MOBILE WEB2 PEDAGOGIES

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This paper argues that the success or failure of mobile technologies within tertiary education pivots upon the successful modeling and integration of the technology into the delivery and assessment of a course. Mobile implementation choices must be based upon a sound pedagogical framework, and supported by a 'technology steward'. This paper outlines a pedagogical framework for mobile teaching, and its alignment with web2 social software. Lessons are drawn from two mobile trials, and example web2 applications are briefly outlined.

1 Introduction

When attempting to use technology to engage today's learners, there is often a disconnect between the techno-savvy of the learners and the lecturers. This is illustrated by the following description of today's learners and comments from a selection of lecturers:

1.1 Today's learners

> A junior at the university, Eric wakes up and peers at his PC to see how many instant messages (IMs) arrived while he slept. Several attempts to reach him are visible on the screen, along with various postings to the blog he's been following. After a quick trip to the shower, he pulls up an eclectic mix of news, weather, and sports on the home page he customized using Yahoo. He then logs on to his campus account. A reminder pops up indicating that there will be a sociology quiz today; another reminder lets him know that a lab report needs to be emailed to his chemistry professor by midnight. After a few quick IMs with friends he pulls up a wiki to review progress a teammate has made on a project they're doing for their computer science class. He downloads yesterday's chemistry lecture to his laptop; he'll review it while he sits with a group of students in the student union working on other projects. After classes are over he has to go to the library because he can't find an online resource he needs for a project. He rarely goes to the library to check out books; usually he uses Google or Wikipedia. Late that night as he's working on his term paper, he switches back and forth between the paper and the Internet-based multiplayer game he's trying to win (Oblinger & Oblinger, 2005).

1.2. Today's Lecturers

The following is a selection of anonymous comments from lecturers regarding their comfort levels with integrating technology into their teaching:

Lecturer 1: “When people talk IT stuff, for me its like a foreign language – I don’t even know if IT is the label I should be using”.

Lecturer2: “In my Diploma programme we need more flexibility, we have a lot of students who want to come in at odd hours and are working, and this technology stuff should offer my students a lot. However I’m scared of it. I don’t want to just dive in. In the past I’ve always hung back because I always think there’s going to be bugs in the system”.

Lecturer3: “I guess I feel a burning desire to learn about this stuff, but I’ve never created the space to do it, and I suppose that’s an excuse”.

Lecturer4: “I just feel totally out of touch with the technology, particularly when I see what my kids can do, and I haven’t really had any motivation to go about updating myself. But I guess for me one of the issues is whether the technology overshadows good pedagogy, and I want to be absolutely sure that technology enhances pedagogy rather than gets in the way of it”.

2 Developing a Mobile Pedagogical Framework

Overcoming the technology disconnect between learners and lecturers/teachers requires intentional planning and staff development, and forces a rethink of traditional pedagogies used in tertiary education. This is particularly important with the growing use of mobile devices by today’s students.

Mobile devices are inherently social, enabling rich social interaction, and the potential for enhancing group work and communication within educational settings. Today’s learners are constantly connected to their social networks via their wireless mobile devices. How can educators harness the educational potential of such an environment?

> Content delivery to mobile devices may well have a useful place in m-learning, however, there is an imperative to move from a view of e- and m-learning as solely delivery mechanisms for content… Handheld devices are emerging as one of the most promising technologies for supporting learning and particularly collaborative learning scenarios. (Hoppe *et al.*, 2003)

2.1 Creating collaborative mobile learning communities

Various approaches to integrating mobile technologies into education have been explored, including:

- Pushing information (via SMS)
- Pushing content (via synchronization)
- Repurposing content for smaller screens (video, enhanced podcasts…)
- Development of mobile Learning Objects (Flash Lite, Java…)
- Creation of test & drill exercises - concept reinforcement
- Communication tools
- Creative (get the students creating the content and sharing it)
- Collaborative (supporting group/team work)

- Connected (implies wireless)

2.2 Informing pedagogy with theory

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 (Bruner, 1966; Piaget, 1973), social constructivism (Vygotsky, 1978), communities of practice (Wenger, 2005), a conversational model of learning (Laurillard, 2001), and the social construction of technology (Bijker, 1995).

Thus a mobile (m-learning) pedagogical model will focus upon enhancing communication, collaboration, and will be student-centred.

> "New mobile and context-aware technology can enable young people to learn by exploring their world, in continual communication with and through technology" (Sharples, 2005).

Two issues that do not appear to have received much attention in mobile educational case studies are the role of the technology steward, and the impact of the social construction of technology on the adoption of mobile devices in education.

2.3 The importance of the Technology Steward

Communities of Practice can be enhanced with the use of appropriate communications technologies when under the guidance of a 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. 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. The technology steward thus forms a pivotal role in the successful integration of mobile teaching.

One of the biggest challenges in taking this approach is the changing role of the teacher. This includes the need to become techno-savvy in order to model the educational use of the technology, particularly if the teacher is also the technology steward for the class/community. Support structures to aid the teacher's technology development can be created utilizing the concept of communities of practice. A community of practice can be based around the course/class: incorporating the teacher, technical support (if outside the class), and students. A community of practice that provides teacher support can also be created from a group of like-minded teachers.

An example of the establishment of an educational community of practice is illustrated by the authors YouTube video presentation (Cochrane, 2006a).

2.4 Social Construction of Technology

Technologies (hardware and software) should be chosen according to their fit with the underlying pedagogies guiding the course delivery. However, often there are more factors influencing the ultimate choice of technologies used in a learning situation than those that present the best pedagogical fit. Often the 'best' technology for a particular situation does not become the mainstream choice. For students the decision to purchase a mobile device is influenced by their peer network and the perception of how cool the device is. The affordability of data charges is also important to budget conscious students. The social construction of technology (Bijker, 1995) is one approach to analyzing issues influencing technological development and survival.

In summary, a social-constructivist pedagogy needs to be put into practice, and contextualized for student learning and technology preferences. Mobile devices, activities and software that align with a social constructivist approach to teaching and learning should be targeted. This leads to the potential partnership between mobile wireless devices and web2 social software. Historically mobile educational case studies have focused upon creating mobile applications and rich media content suitable for small screens, requiring high levels of specialized expertise. Meanwhile a revolution has been underway with the convergence between web2 social software and mobile devices. These mobile web2 services enable constructivist collaborative environments with very little technical overhead required by the lecturer or students.

3 Web2 Social Software

'Social Software' (interactive collaborative software) is one of the key features of what has been termed 'Web2' (O'Reilly, 2005). Examples of current and emerging social software tools include blogs, wikis, RSS, instant messaging, podcasting, social book marking, etc… (Farmer, 2004; Glogoff, 2005; Kaplan-Leiserson, 2004). The key characteristics of social software fit well with the mobile pedagogies described above, making the combination of mobile web2 a natural and relatively simple approach to creating collaborative learning communities.

Web2 is about:
* Moving beyond CONTENT
* Ease of use
* Interactivity
* Collaboration & sharing
* Customization
* Personal Publishing

Wireless Mobile Devices coupled with open-source Social Software tools potentially provide the basis for enhancing teaching and learning in virtually any discipline, providing an environment that stimulates reflection, critique, collaboration, and user generated content – i.e. a social constructivist environment.

3.1 Examples of Mobile Web2

Mobile web2 tools that can be utilized with minimal technical support, and that support a wide range of mobile platforms include:

- Mobile blogging
- Mobile Google Maps
- RSS aggregators (online or via downloadable client applications)
- Mobile photo blogging
- Mobile video blogging
- Instant messaging
- Mobile bookmarking
- Podcasting (Student generated)
- QRCodes for camera phones

The popularity of these social, web-based tools is demonstrated by their design and integration into 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 latest Sony Ericsson cell phones 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 (2006) and Yahoo (2006), are both positioning themselves for the wave of wireless mobility by developing a suite of mobile social networking tools.

The recent release of the Opera mobile and mini web browser (Opera Software, 2006) for almost every mobile phone and PDA has opened the door for viewing many standard web sites and web2 services on mobile devices without any translation. In particular, the Moodle LMS (Dougiamis, 2005) renders very nicely on a small screen device running Opera mini.

One of the more innovative free mobile tools is the kaywa reader, which allows a camera phone to scan and interpret QRcodes. QRcodes can either represent a paragraph of text, or a URL.

The following table briefly outlines some example social software options for various mobile devices. For a more in depth overview and discussion of mobile web2 applications, and a QRCode example, visit the author's wiki pages (Cochrane, 2006b, 2006c).

Table 1: Social Software examples for a range of mobile devices.

Device	Blog options	RSS	Instant Messaging	Social Book marking	Web Services – Moodle, Elgg, Wikis etc…
Cell phone	1. SMS via letmeparty 2. mobileBlogger (Java) 3. MoJungle – (image & video via SMS) 4. Mobispline 5. Flickr via email 6. ShoZu	1. Litefeeds –set-up feeds on web, download Java reader to cell phone 2. RSSReader (Java) 3. Google reader Mobile – via Opera mini browser.	1. eMSN (Java) 2. IM+ (Java) 3. Mobispline	1. Deliciousmona.com 2. mobilicio.us – delicious formatted for mobile devices	1. Opera Mini (Java) 2. KaBlog (Java) – supports Elgg Blog via Metaweblog API
Smart phone	1. Built-in app 2. All above 3. SplashBlog	1. Built-in app 2. All above	1. All above 2. Yehba	1. mobilicio.us	1. All above 2. Opera for Symbian or PPC 3. mobile google 4. mobile yahoo
WiFi PDA Palm OS	1. uBlog 2. Vagablog 3. SplashBlog 4. MoBlog	1. LiteFeeds 2. QuickNews 3. mRSS	1. Agile Messenger 2. MunduIM 3. Verichat	1. mobilicio.us	1. Blazer 2. Opera Mini 3. Xiino
PSP	1. Built-in web browser login to Blogger.com	1. Built-in RSS reader	None yet	1. Built-in web browser & RSS reader	1. Built-in web browser

4 Lessons Learnt

At Unitec, the author is in the process of implementing mobile web2 action research trials over the next two years (Cochrane, 2006c). In preparation for this, two pre-research trials were run during 2006. These trials prompted some of the thinking behind this paper, particularly regarding the importance of the role of the technology steward when introducing new technologies and pedagogies into existing courses.

- Do not assume students' technology skills. While most students will use instant messaging to communicate with peers, their knowledge of enabling technologies such as RSS can be surprisingly limited.
- Timetable ample preparation and on-going support. Weekly technology integration tutorials are suggested here.
- Lack of Tutor engagement or integration of the technology de-motivates students. Tutors must model the use of the technology and be actively engaged in the collaborative community.
- Do not assume student connectivity – a surprising number of students still have no internet access at home, and limited access to campus WiFi hotspots.
- Do not over-complicate the integration of the technology into the course delivery and assessment. Keep it simple.
- Test the LMS server external connection settings – make sure they are assigned appropriate priority on the network/firewall.

4.1 Challenges

When implementing mobile learning environments there are many practical and big picture issues to consider.

- Small screen size - how to view/present information in a class setting?
- Mobile device setup – who will install software and configure the devices...?
- Personal nature of the devices.
- Dealing with the variety of device models (particularly mobile phones).
- Technical support.
- Meaningful/relevant integration into the course delivery and assessment.
- Student preferences.
- Which technology to choose in an ever changing field.
- Network/security issues.
- Moving beyond repurposing content to creating collaborative mobile learning environments.

5 Conclusions

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, providing an environment that stimulates reflection, critique, collaboration, and user generated content (i.e. a social constructivist environment). However, the crucial element in the success of implementing mobile learning is the intentional integration into the teaching and learning aspects of a course.

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