Chapter 2

A Mobile Learning Content-independent Versatile Ubiquitous System (CiVUS)

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ABSTRACT

Mobile learning (m-learning) introduces the idea of learning from virtually anywhere, regardless of the in-motion learner. This paper presents the development and impact of m-learning system capable to deliver personalized contents to the learner, called Content-independent Versatile Ubiquitous System (CiVUS). This solution promotes communication between learners and their teachers by encouraging learners to share self-made multimedia contents. Enabling interactivity makes mobile devices suitable for the development of collaborative activities amongst engineering students. CiVUS intends to offer support for engineering subjects study. It can be used inside or outside classrooms by learners and teachers, due to the mobility of these devices, at the time they find more suitable. The system has been validated and evaluated through a real usage. The study group collected answers from 10 teachers and 87 engineering students of the University of Beira Interior, Portugal and the University of Valladolid, Spain. The results demonstrate that the majority of the inquired people totally agree (all items over 72% for professors and 74% for students).

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1. INTRODUCTION

Advancements in Information and Communication Technologies (ICT) introduced several areas to e-learning environments such as ubiquitous learning (u-learning), mobile learning (m-learning), and television learning (t-learning). These technologies enable learners to access learning contents through a variety of devices with more flexibility and consistency (Chang et al., 2007; Kahigi et al., 2008).

E-learning and m-learning have the potential to reduce the transactional distance between learner and instructor and enable learning experiences that are more collaborative, more richly contextualized and continuously accessible (Hui et al., 2005; Barreto, 2003; Serrano-Fernández, 2009).

For people who have left University early, for those who have jobs and cannot afford to stop working or even those that need to attend to the company’s latest training program, it would be important to have a tool that would enable them to learn at any time of the day they find suitable, regardless of their location. For those people and many others in similar situations, the system introduced in this paper intends to find a solution for this challenge.

M-learning is an ideal solution for those who do not have permanent access to a desktop computer, who are usually in transit and have a need or a desire to learn. There are many mobile applications that target a particular area. If there is an application with visual contents to teach mathematics and there is another with audio contents to teach someone a new language, why not try to reunite them and make one versatile mobile application with capabilities to show both types of contents? The research work behind this paper focused on finding such a solution for this problem.

This paper presents the Content-independent Ubiquitous Versatile Learning System (CiVUS). It intends to offer support for subjects study such as data transmission, software engineering, etc. A device can be used both in and out of the classroom promoting interaction among learners, and also between learners and teachers. It is a m-learning system that can help not only at University but it is also ideal to people that just have the desire to learn and wish to do so anywhere, when they find more suitable.

The main asset presented by this system compared to others is its versatility and its ubiquity, which makes it ideal to download contents from a fixed platform and increase the learning experience. Since mobile devices are small and can be carried all the time, allowing anywhere-anytime learning.

This application is capable of delivering multimedia contents to the users regardless of their location. The multimedia learning contents are encapsulated into a learning module, which makes the system content-independent and thus suitable for any type of engineering learning subject.

The remainder of this paper is organized as follows. Section 2 elaborates on the background about the topic while gathers contributions to this work. Section 3 describes the methodology to develop the proposed platform. Section 4 focuses on the results achieved (CiVUS platform, validation, and system evaluation). Finally, Section 5 presents a discussion, conclusions, and future work.

2. BACKGROUND

2.1. Mobile Learning (m-learning)

Mobile communication technologies are changing the way people educate themselves. Today’s learners, those born after 1982, are ‘digital natives’. They are usually digitally literate, ‘always on’ and used to perform multiple tasks simultaneously, like playing computer games while watching TV. Learning outside the classroom targets an increasingly mobile population interacting with
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