Smartphone-Based Mobile Learning with Physician Trainees in Botswana

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ABSTRACT

In recent years, mobile learning in medicine has been utilized to increase healthcare providers’ access to health information. This has improved healthcare providers’ ability to make appropriate clinical decisions at point-of-care, particularly in resource-limited settings. Mobile phones facilitate information and communication technology support for patient care and collaboration amongst providers. In this paper, the authors describe a smartphone-based mobile learning initiative with physician trainees at the University of Botswana School of Medicine, focusing on the authors’ experiences with recent scale-up efforts to remote areas of Botswana. The authors also explore the potential impact of mobile learning in developing health capacity.

Keywords: Development, Healthcare, ICT, Information, Medical Education, Medical Students, Mhealth, Mlearning, Mobile, Physicians, Resource-Limited

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INTRODUCTION

In medicine, mobile learning (mLearning) has developed as a tool that utilizes mobile technology to increase healthcare providers’ access to medical information and resources, particularly in resource-limited settings (Kwankam, 2004; Lester & Karanja, 2008; Prgomet, Georgiou, & Westbrook, 2009; Zolfo et al., 2010). Paralleling the growth of mobile health (mHealth), this emerging field has been termed mobile health for education (mHealthEd) by some (http://www.mhealthed.org). Across Africa, the information needs of healthcare providers are not being met (Pakenham-Walsh & Bukachi, 2009). This has been associated with suboptimal delivery of healthcare to a substantial portion of the world’s population (Pakenham-Walsh & Bukachi, 2009). Access to information and resources is integral to the delivery of healthcare. By circumventing issues associated with outdated and virus-laden computer resources and limited Internet bandwidth, mobile devices and networks allow resource-limited countries to implement information and communications technology (ICT) systems for improved access to health information (Alexander, Igumbor, & Sanders, 2009; Beveridge, Howard, Burton, & Holder, 2003; Hadley & Mars, 2008; Kwankam, 2004).

There have been numerous projects exploring the use of mobile technologies to facilitate learning throughout Africa. These projects have occurred in multiple sectors of society, including education, health, and social support programs. Short service message (SMS) based mobile technology has been used to support distance education learners in South Africa (Viljoen, Du Preez, & Cook, 2005) and to distribute information en masse to learners in South Africa (Brown, 2003) and Kenya (Traxler & Dearden, 2005). It has also been used to provide counseling for people with drug dependency (Parker, Wills, & Wills, 2010). In medicine, mLearning facilitates situated learning, which is learning that is embedded within an activity and where knowledge is presented in an appropriate context (Lave & Wenger, 1990). When evaluating a patient at the bedside, mLearning can provide just-in-time access to support the immediate learning priorities (Traxler, 2007), which is clinical decision making in this context.

Decision support is an important aspect of mLearning that is facilitated by personal digital assistants (PDAs) and smartphones. In one study assessing the feasibility of PDAs for rapid retrieval of information, emergency department physicians at an academic medical center accessed PDAs on 61.4% of patients versus 44.5% with texts (odds ratio [OR] 1.99, confidence interval [CI] 1.4-2.80). PDA access was 75% and 25% for drug-related information and clinical information, respectively. Using electronic resources, changes related to patient management occurred in 29.8% of patients, compared to 17.6% when using print resources (OR 2.00; CI 1.11-3.60) (Rudkin, Langdorf, Macias, Oman, & Kazzi, 2006).

PDA use in medical education has been documented in a number of reports. A systematic review included 67 reports, of which 27 (40%) evaluated handheld computer use among medical students, 25 (37%) evaluated use among residents, and 15 (22%) pertained to a mixed audience of students, residents, fellows, and/or attending physicians (Kho, Henderson, Dressler, & Kripalani, 2006). In addition to documenting the use of PDAs in medical education and providing a list of popular software used by medical students, the authors also examined studies assessing the impact of PDA use on patient care. In regards to common decision support applications, ten studies were reviewed and demonstrated that the most commonly used were formularies, electronic handbooks (e.g., 5-Minute Clinical Consult), and medical calculator programs (Kho et al., 2006). Other important tools included practice guidelines, prediction rules, and physician order sets for common diagnoses.

One interventional study evaluated an educational outcome (Leung et al., 2003). This randomized controlled trial included 169 fourth-year medical students in Hong Kong who had limited prior use of the PDA and utilized a crossover design with three intervention arms:
Opportunistic (L)earning in the Mobile Knowledge Society
www.igi-global.com/chapter/opportunistic-learning-mobile-knowledge-society/62146?camid=4v1a