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## Looking to the future: M-learning with the iPad

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### Abstract

Might Apple's new iPad gain unprecedented traction in education, or is just another example of the over-hyping of new devices in a time of technological determinism (Postman, 2000)? This paper explores the potential affordances and limitations of the Apple iPad in the wider context of emergent mobile learning theory, and the social and economic drivers that fuel technology development. Against the background of effective teaching and learning, the functionality offered by the iPad, and its potential uses for learning, are discussed. A critical review of the way the iPad may support learning, that draws on learning theory, contemporary articles and e-learning literature, suggests that the device may offer an exciting platform for consuming and creating content in a collaborative, interactive way. However, of greater importance is that effective, evidence-driven, innovative practices, combined with a clear-sighted assessment of the advantages and limitations of any product, should take priority over the device itself.

## Mobile devices and learning

The advent in recent years of an array of mobile technologies such as multi-media capable cellular phones, iPods and iPhones, PDAs, and portable netbook computers, has stimulated considerable interest amongst the education fraternity. This interest has revolved around the potential of mobile devices to support a liberalisation of learning, based on their ability to support individuals to connect with others to “produce, consume and store content and conversation” (Traxler, 2010, p. 3). Such potential, according to authors such as Traxler, can lead to a ‘blurring’ of the line between learning which occurs at the *expense* of real life – that is, defined within the traditional school or university environment – to that which occurs as *a part* of real life, as learners interact with information and each other using mobile devices, as part of their natural daily activity.

However, according to Hemmi, Bayne and Land (2009) education has a well-established history of taking devices not originally intended for educational purposes, and attempting to appropriate them for educational gain. Traxler (2010) describes this as education having something of a ‘parasitic’ relationship with technology, where devices originally intended for the corporate environment “continually challenge educationalists to develop educationally sound applications” (p. 4) for them. Such perspectives are also supported by earlier writers such as Todd Oppenheimer in his 2003 book, *The flickering mind: The false promise of technology and how learning can be saved*, where he laments on the failure of successive iterations of corporate and domestic technological innovation to have any significant impact on the quality of student learning, when ‘transplanted’ into the educational context. Consistent with others such as Cuban (2001) and Postman (2000), Oppenheimer attributes this failure largely to the prevailing assumption that *technology which works outside of school, will work just as well in school*, and that it is up to educational practitioners and researchers to determine ways of achieving this. Such views, however, tend to be technologically deterministic in nature, and assume that the presence of technologies will act as a catalyst for fundamental and sustained change and improvement, irrespective of the nature and

resilience of the context into which they are incorporated.

In stating this, due to their pervasiveness and centrality to life in the twenty-first century, it would be equally dangerous (and foolhardy) to ring-fence new technologies, effectively sidelining them and ignoring any potential they may have for supporting learning. Indeed, to do so would reinforce the perception already held by many younger people that their education is becoming increasingly detached and irrelevant, by failing to utilise the capabilities of technology to help them learn using other sources of information and from each other at any time, rather than simply between the hours of nine and three, while at school.

According to Traxler (2010), unlike more traditional desktop technologies, mobile technologies (m-technologies) are more difficult to ignore. He comments that using desktop technology “takes place in a bubble – in dedicated times and places where the user has his or her back on the rest of the world for a substantial and probably premeditated episode” (p. 5), whereas interaction with mobile technologies is “woven into all times and places of students’ lives” (ibid, p. 5). In many ways mobile technologies have the capacity stimulate a redefinition of what constitutes a learning ‘space’, away from the constraints of *fixed place and time*, towards a conceptualisation based on *connecting people with each other and information*, through virtual collaborative spaces and communities which are highly fluid, and not bounded by time or location.

### *M-learning – Definition and affordances*

The ability to learn within one’s own context when on the move in time and space, is arguably the central learning affordance of mobile technologies, and it is vital that this idea is captured in any definition of mobile learning, or m-learning. This paper draws on a range of literature in defining m-learning as being just-in-time, situated learning, mediated through digital technology in response to the needs of the user (Traxler, 2009; Laurillard, 2007; Peng, Su, Chou & Tasi, 2005). However, what makes m-learning

different from other forms of technology-supported learning is the way it can mediate and facilitate learning experiences (Peters, 2009). This may suggest that m-learning does not offer affordances that are specific to itself, yet, by contrast, it can be suggested that its very ubiquity and mobility make it a discrete learning form (Peng et al., 2009). In other words, the learning experiences that are affected when an individual negotiates meaning for themselves, on their own or collaboratively using their own device in a situated context, is what sets m-learning apart from e-learning.

To that end, this paper argues that mobile devices offer five distinct affordances for education:

1. **Portability:** Mobile devices offer portability in such a way as to change the pattern of learning or work activity (Laurillard, 2007; Sharples, 2007; Klopfer, Squire, Holland & Jenkins, 2002);
2. **Affordable and ubiquitous access:** Mobile devices (e.g. the 4.5 billion cellphones worldwide) put web access and ‘high-spec’ functionality in the hands of more users than any other digital technology;
3. **Situated, ‘just-in-time’ learning opportunities:** There is a social expectation that we can engage and process information whenever and wherever we want, and the development of cloud-based computing supports the way in which mobile devices can decentralise our learning experiences (Johnson, Levine, Smith & Stone, 2010; van’t Hooft, 2008). M-learning affords a process of exploring and collaborating within multiple contexts using interactive tools (Sharples, 2007);
4. **Connection and convergence:** M-learning is often concerned with enabling social interactivity and connectivity. Mobile devices connect us to other people, other devices, other networks, and other technologies (Klopfer, et al., 2002);
5. **Individualised and personalised experiences:** Mobile devices offer individuality, a “unique scaffolding that can be customised to the individual’s path of investigation” (Peters, 2009, p.117). iPhones, iPads and iTouches offer an array of applications (‘apps’) that can be easily commissioned for local use

and can be selected to meet the learning topics and themes that an individual requires.

Of course identifying and realising this potential are two totally different matters. As has been introduced earlier, many technological innovations of the past have tried and largely failed – ‘bouncing off’ an education system that seems impervious to significant and enduring change. While there is little doubt that m-technology offers considerable potential to stimulate a rethink about where, when and how learning can occur, it remains to be seen as to whether or not it is able to make any sort of a dent where many others before it have failed. This paper explores the potential affordances and limitations of a new ‘m-kid on the block’, Apple’s new iPad, within the wider context of mobile learning theory and the social drivers that fuel technology development. A central assertion is the importance of seeing beyond the hype surrounding a device, so as to inquire into how effective it might be in terms of promoting long-term, deep learning (Sharples, Sánchez, Milrad & Vavoula, 2009).

### **The iPad (version 1.0)**

Until January 2010, mobile devices largely meant smartphones, cellphones, tablets, PDAs and laptops. Apple’s iPad is the latest technology to cause a buzz on the international technology scene because it is regarded as a new type of mobile platform that will, at least in theory, offer all the functionality and connectivity of a laptop, with the mobility of a smartphone. It is not proposed in this article to detail extensively the features and functions of the iPad (see Pratt, 2010), but instead, to evaluate its potential in relation to the five affordances for education of mobile technologies, as summarised above.

#### *Portability for learning*

The iPad’s size and weight potentially makes it ideal as a portable learning device, and will be a distinct benefit to those wanting to use a computer in a way that renders

technology ‘invisible’ within the learning experience (Learning and Skills Improvement Service, 2010). Collaboration and interaction between students should be easier with an iPad than a bulkier laptop or even a smartphone, where the small screen size can make sharing and group work difficult. Anecdotal evidence from early adopters suggests that the iPad’s shape and portability makes it feel more natural to pass around a group, and several of these devices could be used comfortably by groups of students working at tables.

Outside the classroom, the iPad’s portability should make it ideal for use in fieldwork, for transporting documents and e-books, and for recording real-time observations or accessing references on the fly (Johnson et al., 2010). In this respect, the iPad shares many of the affordances offered by smartphones, tablets and laptops, but with the level of interactivity available in such a portable device being its main point of difference. For the first time, there is a functional mobile device in which the readable touchscreen frees a learner from the constraints of a keyboard (Vollmer, 2010; Wempler, 2010), removes the interface of a mouse, takes away the size constraints of smartphones, and removes the weight issues of laptops and tablets. In other words, the iPad offers all the aforementioned portability of mobile devices, but with the increased power of a computer.

#### *Affordable, ubiquitous access to learning*

It is increasingly common that people looking for a computing platform turn to mobile devices as a first choice. In schools, this is illustrated by a movement from computer labs to laptop trolleys or pods, or sets of PDAs and other hand-held devices (Johnson et al., 2010). While it is unlikely that the iPad will gain the ubiquity of the cellphone for synchronous communications, for all other digitally-supported learning needs it may offer better educational value, principally due to its relatively low cost (from \$799 on release) in relation to its computing power.

In addition, the iPad may be a ‘tool of choice’ for learners with special educational

needs, due to its comfortable size and weight, its support for audio, and its flexibility in presenting text and images. Given that increasingly our lives are moving into flexible online spaces, and that often mobile technologies have been challenging for users with disabilities (due to the small screens, buttons and low functionality of mobile phones), the usability of the iPad may change the landscape in terms of learning for the elderly and disabled.

### *Situated learning*

While the iPad's design clearly lends itself to ubiquitous access and portability, it is the extent to which it could enhance the area of constructivist-referred learning that is more crucial for education – and possibly, the most problematic.

The iPad's interface design has been shown to afford intuitive use by even the youngest of users, and this, combined with its range of applications (including games and entertainment) will no doubt appeal to those learners who are already immersed in technology. However, the iPad also potentially holds significant implications for informal, 'found' learning (Johnson et al., 2010), and a move towards mobile computing using this device may serve to blur the distinction between formal and just-in-time learning (Sharples, 2007, p.9), in a way that may lead to greater affirmation of learners' own knowledge and conceptual frameworks. Were the iPad to be ubiquitous in education, it might serve 'as a catalyst that could facilitate movement towards constructivist practices, where teachers act primarily as coaches' (Rockman cited in Mouza, 2008, paragraph 17).

Under this scenario, social knowledge construction could be fostered through collaboration, greater student autonomy in learning could pave the way for enhanced metacognition, and authentic, complex problems could be addressed in real-time environments (Herrington, Mantei, Herrington, Olney & Ferry, 2008). While the iPad offers both utility and productivity applications (for example, weather checking and iWorks), iPad apps developers working in educational fields are most likely to leverage

more immersive applications ‘that strengthen the user’s sense of entering the world of the application. Users expect seeking and discovery to be part of the experience’ (Bohle, 2010, paragraph 6). This could lend itself to more authentic and complex problem-solving applications, ideally suited to constructivist-referred learning experiences. Additionally, e-books could move textbook study into the arena of the interactive, combining ‘the activities of acquiring, storing, reading, and annotating’ (Johnson et al., 2010, p. 6) with embedded video and gaming elements.

However, as m-learning begins to challenge the constraints of institutional pedagogy, the position and role of teachers in this process becomes increasingly important (Kress & Pachler, 2007). For iPads to be used in educationally effective ways, there needs to be strategic and coherent supports, particularly regarding “teachers’ [need for] high-quality professional development” (Mouza, 2008, paragraph 17). With many students using some form of mobile device, cellular networks are being extended and an increasing number of educational staff are experimenting with the possibilities for collaboration and communication offered by mobile computing (Johnson et al., 2010). However, it cannot be assumed that teachers will automatically be able to use these devices...

...in pedagogically innovative and appropriate ways. While there are many exemplars of prosaic uses of mobile devices for communication, few examples currently exist of how they might be used as cognitive tools to solve complex problems, and to engage students in authentic and meaningful tasks. (Herrington, Mantei, Herrington, Olney & Ferry, 2008, p. 1)

The construction and use of different remote environments requires skills and knowledge of the pedagogical and technical affordances of the iPad (Laurillard, 2007), including the way it connects with other devices and how this connectivity can be translated into high-quality, collaborative learning opportunities. However, mobile devices are not commonly associated with more sustained, deep and formalised learning experiences; instead, device interfaces are designed to be “intuitive enough for high-



speed, short-term interaction” (Hummel & Hlavacs cited in Peng et al., 2009, p.174). Therefore, it is not yet known how easily more sustained and deeper interaction will be possible on an iPad, although its size might be more conducive to this than a cellphone.

Another complication is the shift in paradigms for teachers, from the seemingly stable environment of the classroom or lecture hall, to more fluid environments in which the challenge is to create enough stability to allow learning to be guided (Sharples, 2007). What is seen to be of value educationally may shift too, from the show-and-tell exchange to, potentially, the “systematic capture [of] experience of learning outside the classroom, through images, notes and audio recordings” (Sharples, 2007, p.8). Additionally, learners may increasingly prefer to learn in unconventional ways where traditional assessment methods may not necessarily apply, or be suited. Taylor (2006, cited in Sharples, 2007)) observes that in these situations the context of learning can vary greatly, because:

...the mobile environment is eminently suited to supporting learning outside the context of curricula, institutions and timetables. Our potential subjects of study may be wandering around studying things that interest them, at times that suit themselves, with little or no concern for consistency (p. 9)

### *Connectivity and convergence*

The concepts of connectivity and convergence can be interpreted as both the literal connection to supporting infrastructure and peripherals, and the synchronous/asynchronous virtual connection to individuals, learning communities, and environments beyond the learner.

The iPad’s applications should eventually afford a full range of asynchronous/synchronous communications (with peripherals attached) that will allow students to create, share and connect with others in authentic learning situations, and to participate in online learning communities. However, such ubiquity of connectivity brings with it

the ever-increasing need for digital citizenship and information literacy skills, in order to navigate the challenges of what will become a much more accessible online environment. The *2010 Horizon Report* noted that, with mobile computing on the near horizon, “sense-making and the ability to assess the credibility of information are paramount ... digital media literacy continues its rise in importance as a key skill in every discipline and profession” (Johnson et al., 2010, p. 4). Some of the knowledge that students will need to construct will be how to make sense of the distributed and fluid world (Pachler, 2009). The challenge for educators will be to open security doors sufficiently to allow access to the full resources of the web, while at the same time, guiding, teaching and managing the challenges that more open and unfettered connection can bring.

Additionally, while wifi access, bluetooth connectivity and the single dock of the iPad do allow the learner to connect to a range of networks and other devices, in terms of staying connected, any educational institution, or indeed any individual, wishing to support their use must support the financial costs and technical requirements of maintaining the devices, and sustaining broadband and wifi access. Effective mobile learning environments need “strong institutional support, including the design of relevant resources in mobile format ... and technical support” (Sharples, 2007, p. 8).

Finally, in considering this device, one must also be cognisant that to work in a connected way in an online space on an iPad, is to work in the cloud-based, synced work of Apple. While cloud-based computing offers flexibility and seamless data access through multiple devices, it is also increasingly presenting ethical and moral issues in terms of data ownership, private security, digital footprints and conglomerate monopolies. The aforementioned ‘walled garden of Apple’ may indeed open up a wealth of cloud-based applications, but these must pass through the ‘Apple garden’s gate’, can be used to gather our personal data, allow Apple to engage in price-setting around the very e-books that promise so much to education (Halpern, 2010), and limit access to educational sites powered by what Apple alone judges to be ‘undesirable code’.

*Individualising and personalising learning*

With its single user logon and personalised choice of applications, the iPad is really designed as a device for the individual user, even if it can be passed around and used in more collaborative settings. In terms of less formal, individualised learning, the iPad's design and access to a huge array of applications offers considerable potential. However, realising this potential is premised on the view of *the individual as learner*, and to this end, the iPad presents some exciting opportunities. With an iPad, m-learning is possible everywhere and anywhere, dependent only on battery life and wifi access. An individual can tailor their applications to suit their specific goals and purposes, in the same way that a teacher could do to meet the learning needs of a student. Applications are already being developed to meet particular schools' needs, such as adapting textbooks to better meet course learning goals<sup>1</sup>, while the range of available communications tools allows multiple channels of engagement with a learning experience – for example, one student might be tagging and annotating their photo evidence gathered for a project on Flickr, while another might be writing a synthesis of this evidence on their class blog.

However, while the iPad presents many opportunities, there are also issues in terms of the focus on individualisation. For applications to be effective as part of an individual's learning pathway they must be pedagogically sound in their design, and foster interaction that is grounded in (still developing) m-Learning theory, rather than focusing solely on content, engagement, or 'edutainment'. Interestingly, because the iPad (like the iPhone) has no physical elements cueing the user to their use, application developers need to “craft interface elements that communicate their use obviously to the user, [the design of which] will be heavily reliant on a thorough understanding of how the user is moving through the task on the machine” (Davis, 2010, paragraph 5). How well application developers understand this in relation to education and particularly learning and pedagogy remains to be seen, but this does present a challenge for the educator who

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<sup>1</sup> Harvard Medical School, discussed in the Horizon Report, 2010

wants to identify and use applications that effectively support learning.

Secondly, the teacher and student must work together to ensure that individualised learning pathways are based on actual student needs. Evidence-driven decision-making is key here, together with an understanding of how certain affordances can be operationalised to meet these needs. In a classroom situation, the single user logon might present difficulties for collaboration (in a school that could not provide one for each user), whereas every student using their own device might present challenges for classroom management and cybersafety. While an iPad may be chosen as an educational device, it has not been designed primarily in educational terms. While the technology may aid learning, “the way a technology is used cannot be determined until it is actually used by real people in real settings” (Sharples, 2007, p. 20). This might result in unanticipated consequences for early-adopter teachers trying to create learning experiences using this technology, and possibly requires that a more flexible, co-constructive approach to learning about how it is best used in schools.

## **Conclusion**

The iPad is emerging at a time when the use of mobile devices is commonplace, and there is no doubt that, as with previous devices such as cellphones, smartphones, laptops and tablets, it offers exciting possibilities for all those who wish to be unceasingly connected and active in the online world, for both work and pleasure. But, as with all technological developments, the education sector must keep its eyes open and assess the benefits and challenges of any innovation through the lens of what is known to be effective teaching and learning. Educators have faced this technological determinism many times in the past (Laurillard, 2007; Oppenheimer, 2003; Postman, 2000). Technological devices have not been designed to solve problems in education – a fact that even Steve Jobs of Apple acknowledges (Oppenheimer, 2003). It is therefore vital that education “holds the reins of the investigation, stating [their] requirements, and using these to evaluate each new technology” (Laurillard, 2007, p. 153).

Failure to objectively assess affordances of devices for m-learning may result in ‘force-fitting’ an educational experience to the device, or conversely, a failure to maximise the opportunities available. The use of a device is not the focus, even though we know that all students need to have access to the technologies that are part of their future world. Our focus must remain on the way m-learning can be integrated into effective, evidence-driven, innovative practices, so that the learner is empowered and enriched by the learning experience. A new mobile device might eventually be a catalyst for a sea-change in the way we perceive education, but the urgency and relevance of the learning need should always drive its use.

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