Design-Based Research (DBR) methodology, whereby the designed interventions will be implemented in three iterative cycles. Both qualitative and quantitative data will be collected at each implementation cycle. Descriptive and inferential analysis will be used in quantitative data while content analysis will be employed in qualitative data. Targeted participants will be drawn from the following: 3 health educators, 1 librarian, 1 ICT officer and 15 health sciences students, all from health training institutions in Tanzania. Researchers will train health educators, the librarian and the ICT officer using the designed interventions on how to conduct basic and advanced searches on the Internet. Later on, they will train students on how to locate online health resources.

Based on the Big6 model, which this study is going to employ, the six processes of IPS which will be taught to participants during the first iteration of the designed interventions are task definition, health information seeking strategies, location and access to health information, use of health information, synthesis and evaluation. Evidence shows that the IPS model is very effective and useful in teaching and learning health information skills in health settings. Studies suggest for an effective outcome of the information skills program, designers and researchers should employ the IPS model. Consequently, participants will be competent in the previously mentioned six processes of locating health information in an electronic environment.

Going Forward: Evidence-Based Medicine Practice is relevant to the developing countries as well as 21st century students. Through the IPS model, students will be able to learn both health information and technology skills. The first iteration is expected to be implemented in early 2016, the obtained results will be used for refinement of the intervention for the next iterations. On the overall, it is anticipated that the designed electronic instructional interventions will be incorporated and integrated into the health sciences curricula in all health science programs in Tanzania.

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Abstract #: 2.007_TEC

Problem solving and learning from clinical cases in rural India using global network of volunteer physician experts

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Program Purpose: There is severe shortage of physicians in rural India, especially specialists and this limits the scope of patient care

and professional growth of physicians and trainees. Jan Swasthya Sahyog (JSS) is a healthcare organization in rural India that provides comprehensive healthcare to rural and tribal population and trains Family Medicine residents. Physicians around the world are motivated by mastery and purpose in their work and are willing to provide assistance to JSS via tele-consultations. We setup a workflow for remote physician experts to provide real-time assistance in clinical management of complex cases in a limited resource rural hospital setting using email for tele-consultation.

Methods: Treating physician sends a case summary along with the objective data and images via email to physicians in USA and India who engage their professional network to answer the clinical question(s) and report back to the entire group. The referring physician eventually reports the case's outcome. All learn from this information exchange.

Outcomes: Since January 2013, this model of tele-consultation has connected experts in USA and India for clinical problem solving of >150 consultations. The expert input has informed interpretation of key investigations such as radiographs, ECG, echo and guided further investigations to arrive at accurate diagnosis. It has also influenced therapeutic decisions taken for patient care. Expert physicians have continued to participate in this activity without financial remuneration.

Going Forward: Next step is formal evaluation of participant feedback and impact on patient care. We are also looking for more efficient technology platform for collaborative problem solving for clinical cases.

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Research project on technology in global health: Finding a means to combat child malnutrition in the developing world

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Purpose: Technology has the potential to become an essential tool in health education across the developing world. Strategies to improve the nutritional health of children involve spreading awareness on both proper diet and growth standards to support and monitor children. A majority of the world's population (including those in rural areas) is currently covered under mobile networks, and the number of mobile technology users has grown beyond the number of those who do not. This opens the path for different modes of technology to reinforce outreach throughout the most inaccessible areas that receive limited medical attention. This research project focuses on case studies of existent technological platforms in order to propose a successful program as the next step forward.

Design: Various technological platforms were evaluated based on the following research questions:

- 1) What form of technology is most practical to employ in the context of a developing country?
- 2) How can the variables of availability, accessibility, and adaptability be measured and compared between different technological tools?

3) What successful characteristics ensure sustainability of a program?

The evaluated existing programs ranged in varying forms of technology: radio and print, visual media, and mobile systems.

Evaluation: A project based on visual media and supported by printed resources demonstrates the greatest feasibility to spread education on child nutrition in developing countries. Visual media and printed materials can be distributed most efficiently based on resource availability and flexibility in content translation for various languages and cultures. Mobile-based education may prove more difficult to establish due to increased time and resources needed to integrate a complex system, nonetheless it has the most capacity for large-scale efforts. Mobile technology has great potential to bridge the gap in remote health services, and visual media can be an appropriate and attainable first step moving forward.

Going Forward: In order to truly evaluate and create a successful program, a pilot study to assess the strengths and weaknesses of a small-scale technological intervention in a resource-limited area would be essential. Ultimately, a further developed project could stand as a fundamental model to be replicated in developing regions around the world.

Abstract #: 2.009_TEC

The role of integration in achieving an AIDS-free generation: Best practices from a comprehensive review of the peer-reviewed and gray literature

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Background: The global health community has recently turned its attention toward integration of health programs as an innovation to optimize resources and achieve greater impact. However, knowledge of the impact of and best practices for such integrated programming is limited. To fill these gaps, we conducted a scan of the peer-reviewed and gray literature of programs integrating HIV services with family planning (FP), maternal and child health (MCH), malaria, nutrition, tuberculosis (TB), and/or water, sanitation, and hygiene services.

Methods: We searched three databases for evaluations of HIV-integrated programs in lower- and middle-income countries published since 2010: (1) PubMed for systematic reviews and meta-analyses, (2) USAID Development Experience Clearinghouse for project evaluations, and (3) Google Scholar for highly cited articles.

Findings: We reviewed 291 peer-reviewed articles and 68 program evaluations. From the peer-reviewed literature, we identified several approaches with demonstrated impact on HIV and other health outcomes, including: opt-out, provider-initiated testing and counseling (PITC) for HIV within FP and MCH services; administration of malaria prophylactic treatment in co-endemic areas and prioritization of pregnant women; integration of ART directly into antenatal clinics; vitamin A or beta-carotene supplementation for pregnant women and children with HIV; PITC, care, and preventive therapy for TB within HIV settings as well as PITC of

HIV at TB clinics; and supporting exclusive breastfeeding. The program evaluations, while lacking implementation details, revealed several lessons and recurring themes including: the need for long-term funding cycles and a focus on health systems strengthening to guarantee successful integration results; the importance of investing in robust study designs and M&E systems to attribute effects; and the use of wrap-around services to enhance retention in care. Commonly used integrated approaches included services coordination at the facility level, community mobilization, behavior change communication, social marketing, public-private partnerships, and male involvement.

Interpretation: It is time to integrate services intelligently by taking evidence-based interventions with demonstrated impact on HIV and other health services to scale; failure to do so denies the synergies of integrated programming. Donors and programs should invest in impact evaluations and documentation of implementation details to facilitate replication and adaptation of innovative integrated approaches.

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Innovating health systems monitoring and evaluation in low- and middle-income countries: Lessons for knowledge translation

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Background: To achieve sustainable and resilient health systems, examining existing health systems performance built upon the best available evidence and a strong information system is vital. However, many low- and middle-income countries still lack the needed capacity to develop a responsive and robust monitoring and evaluation mechanism. To address this, this study investigates on available assessment technologies and innovations, data visualization tools, and other monitoring and evaluation mechanisms that countries can use despite limited resources. This study provides baseline information on these assessment and visualization technologies and innovations that are targeted for LMICs.

Methods: Online databases from 2000 to present were searched systematically for innovative monitoring and evaluation mechanisms. Published studies, reports, including grey literature relevant on the topic were identified through a systematic search using the following strategies: first, to identify peer-reviewed publications, online databases such as PubMed, EMBASE, PsycInfo and the WHO GIFT and IRIS tools were searched, including their reference lists using designated MeSH terms. Second, select government and non-government organizations and research institutions were contacted to collect further information. For each technology and innovation applied for monitoring and evaluation and knowledge translation, we parsed the assessment and visualization tools to identify similarities between them, which we catalogued into a framework comprising the assessment domains and visualization requirements.