

Smart learning with mobile devices?

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Abstract—The paper outlines some issues surrounding adoption of mobile learning in an unpredictable and shifting landscape of technological change. A techno-centric focus is anathema to educators who prefer to believe that innovative pedagogy is the driving force behind educational developments. However it is possible that the proliferation of mobile technologies will have an almost irresistible impact on teaching and learning. Our focus here is on the concept of ‘smartness’ in relation to mobile devices and people. The objective is to redefine smartness in an increasingly mobile age and in relation to the tools, contextual learning opportunities, and potential sources of support that learners have at their disposal.

Index Terms—Mobile learning, mobile technologies, self-directed learning

INTRODUCTION

LEARNING with mobile devices is rapidly entering the mainstream of education (Horizon Report, 2011), but years of intensive research activity as well as innovation in classroom and out-of-classroom practices have produced such diverse conceptualizations of “mobile learning” (see, for example, Traxler, 2007) that misunderstandings as to the nature and value of this broad type of learning are likely to occur whenever the opportunity to discuss it arises. Despite education experts’ efforts to move away from techno-centric definitions of mobile learning, the current everyday visibility of cellphones, laptops and tablets puts the spotlight on the physical devices, and from an educational perspective these are easily found wanting. A simple cellphone will be judged unfavourably when compared with the sophistication of a computer. A smartphone, though more advanced, can be perceived as just another way to deliver training materials rather than to foster learning. Use of a handheld games console may be viewed as no more than an effective way to contribute to the impoverishment and trivialization of education. One opinion often heard is that the devices, though useful and aesthetically pleasing, are small, temperamental, and seem to detach users from the social environment surrounding them. As such, they appear to diminish education. So what is the real point of mobile learning? Is it helping learners become smarter? And is that what educators would like to happen?

SHIFTING PERSPECTIVE IN MOBILE LEARNING

The value of mobile learning, in its many guises, has been demonstrated in abundant ways. To name but a few examples, there is good evidence that mobile devices can support small group collaborative learning, improving on what could be achieved without these tools (e.g. Zurita & Nussbaum, 2004; Valdivia & Nussbaum, 2007). The advantages of using handheld computers for fieldwork in subjects like archaeology and environmental sciences are not in doubt (e.g. Price & Rogers, 2004). It is also accepted that mobile learning supports and extends collective knowledge building across classroom and museum settings (e.g. Pierroux, 2008). Furthermore, mobile learning shows its distinctiveness when it enables the utilization of

context-based services, as was shown already some years ago in the experience of learning in botanical gardens (e.g. Naismith et al., 2005), or in the mobile support provided to learners using Japanese polite expressions according to social distance between speaker and listener, and the situation they are in (Ogata & Yano, 2004). Augmented reality simulations have been shown to successfully combine real world challenges like disaster management with information supplied to learners at key moments on their handheld computers (e.g. Klopfer, 2008). Even from this indicative sample, we can conclude that mobile learning has demonstrated its value to teachers and learners alike. On the other hand, successes such as those are still relatively isolated cases when considered against the backdrop of contemporary teaching practice on a national or global scale. To a large extent they are the product of considerable research, design and technical expertise. This is not sustainable, and arguably, it may not be desirable.

Mobile learning has typically been designed by teams of educators, software designers, researchers, engineers and others. More recently, it has taken on the challenges of participatory collaborative design, where learners increasingly play an active role (Spikol *et al.*, 2009), filling the gap between formally designed and user-generated mobile learning (Kukulska-Hulme, Traxler & Pettit, 2007). Thus for instance young people in Finland are engaged in specifying how they would ideally wish to use mobile apps to do language homework in Swedish, which a second language in Finland (Knutsson *et al.*, 2011). This collaboration and inclusion of learners is partly possible because of learners' growing experience of informal mobile activity including learning. Their experience now extends to exploration of free and inexpensive mobile apps for activities such as sports performance monitoring, navigation, and all forms of entertainment and leisure. Through exposure to mobile apps, instant internet access, mobile ways of connecting with friends through social media, and through an assisted process of reflection, it is more likely that learners can become "active makers and shapers of their own learning" (JISC, 2009, p.51). However students do not always realise the potential of new tools (Trinder *et al.*, 2008), revealing a tension between understanding new tools and being able to use them to shape one's learning. Researchers such as Kennedy *et al.* (2008) have argued in favour of "an evidence-based understanding of students' technological experiences" (p. 109) to inform higher education policy and practice. Such an understanding is also needed to inform and enrich students' own efforts to appropriate mobile technologies for learning.

The case has already been made for research on the 'learner's perspective' on mobile learning, in the context of increasing learner autonomy, personal choice of tools and learning spaces, and decreasing institutional control (Kukulska-Hulme *et al.*, 2011). The landscape of mobile devices is rapidly changing, with some devices, such as standalone PDAs, becoming almost extinct and others (e.g. handheld GPS) now

endangered, as the functionality of these devices has been incorporated into smartphones and tablets. We are faced with the dual challenge of reconciling rapid developments in technology with the rapid yet random development of mobile literacies, skills and competencies among learners. In the race towards greater 'smartness', who is winning?

SMART LEARNERS, SMARTER DEVICES?

In a world in which cellphones have rapidly evolved from being merely 'mobile' to the more elevated status of 'smart' phone, all human users would do well to understand the implications. As phones and other portable devices gradually become more context-aware, accumulating and continually analyzing information about a person's whereabouts and interactions, the degree of smartness is increasing. Augmented reality perceived through the smartphone imbues familiar objects with additional layers of data and meanings, setting new cognitive and intellectual challenges. Sensors in the phone or embedded in a person's surroundings can deduce mental states, moods and intentions by monitoring physical symptoms, activity patterns and behaviours. Furthermore, the recent step-change in intelligent speech-based interaction, so casually introduced through the iPhone's personal assistant software Siri, suggests that users will continue to be drawn into an increasingly sophisticated web of innovations largely instigated by the spheres of commerce, design and technology.

Smartness seems to be one of the hallmarks of our times. To be smart is to be quicker and cleverer than others, the short word itself connoting efficiency and cunning rather than deliberation. A smart teacher or learner might choose to use tools that enable great work to be done with ingenuity or enjoyment, and probably less effort. However teachers and learners are always dependent on the tools functioning as intended. Not so long ago we reported that difficulties with wifi connectivity were "a major source of frustration" that threatened the goals of a project in which smartphones were the focal tool (Pettit & Kukulska-Hulme, 2008). Our provocative question, "Do smart devices make smart learners?", underpinned an exploration of learner-directed uses of mobile devices, and it remains an important question for further research. The issue of connectivity, in terms of costs, security, and privacy, as well as reliability, continues to undermine educational goals. A smart device that fails to function in a transparent way, as intended, and when needed, may be likened to a student whose erratic behaviour disrupts learning for everyone.

IS SELF-DIRECTION THE SMART WAY FORWARD?

Educators aspire to instil a degree of self-direction in their students and are gratified to see them act in self-directed ways. Self-direction is associated with highly valued traits such as initiative, curiosity, capability and self-knowledge, ever since Knowles (1980) began expounding the notion of andragogy and the

idea of learner self-determination gradually matured and garnered wider support (Hase & Kenyon, 2007). Of course it could be argued that self-direction is simply a desperate measure when the learning materials and instruction methods offered are not what learners want. The proliferation of mobile technologies certainly gives learners greater scope to determine their own learning paths and goals. For example in foreign language learning, as in many other subjects, there are countless free digital resources as well as opportunities to collaborate and learn informally with others, opening up the prospect of a learner-driven curriculum in language learning, derived from learner practices with mobile technologies and the mobile behaviours and lifestyles that are such an important part of mobile learning (Kukulska-Hulme & de los Arcos, 2011). We now recognize that learners engage in educational activities motivated by their personal needs and circumstances, including those arising from greater mobility and travel, drawing on the resources of communities of like-minded learners. In doing so, they are honing their “context-awareness”, using personal and social technologies to draw on aspects of their environment, including people who can join in with them or help, in other words approaching the environment as a dynamic learning resource (see Luckin, 2010).

As previously argued (Kukulska-Hulme, 2010), a mobile culture is one where mobility, awareness of context, and learners’ specific needs become genuinely important stimuli for adoption of mobile technologies and innovative design for learning. Educators’ expectations with regard to 21st century learners encompass competencies that can be developed through the use of mobile devices, but there is a need for explicit mapping between what is expected of learners and how mobile technology can help realize these goals. In particular, time and context dimensions need to feature both in design for learning and in future plans detailing which attributes, skills and competences should be developed in learners, when learning becomes time-sensitive and context-specific. We can anticipate that learners will use mobility and awareness of context as starting points for keeping social contact alive (who is nearby?), accessing fresh content (what resources are available here?), getting local information (what’s interesting here?) and becoming visible as creators and producers of content (what can I contribute?). In this way, they can develop essential skills and competences as 21st century learners, but most of them will need guidance in how to do it (Kukulska-Hulme, *ibid.*)

CONCLUSION

Increasingly sophisticated mobile technologies and rapidly evolving learner practices suggest that the concept of ‘smartness’ in relation to mobile devices and learners should be examined afresh, identifying areas of commonality and disjunction. If smartness is an important agreed educational goal, self-directed learning using mobile devices looks like a promising way to reach this goal.

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