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Smart(phone) Learning Experience Among Vascular Trainees Using a Response System Application

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OBJECTIVES: Smartphones have become the most important personal technological device. M-learning is learning through mobile device educational technology. We aim to assess the acceptability of a smartphone learning experience among the vascular trainees and determine if results could inform formal teaching efforts.

METHODS: A survey of the vascular trainees at a single center was conducted following a trial of smartphone learning experience. A vascular fellow used a smartphone response system application (Polltogo, Inspirapps Inc.) to send a daily multiple-choice question to the vascular residents for 20 consecutive working days. The application allows for only one attempt from each user, and the answers are registered anonymously. However, each participant receives instant feedback on his/her response by viewing the correct answer after answering each question along with a distribution of answers among other users.

RESULTS: A total of 9 trainees participated in the trial, and all of them filled a posttrial survey. All the trainees possessed smartphones. The majority (78%) were not aware of the concept of m-learning. The mobile engagement score (number of answers received divided by total possible answers) was 145/180 (81%). All the trainees were "satisfied" or "very satisfied" with the experience, and the same number stated that they were "likely" or "very likely" to use this technology in the future. The majority (89%) agreed that such an application could assist them in preparing for their board examination. On 3 occasions, 75% or more of the participating trainees answered the multiple-choice question incorrectly, which resulted in addressing the relevant topics in the unit's weekly teaching conference.

CONCLUSION: Using smartphones for education is acceptable among the vascular trainees, and the trial of a response system application with instant written feedback represents a novel method for using smartphones for collaborative learning. Such an application can also inform program directors and surgical trainers of their trainees' learning needs. (J Surg Ed ▮:▮▮▮-▮▮▮. Crown Copyright © 2016 Published by Elsevier Inc. on behalf of the Association of Program Directors in Surgery. All rights reserved.)

KEY WORDS: smartphone, technology, education, collaboration

COMPETENCY: Medical Knowledge

INTRODUCTION

Today, we are witnessing the emergence of a mobile and connected society, particularly, with the widespread use of mobile devices and smartphones. In 2014, a study showed that 55% of Canadians owned a smartphone.[1] In 2015, the penetration rate grew to 68%, representing a year-over-year growth of 24%.[1]

In addition to surfing the Internet, smartphones possess the ability of loading various applications that can be used for entertainment and education.

There is considerable interest from educators and technical developers in exploiting the unique capabilities and characteristics of mobile technologies to enable new and engaging forms of learning. Within medical education, the application of smartphones has been rapidly expanding. In addition to online resources and podcasts, smartphones also allow for reading medical textbooks that can also be used for clinical referencing. Also, there are approximately 10,275 applications on various online stores available ranging from medical calculators, flash cards, general reference, laboratory tests, terminology, and news.[2] Several pedagogical learning theories have been associated with m-learning, one of them is the behaviorist theory. The behaviorist learning paradigm is based on learning through the reinforcement of an association between a particular stimulus and a response.[3]

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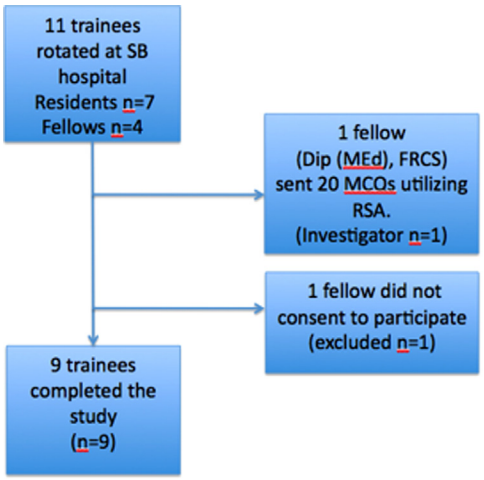

FIGURE 1. Diagram of included and excluded participants.

Such a drill and feedback model can be applied to m-learning through the presentation of a problem or presentation of the teaching material or content-specific questions (stimulus), the learner then contributes through a solution (response), and the system finally provides feedback (reinforcement). A classic example within m-learning would be a response system. We present a study that aims to assess the acceptability of a smartphone learning experience, using a response system application among the vascular trainees, and determine if results could inform formal teaching efforts.

METHODS

The study was conducted at Sunnybrook Health Sciences Centre (SHCS) during March and April 2016. Ethical approval for the study was sought and granted via SHSC. A total of 7 vascular residents and 4 vascular fellows worked in rotating shifts within the vascular unit during this period (Fig. 1). A prestudy survey revealed that all of them possessed smartphones. All the vascular residents and fellows consented to participate in a trial smartphone learning experience except 1 fellow who was then excluded. An independent vascular fellow (investigator 1) from the cohort who is board certified in vascular surgery and possess a postgraduate diploma in education used a smartphone response system application (Polltogo, Inspirapps Inc.) to send a daily multiple-choice question (MCQ) (Fig. 2) to the vascular trainees for 20 consecutive working days. The system allows the user to create a question, and the answers can be through multiple-choice or yes/no format. It also allows in creating feedback and ratings from the audience or participants. Investigator 1 created MCQs on various vascular topics after reading reference textbooks and journal articles. A text-messaging group for the participating residents and fellows using

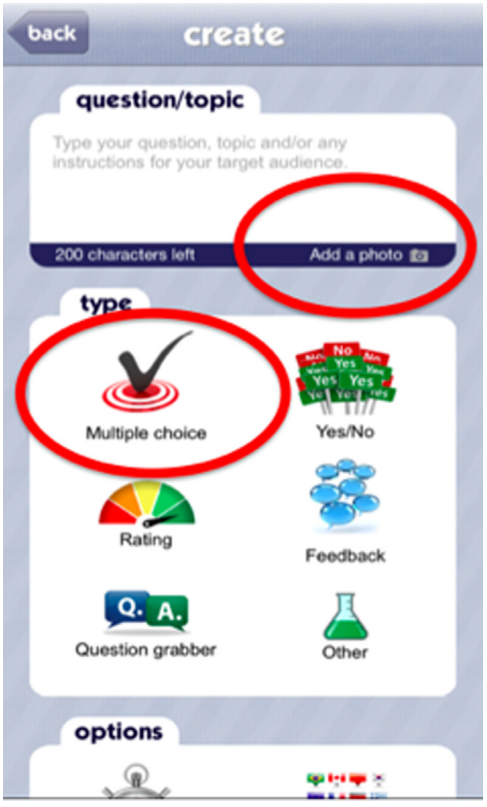

FIGURE 2. Interface of the response system application (Polltogo, Inspirapps Inc.). The application allows for a choice of different formats to construct questions and offers an opportunity to attach pictures.

WhatsApp application (WhatsApp Inc.) was created, and the group was named (Vascular MCQs) (Fig. 3). A total of 20 MCQ questions were uploaded on the response system application and disseminated to the vascular residents and fellows by sending a text message link (Fig. 3) to the WhatsApp group platform. The participants did not require downloading the application system, as simply clicking on the text link opens the question in a separate webpage (Fig. 4). A vascular surgeon staff (investigator 2) was also part of the text-messaging group and acted as a quality assurance for the MCQs sent by investigator 1. The application allows for only 1 attempt from each user, and the answers are registered anonymously. Another feature of the application is its ability to provide instant feedback to the participants for their responses by viewing the correct answer after answering each question along with a distribution of answers among other users (Fig. 5). We obtained feedback from all the participants after their 20-day trial by a questionnaire on usage and satisfaction with the smartphone learning experience, their familiarity with the concept of m-learning, and the relevance to their preparing for the board examination. In addition, we assessed the mobile engagement score (number of answers received divided by total possible answers) and analyzed the answers to assess if this can be used to inform future teaching efforts.