The Construction of a Personalised and Social U-Learning Environment for Third Level Education

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ABSTRACT
This paper presents a ubiquitous learning (u-learning) system, the “Personalised Ubiquitous Learning Platform” (PULP), which integrates collaborative and social learning for the enhancement of the third level educational learning experience. University College Dublin (UCD) provides its students with managed learning environments (MLEs) and adaptive learning via UCD Horizon which enables students to take different courses from different colleges throughout the university. The main objective of this platform is to complement the current MLEs with a single supported intelligent and personalised ubiquitous learning environment that will promote and make provisions for adaptive and collaborative learning, human computer interaction on mobile and desktop clients anywhere and anytime. The system aims to enhance the students’ learning experience in third level educational environment by employing personalisation techniques such as the agent-oriented recommendation technique to engage students and help them access the content material for their studies.

Keywords: Agent-Oriented Personalisation, Collaborative e-Learning, m-Learning, Multi-Agent System, Social e-Learning

INTRODUCTION
There is a huge demand for ubiquitous and personalized distant learning and the internet has become the channel for distributing content more efficiently anywhere, anytime in the 21st century (Bates, 2000). E-learning tools are used to enhance learning experience in second and third level educational environments all over the world (Keegan, 2008). The traditional learning system is too restricting for modern students. These students need to multi-task and manage their time. Moreover, due to short attention span modern students find it hard to concentrate on a single task for a long period of time in a single space. Some of these students also have to work part-time and they prefer flexible learning process in order to balance their work rota and college timetable (Mifsud & Casey, 2005). Furthermore, since advanced wireless and mobile technologies now make it possible to offer learning outside the traditional learn-
ing environment (Amin et al., 2006), learning on the go or during flexible hours is feasible and can enhance learning experience. Quality pedagogical techniques enhance students’ abilities and save students time during learning process and period.

University College Dublin (UCD) has made a unique transition from its once traditional educational metaphor to an increasingly modularized educational framework. UCD adopted a modularised and credit-based educational system known as UCD Horizon that provides adaptive learning. Access to the vast array of resources available throughout each college of the university has been facilitated through the establishment of a fast and efficient wireless local area network. This offers great opportunity for mobile clients’ users and e-learning facilities. The vast scale of the undergraduate community undertaking third level courses at the university requires access to the numerous resources available across each distinct school hence resources must be seamlessly integrated into one learning management system.

UCD provides managed learning environments (MLEs), Blackboard and Moodle, that act as resource repository and also as a learning environment that aids students through their learning stages. Research (Ayoola et al., 2008) has shown that these MLEs lack personalisation, efficiency and interoperability. The majority of the services the MLEs provide, such as collaborative learning, are redundant because tutors and students are not making use of them. Since students’ information are scattered all over each MLE, the MLEs couldn’t provide content that adjust to students’ needs consistently; the only similar information that the MLEs have about each student are their names and email address. The MLEs don’t exchange information about the students that can help provide a consistent student profile that will enable better personalized content delivery. Furthermore, the skills learnt to use one MLE is not transferable to other mobile learning environments and the existing MLEs are not ubiquitous enough for the current students who are mobile users because they only designed for desktop clients.

To enhance UCD’s current MLEs, a single supported learning environment, personalised ubiquitous learning platform (PULP), was proposed and designed to provide personalised content, collaborative activities and services. The purpose of this paper is to discuss PULP with focus on integration of intelligent agents and intelligent user interface in the platform for the enhancement of content recommendation and learning experience in a ubiquitous learning environment for third level education.

RELATED WORK

E-learning is integrated into mobile clients such as game consoles, mobile phones for flexible learning (Laroussi, 2004). Since mobile internet has become a norm, distance learning has been enhancing the education of people living in different parts of the world, including under-developed and excluded regions. Mobile learning (M-learning) is highly linked with information retrieval, content delivery, ad hoc questions and answers, notes, comments and generally communication between learning communities and etc (Yuen & Wang, 2004).

A Leonardo da Vinci project provided m-learning and training on wireless devices that solved the problem of presenting m-learning by developing a 1000 A4 page course on PDAs (Personal Digital Assistants). It used Microsoft Reader to create a study environment for students. This system provided assignment feedback and enabled communication between students, lecturers and fellow students (Keegan, 2008). Issack et al (2006) developed a prototype application that is made up of a web-based interface, mobile access interface and an adaptation mechanism which provides just-in-time personalized content to students to blend mobile and e-learning into a single computer-based infrastructure.

Personalisation and collaborative learning are among the techniques used to enhance distance learning. Personalisation is important in learning systems; it is essential for an educational system to adapt to users automatically
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