Learning with wireless mobile devices and social software

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The paper outlines the beginning of research into the synthesis of mobile personal technologies, social technologies, and constructivist pedagogies, and briefly explores the potential for creating student-centred collaborative learning communities using wireless mobile devices (e.g. PDAs, Ultra Mobile PCs, mobile phones and smart-phones) and social software (e.g. blogs, RSS, instant messaging, moodle, elgg etc…). Instead of simply re-purposing content to fit small screen wireless devices, a wide range of social software tools can be used to facilitate social constructivist pedagogies informed by constructivism, social constructivism, communities of practice, and a conversational model of learning. Many social software services provide mobile versions of their services, and there are a growing number of dedicated services for mobile devices, as well as Java, Symbian, Palm OS, and Windows mobile client applications. Several example scenarios are outlined.

Keywords: social software, wireless, mobile, cell phones, PDAs

Introduction

This research project will investigate the potential for establishing the use of wireless mobile devices (WMDs) as core ICTs (Information and Communication Technologies) within tertiary education courses. The potential of mobile devices integrated with a campus wireless network can facilitate the use of e-learning tools to enhance tutor–student and student–student communication, collaboration, reflection and critique. Student productivity will be enhanced by the provision of a ubiquitous computing environment.

The research project will involve a series of reflective trials (action research cycles) using WMDs to harness the potential of current and emerging social constructivist e-learning tools (e.g. Moodle, blogs, wikis, podcasting etc…). The research project is based upon explicit social constructivist pedagogy (Bijker, Hughes & Pinch, 1987; Lave & Wenger, 1991; Vygotsky, 1978; Wenger, McDermott & Snyder, 2002), and aims to develop a strategic implementation plan for incorporating WMDs into tertiary education and sound pedagogical guidelines. The underlying social constructivist tools are not bound to any single WMD technology, or specific learning context, and therefore the outcomes/strategies/pedagogies identified by the research will be generalizable and transferable. It is postulated herein that WMDs are disruptive technologies that are useful in challenging established pedagogies, providing a catalyst to move tertiary education towards social constructivism.

While there are several examples of integration of Palm, PocketPC, smart phone and laptop devices in tertiary education in overseas institutions, few are based on theoretical models of learning. It has also been noted that the majority of mobile learning trials have not used rigorous evaluation techniques, have failed to measure student learning, and have not attempted to provide a well-defined pedagogical basis for the research or learning activities used (Kukulsa-Hulme & Traxler, 2005; Traxler & Kukulsa-Hulme, 2005). This project attempts to address these concerns.

Research questions

1   What are the key factors in integrating WMDs within tertiary education courses?
2   What challenges/advantages to established pedagogies do these disruptive technologies present?
3   To what extent can these WMDs be utilized to support learner interactivity, collaboration, communication, reflection and interest, and thus provide pedagogically rich learning environments that engage and motivate the learner? To what extent can WMDs be used to harness the potential of current and emerging social constructivist e-learning tools?

Background

Social software

'Social software' – interactive collaborative software – is one of the key features of what has been termed 'Web2' (O'Reilly, 2005). A good overview of the potential of social software in education is the chapter: 'Social Networks' by Leon Cych (2006). Web2 is about: moving beyond content delivery to personal publishing, ease of use, interactivity, collaboration, sharing, and customisation.

Wireless Mobile Devices (WMDs) coupled with open-source social software tools potentially provide the basis for enhancing teaching and learning in virtually any discipline. The use of social software in education has gained a lot of recent interest (Alexander, 2006; Alexander *et al.*, 2006; Attwell, 2006; Bryant, 2006; Cych, 2006; Mejias, 2006; Wilson, 2006). Jafari, McGee & Carmean (2006) recently proposed a model for a next generation e-learning environment that integrates social software tools.

> Stakeholders across the spectrum want an anytime, all-the-time, personalized experience of teaching and learning – one that utilizes all the currently available social tools, intuitive tools, smart agents, and interactive environments of Web 2.0 and social computing. In short, faculty, students, and administrators are waiting for an e-learning environment that is smart, environmental, archival, multi-modal, collaborative, and mobile (Jafari et al., 2006).

The popularity of these social, web-based tools is demonstrated by the design and support of current and soon to be released consumer mobile devices. An example is the inclusion of RSS news reading capability into Nokia (Nokia Lifeblog 2.0) and Sony Ericsson cell phones, and the Sony PSP. The next generation of Sony Ericsson cell phones will feature integrated mobile photo blogging (Gohring, 2006), and Nokia's N73 cell phone allows direct posting of captured photos to Flickr. Additionally, the two 'giants' of the Internet, Google and Yahoo, are both positioning themselves for the wave of wireless mobility by developing a suite of mobile social networking tools (see http://mobile.google.com and http://mobile.yahoo.com).

Wireless mobile devices

E-learning tools have been established as valuable enhancements to both distance and face-to-face tertiary education, particularly in facilitating collaborative, reflective, student-centred learning environments (JISC, 2004).

> A review of current practice suggests that mobile and wireless learning is the natural next step wherever institutions and practitioners have already adopted e-learning (Knight, 2005).

Wireless mobile devices include: the new wireless enabled ultra mobile PCs (UMPC Community, 2006), cell phones, smart phones, PDAs, and wireless enabled portable media devices. While the use of wireless laptops has been well established (but still mostly in an ad hoc mode within the tertiary education scene), today's WMDs potentially provide all the processing power and communication applications that students need, at a lower cost, greater portability and longer battery life than a laptop computer. Additionally, a WMD is not made redundant by a laptop or desktop computer, but is usually designed to complement them. A recent wireless mobile device trial at Unitec indicated that the key aspect of wireless mobile device utilization is their connectivity. Students value anytime anyplace connectivity with classmates, lecturers, and resources.

Pedagogical framework

Teaching and learning innovations are best implemented when informed by learning theory. A pedagogical framework for implementing social software tools via wireless mobile devices can be developed by drawing on concepts from constructivism, social constructivism, communities of practice, and a conversational model. There are many resonances between the use of social software in education and the development of communities of practice. Lave and Wenger assert that passive community members learn from the active members of the community, and are gradually brought into an active role in the community. This is termed legitimate peripheral participation. Attwell (2006) draws a comparison between the concept of legitimate peripheral participation and Vygotsky's (1978) zone of proximal development. Wenger also introduces the concept of the technology steward as a key catalyst in this process.

The technology steward

The 'technology steward' (Wenger et al., 2005) is a member of the community with a grasp of how and what technologies can enhance the community. They act as a guide to the rest of the community as the community learns to utilize and benefit from technology. The role of the technology steward is seen as critical to the success of integrating the use of WMDs and social software in education. The idea of communities of practice also provides some theoretical frameworks for guiding the choice of technologies in a learning situation. In education, the technology steward role would most beneficially be that of the teacher. However when the teacher is not up to speed with the technology utilized by the community, or does not engage with it, then the technology steward role defaults to someone else within the community or class. The problem then is the potential for the community or class to go off on a tangent, from lack of pedagogical guidance. To facilitate the technology steward role in each of the research trials, the researcher will act as an assistant technology steward to the teacher of each group of students, and communities of practice will be established.

Implications for practice

To summarize: Wireless networks have been described as 'disruptive technologies', and so have the social tools that have developed (blogs, wikis etc…) (Alexander, 2004; Fielder, 2004; Lamb, 2004). Their disruptive nature forces a rethink of pedagogical strategies and relationships in education. Wireless mobile computing facilitates the development of collaborative learning communities, enhancing student–student and student–tutor communication and interaction. Wireless Mobile Devices coupled with open-source social software tools potentially provide the basis for enhancing teaching and learning in virtually any discipline. Below we suggest four possible scenarios for utilizing social software with different wireless mobile devices (Table 1). Further details and ideas for implementation can be found at http://ltxserver.unitec.ac.nz/mediawiki/index.php/MlearningOverview. The author's wiki page also provides an overview of the various technologies involved, and more ideas on using social software on mobile devices. The outcomes of these trials will be the subject of future papers.

Table 1: WMD trials

Trial	Course	Participants	WMD	Social software	Summary
1	Diploma of Landscape Design, Unitec	18 students, 2 academic staff, researcher.	Palm TX with folding wireless keyboard for text entry	Moodle Splashblog.com Litefeeds.com Blogger.com Letmeparty.com AIM, MSN	Use of WiFi PDA to create reflective Blogs. Group members subscribe to each other's blogs and to a central course blog using an RSS reading Java application. Deliver basic course content via Moodle, and encourage students to experiment with capabilities.
2	Year Two, Bachelor of Product Design, School of Design, Unitec	18 students, 2 academic staff, researcher.	Palm TX paired with a bluetooth 3G mobile phone	Moodle, Elgg Splashblog.com Blogger.com Litefeeds.com Letmeparty.com AIM, MSN	Use a combination of a WiFi PDA paired with a bluetooth enabled 3G-cell phone, for anywhere, anytime connectivity to social software tools. Students establish reflective blogs, subscribe to each other's blog via RSS, and upload photos to splashblog.com.
3	Year Three, Bachelor of Product Design, School of Design, Unitec	18 students, 2 academic staff, researcher.	WiFi & 3G enabled UMPC – e.g. Samsung Q1	Moodle, Elgg Blogger.com Flickr.com Meebo, AIM, MSN Newsgator.com Pbwiki.com YouTube	Use a WiFi enabled UMPC (Ultra Mobile PC), with 3G data card for connectivity beyond WiFi access points, interacting with the full range of social software options – including online newsreading, video uploading via YouTube, and instant messaging options.
4	School of Sport, Unitec	18 students, 2 academic staff, researcher.	WiFi & 3G enabled Palm Treo	Moodle, Elgg Splashblog.com Blogger.com Litefeeds.com AIM, MSN	Use a WiFi/3G 'smart phone', for anywhere, anytime connectivity to social software tools – as in Trial 1, but with the flexibility of 3G roaming.

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