Can we really learn from mobile handheld devices?

Theme: Social Justice
Sub-theme: Scaling up Quality Education for all

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ABSTRACT

There is much evidence that mobile technologies are playing an increasing role in education. For the most part, this role has been limited to administrative reminders and some elements of learner support particularly in relation to increasing access. It is clear that mobile technologies and especially 3rd Generation mobile phones will become ubiquitous as they become cheaper and connection charges reduce.

The paper will note that the use of mobile technologies is increasing in the developed world in a number of areas, for instance in context related education, and also illustrate how hand-held devices can be used for basic language, skills, numeracy and health and safety training and some aspects of teaching and learning across the developing and developed world.

But how far can mobile technologies replace existing distance education media in the successful support of student learning and academic teaching? And how far does this depend on the affordances provided by particular hand-held devices and so exclude many who can afford only basic mobiles?

This paper will examine some of the core issues that this raises:

- The potential of mobile technologies to extend access has been demonstrated; how can this be mainstreamed and best used for learning support?
- How far can hand-held mobile devices support distance learning and teaching as it is currently practised?
- How far do mobile technologies promote new forms of learning and teaching which may supersede current practices?
- Will mobile technologies ever become a mainstream educational medium as print-based and online learning through full-size computing devices are acknowledged to be today?

The paper concludes with a series of questions around these core issues.

1.0 INTRODUCTION

Mobile technologies have considerable potential to enhance teaching and learning across all education sectors. Their impact on student behaviour, enthusiasm, motivation and progress is well documented, for example in conventional schools in the UK (CDEC, 2009).They are also used in many institutions of higher education to provide mobile access to existing learning management systems.

This paper questions what exactly mobile technologies can support and whether and how their use can best improve, enhance and develop teaching and learning at a distance.

There is no doubt that mobile phones are a great communication device, loved by young and

old respectively. Numbers of mobile phones in use are rising exponentially. At the end of 2009, mobile cellular subscriptions were about 4.6 billion and are expected to increase to five billion in 2010 http://www.itu.int/net/pressoffice/press_releases/2010/06.aspx

The value UK citizens place on mobile telephony was shown by a 2007 study carried by the London School of Economics for the United Kingdom company Carphone Warehouse. The major findings should be treated with caution given the fact that a mobile phone company sponsored the research but nevertheless the findings are of some interest.

- One in three people would not give up their mobile phone for a million pounds or more, with women leading the way on those most likely to refuse.
- 76% of people believe it is now a social requirement to have a mobile phone.
- 85% of people think having a mobile phone is vital to maintaining their quality of life.
- One in five 16-24 year olds think having a mobile phone increases their quality of life.
- Most young adults who took part in the ethnographic experiment felt mobile phones were not just a tool, but a critical social lifeline for feeling part of a friendship group.
- Most of 16-24 year olds would rather give up alcohol, chocolate, sex, tea or coffee than live without their mobile phone for a month. (Carphone Warehouse, 2006)

Experience in the introduction of new technologies in education has shown that the accessibility of hardware and software to individuals in their communities or in their homes has been the major factor in supporting new pedagogic developments. Educational developments which use existing and ubiquitous technologies which people use in their everyday lives- e.g. radio, television, computers (for some) print and now mobile hand-held devices, are much more likely to be used and to be successful than technologies which are specifically developed for educational purposes e.g. video discs.

If this point is accepted, there is no more accessible technology today than hand-held devices and therefore it is entirely proper that distance educators should be researching how best to use such technologies to enhance teaching and learning in its broadest sense. The topicality of the subject can be illustrated by the appearance in 2010 of a major study in *IRRODL,* 2010 11 (1), pp 117-40, and themed issues on the subject in both *Open Learning,* 2010, 26 (3) and *Distance Education,* 2010.

2.0 REASONS FOR USING MOBILE TECHNOLOGIES

But can how mobile technologies best be used to enhance learning? Do they replace existing printed or audiovisual materials, complement them or make learning accessible where no other medium is possible?

The reasons for using mobile technologies can be classified as follows:

2.1 Pedagogic

There is a range of opportunities provided by mobile technologies which are not necessarily available through conventional distance teaching modes.

- Actions, words (spoken and written) can be combined to provide basic educational instruction which can be work-related or simply teaching basic languages or maths (see CTAD example below)
- Quizzes can be used to check students' understanding whether by themselves (self-assessment) or by up-loading answers to institutional systems.
- Contextual learning can be included - e.g. field trips, visits to museums and art galleries
- Learning can be structured (as it can with web based learning) to ensure full

understanding of step one before allowing the student to progress to step two.

- Podcasts can bring institutional teachers 'face-to-face' with students, but care is needed here to avoid the pitfalls of reverting to traditional and ineffective lectures. Such podcasts have the advantage of great flexibility over synchronous methods such as broadcasting, whether by conventional means or by satellite, in terms of access anywhere, anytime
- Teachers can develop their own software using authorial tools or can use ready-made software (see CTAD example below).

2.2 Practical

With the rapid growth in the use and ownership of mobile devices and the dramatic increases in functionality, many students and potential students use mobile phones in their every day lives and will expect a modern education provider to be using all the available technology.

- Many adult distance learning students have commitments at work or to families and are not able to attend tutorials at study centres. Some may not have the time or the space to settle down to hours of systematic study.
- Geographical, social and temporal isolation - lack of time is the new 'tyranny of distance' - (Blainey, G, 1975; Cairncross, F, 1997) may also prevent students from studying effectively. Mobile technology can help here, especially if the learning is presented in the form of short self-contained learning objects. Thus short bursts of learning can be undertaken in the home in gaps between looking after children, at work, on the way to work and so on.
- The mobile device, being pocket sized and battery powered provides an easily accessible source of learning, which evidence suggests is also found to be exciting and stimulating by many young people.

Valk, Rashid & Elder (2010) use these two categories to analyse six mLearning projects across Asia and in particular to discover the extent to which the use of mobile technologies improves educational outcomes in increasing access and in promoting new learning – defined as changes in the "contextualized, situated, constructive and collaborative learning" (2010 p. 135). They conclude that while there is much evidence of mobile devices having an impact on increased access, there is less evidence to support the ways in which mobile technologies support new learning. Are there other examples which provide evidence that mobile technologies do support teaching and learning?

3.0 CAN MOBILE TECHNOLOGIES SUPPORT TEACHING AND LEARNING?

It is our contention that the use of handheld technologies provides a major opportunity to enhance access to learning and will enable many institutions to develop learner and administrative support and learning opportunities in ways which will build on current methods. How far these complement or replace existing practice, and how far this depends on the affordances provided by sophisticated devices or can be extended to all users is the subject of the rest of the paper.

3.1 Access and administration

Administrative and learner support usage through sms messaging and other similar processes, is well documented. Often this is because mobile phones provide the only widely available technology: at the University of Pretoria in 2003 for example, of 1900 distance students, only 0.4% had access to email while 99% had access to mobile phones. In this context, the use of SMS for administrative support and prompts is obviously worth pursuing. In 2003 The University increased response rates for registration

for contact sessions after an SMS reminder by more than 18%: 58% registered compared with the usual rate of below 40% (Brown 2004). There is also evidence that the use of proactive learner support through telephone contact can improve student retention and learning; an early telephone call can lead to an increase of between 4-7% in end of course student retention (Gaskell and Mills 2004).

Reminders can also be useful in the context of health education. At the Mobile World Congress in Barcelona this year, ITU Secretary-General Dr Hamadoun Touré said "Even the simplest, low-end mobile phone can do so much to improve healthcare in the developing world…Good examples include sending reminder messages to patient's phones when they have a medical appointment, or need a pre-natal check-up" http://www.itu.int/net/pressoffice/press_releases/2010/06.aspx

3.2 Teaching and learning – complementing or replacing existing practices?

What is much more debatable is whether mobile technologies can be used for teaching and learning in the way online teaching is currently provided. The rest of this paper considers some of evidence that indeed these technologies can be used in the teaching and learning process.

3.2.1 Skills Education

There are some good examples of software materials which aim to support the development of new skills. These include the programmes from Tribal CTAD UK (www.ctad.co.uk) which cover such topics as Health and safety, basic number skills, literacy, English for speakers of other languages.

A detailed example
Cleaning: learn some of the communication and numeracy skills you need for a cleaning job. In this activity, a set of cleaning procedures such as brushing, mopping and wiping surfaces are illustrated with animations. Learners watch these animations and learn the correct vocabulary before proceeding to the practice activities:

e.g Practice 1
In this practice activity, learners hear an instruction from a supervisor, then choose the correct illustration. They can then check if their selection is correct, or proceed to the next question and get a final score at the end of the activity. The activity helps them to practise both vocabulary and listening to instructions.

CTAD can also provide a mobile learning creation tool "MyLearning Author" which enables the development of mlearning activities which can be run on many different types of mobile device (https://shop.tribalgroup.co.uk/M-learning/MyLearning-Author.html)

3.2.2 Complementing conventional learning

Again, there are many examples of the use of mobile technologies to complement conventional learning. In Wolverhampton UK for example, the Learning2Go scheme (http://www.learning2go.org/) provides children with a hand-held device which can be used for a range of activities – "Pre-installed educational software and familiar Microsoft applications bring subjects to life – engaging pupils and encouraging them to continue their learning while the highly portable devices mean pupils can continue to learn outside normal school hours. Enabling learners to have these devices has meant they have become much more involved

and engaged at school as well as being far more proactive about learning on their own. It's a great example of how technology and smart thinking can make a real difference to young people's education." Dr Dave Whyley of the City of Wolverhampton UK (CDEC, 2009).

The use of cell phones to enhance learning through social interaction has also been investigated by Makoe of the University of South Africa. The use of MXit (a social network tool) was found to support collaborative learning and peer support (Makoe, 2010).

3.2.3 New forms of learning?

Collaborative learning of this kind is one of the new forms of learning which mobiles can provide. Kukulska-Hulme argues that "the availability of mobile technologies means that learners can move about within a classroom or outside and still have access to digital information and means of communication with other learners, with their teachers and with the world, on their mobile phone or other mobile device. This simple fact introduces profound changes to established teaching practices that reverberate through education, initially in a low key way but building up to increasingly visible effects that cannot be ignored" (Kukulska-Hume, 2010).

What evidence is there to support this argument? As noted above, Valk, Rashid & Elder (2010) did not find convincing evidence that mobile technologies promote new learning in the projects analysed from Asia. However, in a recent study from Bangladesh, English language teachers were provided with ipods preloaded with video and audio language learning resources as a form of professional development and the changes in practice noted confirm the authors belief that mobile devices can both facilitate access to learning and improve the quality of teacher education and training (Shohel & Power, 2010).

New forms of learning include more collaborative, contextualized and situated learning. There are many reports that mobile technologies are helpful in a range of context specific situations ranging from museum visits, to field work and project work. *WildKey*, a spin-out company formed as a result of an Oxford Brookes University, UK research project provides a range of software packages for outdoor learning; for example, using *WildKey* interactive keys, young people can identify and record minibeasts, pond and rock-pool creatures, birds, and many other wildlife groups while out and about (http://www.wildknowledge.co.uk/about/)

4.0 REPLACING DISTANCE EDUCATION PRACTICE?

New forms of learning noted above largely complement and enhance current distance learning and teaching practice – they do not replace it. Indeed, Kukulska-Hulme, one of those who champions the affordances provided by mobile technologies to develop new forms of learning, argues that "a mobile device does not necessarily replace existing technologies such as desktop computers, pen paper and printed books; often it may complement them by providing something additional" (Kukulska-Hulme, 2010).

So is there evidence of entirely new ways of embedding and, in particular, mainstreaming mobile technologies as a core part of particular programmes?

Perhaps the ultimate goal of those who believe that mobile learning can be used in all kinds of formal teaching and learning is the enrolment of mobile learning students onto fee-paying accredited courses which are delivered through mobile technologies. For example, the major European Minerva report argues that the goal is that "mobile learning courseware should be presented in the curriculum of the institution with the same procedures as are applied to the presentation of face-to-face and e-learning courses" (Keegan et al, 2006).

The Minerva report also argues that “the mobile learning module or part of a module needs to be accredited in the same way as the other academic offerings of the institution. If a course is not presented as accredited in the prospectus of the institution, it remains at the level of a research project and has the fragility of project status.” (Keegan et al, 2006).

What successful evidence is there of mobile technologies being used for assessment?

An interesting example is provided by the Centre for Excellence in Teaching and Learning on Assessment and Learning in Practice Settings in the UK http://www.alps-cetl.ac.uk/ . Five higher education institutions covering16 health and social care professions used mobile technologies to enable students to upload practice comments and details to a secure eportolio and so facilitate the assessment of their placements. The full report is available at the site above. The use of mobile technologies was found to be particularly helpful because students could comment on issues as they arose, between visits or between patients, at times when they would often not have access to a secure networked computer or laptop.

Parallels with the field of distance education are relevant here. Distance education had the advantage of building on the conventional modes of assessment used such as written answers to questions set by the institution, but was able to develop further the use of intelligent computer marked assessment. This is much more suitable for assessment online and through mobile systems, for example by the use of quizzes and multiple choice questioning with intelligent feedback for summative and formative assessment purposes (Jordan, S. *Open Learning*, 2011 forthcoming).

5.0 CONCLUSION

We have found no examples of hand-held mobile technologies as the sole source of learning for accreditation. There also appears to be little evidence of their substantial use as a teaching medium in higher education as part of degree programmes.

However there is a good deal of evidence of the creative and valuable use of mobile technologies (at all levels of sophistication) to deliver administrative prompts, basic education, and collaborative and context based learning. These may be the new forms of learning that will be developing in the future.

6.0 KEY QUESTIONS

The key questions posed for discussion are:

6.1. How are mobile technologies now used in learner support and administration? How far is SMS a vital component and how successful is it in delivering outcomes?

6.2 Is learning possible though mobile devices at all educational levels? Or is it best used for basic training and information? Or for context learning; e.g. visits to museums and field work?

6.4 Can it ever be used satisfactorily for assessment and accreditation on its own?

6.5 How far does the effective use of mobile technologies depend on the affordances provided by sophisticated devices? When and how will “new forms of learning” be available for all?

6.6 Will we ever get to the stage where whole programmes of study can be undertaken through mobile devices?

6.7 Where it is the only way of accessing learning materials is it also necessary to have some learner support? How might this be provided?

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