Delivering and Assessing Learning Material through Gquest: A Case Study on Patient Education

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ABSTRACT

Gquest is a mobile platform for administering interviewing and learning material. It relies on a model that supports adaptivity in the dialog with its users and enforces consistency rules to constrain their input. Gquest downloads its modules over the air making them available to the users, then a synchronization engine collects any input provided and sends it to a server for evaluation purposes. Thus, Gquest supports learning about user behaviors or preferences by administering interviewing material and collecting answers. However, by reversing the conversation paradigm it also supports the delivery of learning material. In this paper we illustrate a case study in which both paradigms have been exploited. First we implemented a guide for training patients on a rare disease called amyloidosis, and second we integrated a plain questionnaire at the end of that guide to assess the quality of learning perceived by the user.

Keywords: Computer-Mediated Communication, eHealth Policy and Practice, Evaluation and Assessment, Mobile-Learning Platforms, Multimedia Applications

INTRODUCTION

The widespread diffusion of mobile devices has determined an increasing emphasis on Mobile Learning (m-Learning) that is defined as “learning delivered or supported solely or mainly by handheld and mobile technologies such as personal digital assistants, smart-phones or wireless laptop PCs” (Traxler, 2007). Thus m-Learning proposes a new model for education which is independent of time and environment (Holz-

Medical education and clinical practice, due to the intensive use of knowledge they exert (Schreiber, van Heijst, Lanzola & Stefanelli, 1993) and the different forms involved (Lanzola & Stefanelli, 1993), represent two possible areas for the exploitation of m-Learning (Bloice, Simonic & Holzinger, 2013). Several studies point out, for example, that there is a high percentage of outpatients not taking prescribed medications (Vermeire, Hearnshaw, Van Royen & Denekens, 2003; Di Matteo, 2004) and in the majority of cases the cause is ascribed to their low literacy (Gazmararian, Kripalani, Miller, Echt, Ren & Rask, 2006). Thus, an important area of m-Learning addresses patient literacy and clinical practice, and applications are starting to appear both for patients and doctors. On the patient’s side they are often used to fill in diagnostic surveys involving outpatients who spend most of their time away from home, so that mobile devices prove to be an optimal solution (Holzinger, Kosec, Schwantzer, Debevc, Hofmann-Wellenhof & Frühauf, 2011). On the clinical staff side, apart from applications used to access patient records and laboratory reports, mobile appliances are beginning to be adopted as a means of teaching, learning and practicing. Some applications see mobile devices as multimedia textbooks which can be used to improve resident education and patient care while others see tablets being used to visualize and plan clinical activities such as surgeries (Sadri, Murphy & Odili, 2012; Davis, Garcia, Wyckoff, Alsafran, Graygo, Withum, & Schulman, 2012). Furthermore, the literature already reports that the use of specific applications by resident doctors helps them in learning faster and in improving both the perceived and the actual effectiveness of their actions (Patel, Chapman, Luo, Woodruff & Arora, 2012).

### Learning Support through Mobile Devices

Several theories have been conceived for understanding and explaining the learning process. Behaviorism (Rogers & Skinner, 1966) focuses on *programmed instruction* and is centered on the active role of the teacher with respect to that of the learner. The teacher sends stimuli to the learner, who acts as a passive participant, until the desired response is achieved. According to cognitivism (Tudela, 2004) the learner plays instead an active role and participates in the learning process, elaborating answers on their own. That theory promotes breaking down complex concepts into smaller parts, facilitating their management by the learner. Constructivism (Steffe & Gale, 1995) emphasizes the *construction* of new knowledge by the learner, as an autonomous process going through their own personal experiences and interactions with the outside world. Finally, situated cognition considers that learning is mostly influenced by the *situation* in which it occurs (Brown, Collins & Duguid, 1989). While in traditional learning several theories are combined on the basis that each one has advantages and drawbacks (Guey, Cheng, & Shibata, 2010), when it comes to using technology, constructivism is mostly adopted (Koohang, Riley, & Smith, 2009). This happens because according to it the learner autonomously selects and interprets every new piece of information in the light of their own previous experiences, and the instructor only plays the role of a facilitator. In the medical domain Kala (Kala, Isaramalai & Pohthong, 2010) developed a model rooted on the constructivist theory supporting nursing education. The technology is also used in combination with situated cognition since it may speed up the learning process in complex scenarios by reproducing the actual context in a simulated environment. This is particularly useful in the medical domain where simulated patients are used to demonstrate the effects of interventions without any risk for real ones.
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