Distance learning at times and places chosen by the learner: Adapting resources and learner behaviours for working with mobile digital devices

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Research question

This DEHub funded research project investigates the potential of mobile devices, in this case the 4th generation iPod Touch, to enhance student learning by increasing time on task for interactions that promote learning at times and locations more convenient for the learner. The evaluation will enable USQ and CQU to assess the feasibility of the integration of such devices into learning and teaching systems.

Why the research is important?

There has been substantial research conducted into the use of Information and Communication Technologies (ICT) in general and mLearning in particular, as they relate to higher education. Recent research is also beginning to explore the impact of Web 2.0 technologies. What is less prevalent is research concerning the nexus between Distance Education, Web 2.0 technologies and mLearning, particularly as this nexus relates to students studying predominantly online and who are engaging in undergraduate university courses from a distance.

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The project specifically aims to investigate online (distance) student engagement with course content, peers and instructors that are facilitated by mobile computing devices such as the iPod Touch. Opportunities to enhance learning for distance education students will be identified. The project will address the following seven research questions:

1. How does the introduction of the iPod Touch affect distance learners' interactions with course content?

2. How does the introduction of the iPod Touch affect distance learners' patterns of communication with instructors and peers?

3. Which capabilities of the mobile devices are valued by distance learners and for what purposes?

4. What constraints are evident in the use of the mobile devices to support distance learning?

5. What modifications to university study resources are necessary or desirable to optimise their use on the iPod Touch or similar mobile devices?

6. What adjustments to course design would enable most effective use of the iPod Touch or similar mobile devices to support learning?

7. What costs and associated issues need to be addressed at an institutional level for scalability?

Mobile Learning

Mobile Learning (mLearning) can be defined as "the intersection of mobile computing and e-learning that includes anytime, anywhere resources; strong search capabilities; rich interaction; powerful support for effective learning; and performance based assessment" (Abernathy, 2001, p. 1). In an mLearning context, the learner is considered to be mobile and learning occurs wherever the learner is. Secondly, the onus is on universities to make resources available that can be accessed from any place, at any time.

A substantial body of research exists which outlines the potency of mobile devices to support student learning with researchers suggesting that the ubiquitous use of a handheld wireless device has the potential to fundamentally change teaching and learning (Cochrane, 2005; Fung, Hennessy & O'Shea, 1998). Educational

research regarding ubiquitous use of handheld devices has documented changes in pedagogy with teaching styles being more student-centred (Norris & Soloway, 2004); project oriented (Norris & Soloway, 2004; Swan et al., 2005) and more inquiry-based (Norris & Soloway, 2004). In terms of specific effects on students, research has identified improved motivation by students who participated in activities with mobile tools (Swan et al., 2005; Vahey & Crawford, 2002) and engagement by students in these tasks (Russell et al., 2004; Swan et al., 2005). Students using handheld devices are also more independent in their learning (Swan et al., 2007) and work more collaboratively with other students and with their teachers (Fung, et al., 1998; Sharples, 2000; Vahey & Crawford, 2002). Despite this research, it remains unclear whether the kinds of students who engage readily with mobile technology would ordinarily be independent learners. A secondary consideration is that this research has yet to be conducted substantially with online undergraduate students with ready access to mobile devices.

Web 2.0 in Higher Education context

Although Information and Communication Technology (ICT) usage in universities is not a new phenomenon, the past five years has seen a substantial expansion in the number of universities offering courses solely online, including USQ and CQU where this research takes place. Accompanying this push into the online learning space is the use of Web 2.0 technologies.

Frederickson, Reed and Clifford (2005) and McLoughlin and Lee (2010), suggest that there is a heightened student expectation of support in online courses. Despite some suggestions in the literature (Berk, 2010) that the current generation of university students is highly competent in the use of ICT, other research (Bennett, Maton & Kervin, 2008; Kennedy et al., 2009) suggests that the categorisation of students as "digital natives" is not clear. Regardless of the relative technical skills of the students, once a course is delivered in online mode there is a subsequent increase in the expectations that ICT will be used to scaffold student learning (Frederickson, et al., 2005) which may be more easily facilitated

using Web 2.0 technologies. A further contribution of Web 2.0 technology for a successful learning experience relates to its potential to support the social experience of students who are studying online. Wilcox et al. (2005) identified a range of factors which impacted on the online student experience including learning, teaching and assessment strategies; the quality of staff student relationships; and the use of collaborative approaches to student learning. In addition, a significant theme which emerged from their work was importance of providing support for the social experience of online students (see also Rossi, 2009). Further research is required on the impact of Web 2.0 technologies in relation to online learning facilitated by mobile devices.

Conceptual Framework underpinning the research project

University courses can be conceived of as sites in which learning occurs as a social and cultural endeavour. Activity Theory, a specific socio-cultural theory, is used as a framework to analyse, synthesise, and evaluate the student interaction with their university learning in this research. Engeström (1987) suggests that socio-cultural sites can be examined using six key elements (Figure 1). In the system, the subject uses tools to attain a specific object in a community context with specific rules and roles of responsibility. Contradictions and tensions between these various elements are resolved to attain a specific outcome.

Activity Theory has been used widely as a conceptual and methodological tool in educational research contexts from the Early Years through to Tertiary Education (see Georgeson, 2006; Larkin & Finger, 2010; Latheef & Romeo, 2010; Lloyd & Cronin, 2002; Zevenbergen & Lerman, 2007).

Methodology

It is suggested above that university environments (including online environments) are complex, historic entities with inherent contradictions and tensions which, if resolved, result in the growth and development of these environments. Given this, an approach to enquiry is required which captures both the subjective qualities that comprise individual consciousness, interest and motivations as well as the contributions of the physical and social
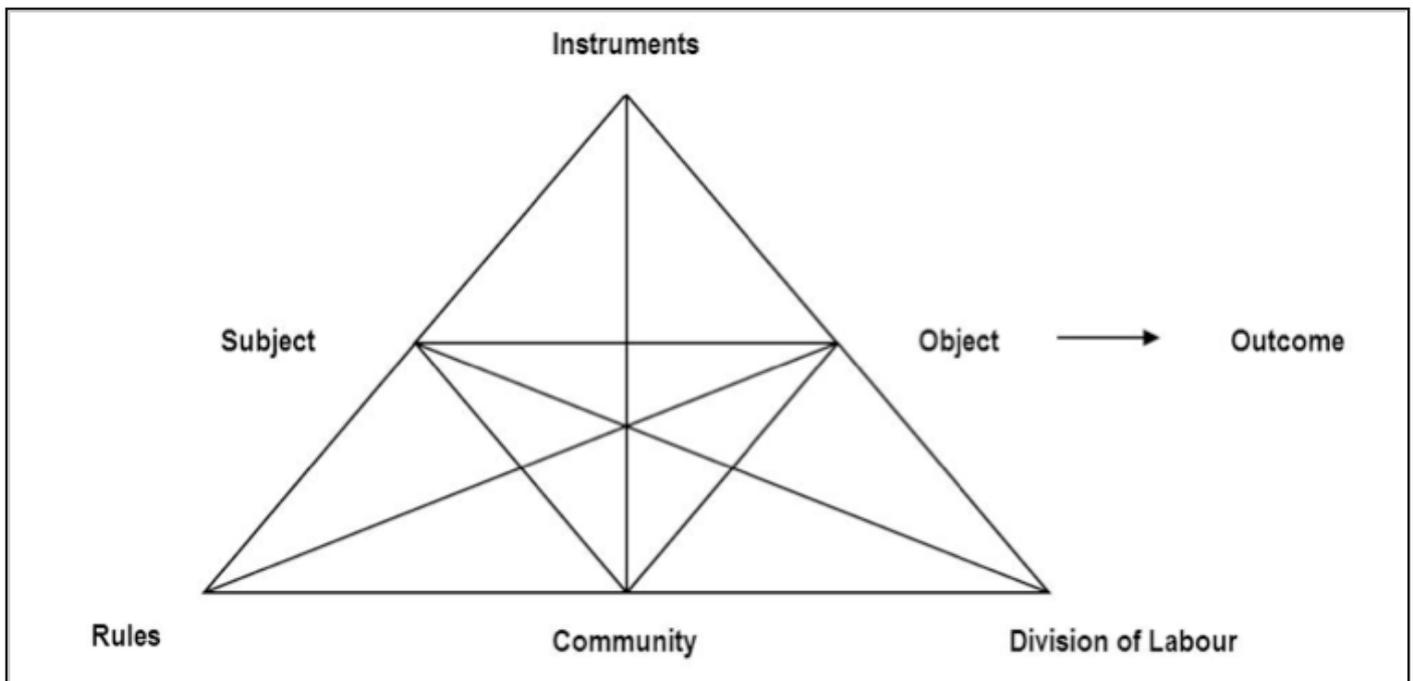
Figure 1: *Activity Systems (Engeström, 1987)*

world (Creswell, Shope, Clark, & Green, 2006; Maxwell, 2004). Consequently, a 'mixed methods' research approach (Burke & Onwuegbuzie, 2004) is used to direct the investigation of iPod usage by the lecturers and students in this study.

Data will be collected in semi structured focus group interviews, weekly reflection surveys, student forums and attitudinal surveys, and via the use of data logging software pre-installed on each iPod. The participants in the study are 40 undergraduate Nursing and Education students at each of the two universities. Each of the participants received an information package outlining what was expected of them as participants. The study has ethical clearance and pseudonyms will be used for all participants.

Progress to date

Two iterative trials of the iPods will be conducted, one in Semester 3, 2011, and one in Semester 1, 2012, with two different student groups. Both groups will comprise 40 nursing and 40 education students who are studying by distance (online). The Semester 3, 2011, trial is currently under way at both USQ and CQU. All students have completed the initial survey that was created for this research. This survey is based on revised scales from the Technology Acceptance Model (TAM) (Davis, 1989) and the TPACK Confidence Survey (TCS) (Jamieson-Proctor, Finger & Albion, 2010). Discussion forums

have been established for each group of iPod students in each course and students have been sharing their thoughts and experiences via regular Elluminate focus group sessions and weekly structured reflection surveys. All data collection instruments have been structured to be delivered via the iPods. During the semester, student access to their online course materials will be monitored to investigate patterns of usage. In addition, upon return of the iPods at the conclusion of each semester, data in relation to which applications were used will be collected.

Results to date

There has been considerable sharing of expertise among members of the research team. The academics are learning about the capabilities of the iPods alongside their students and resolving problems collaboratively as they arise. All course content at both universities is located on Moodle course sites. A Moodle community site has been established for both researcher and student use to share documents and ideas. Many self-help sheets have been developed for students to get them started with blogging, digital story telling and document reading and sharing on the iPods. Students at both USQ and CQU are displaying mixed feelings about the potential usefulness of the iPods but generally the level of excitement about using the iPods in their course this semester is palpable, as demonstrated by the following discussion forum post:

Hey everyone

I got the iPod touch going and have got all the apps and a couple of others I will share once I check them out. Anyway I used cellspin and posted a quick little text blog AND IT WORKED!!!!! I'm so happy. Next time I will try a pic or vid and see how it goes. I am loving this iPod, having so much fun!!! Anyway check it out if you want at…

Hope to hear from someone soon.
[CQU Student, 1 Nov. 2011]

The research team is heartened by the response to date from students who volunteered for the project and who at this early stage appear to value the additional mobile access provided to them to support their learning.

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