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## Smart Devices or People? A Mobile Learning Quandary

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### Introduction

Learning with mobile devices is rapidly entering the mainstream of education (Johnson et al. 2011, 2014), but years of intensive research activity as well as innovation in classroom and out-of-classroom practices have produced many conceptualizations of “mobile learning” (see Traxler 2007), including some that focus strongly on the affordances of mobile technology. Despite education experts’ efforts to move away from technocentric definitions of mobile learning, the everyday visibility of cell phones, laptops, and tablets puts the spotlight on the physical devices. From an educational perspective these are easily found wanting. As a tool for learning, a simple cell phone will be judged unfavorably when compared with the sophistication of a computer. A smartphone, though more advanced, can be perceived as just another way to deliver teaching rather than to foster learning. Use of a handheld games console may be regarded as no more than an effective way to contribute to the impoverishment and trivialization of education. The devices, though useful and aesthetically pleasing, are small, temperamental, and seem to detach users from the immediate social environment surrounding them. As such, they appear to diminish education. The counterargument is that these devices are “smart” and can make learners smarter. So is mobile learning 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. Evidence has been presented that mobile devices can improve collaborative learning (Valdivia and Nussbaum 2007;

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Hsu and Ching 2013), and the advantages of using handheld computers for fieldwork in subjects such as archeology and the environmental sciences are not in doubt (Price and Rogers 2004; Whalley et al. 2011). That mobile learning supports and extends collective knowledge-building across formal and informal settings is also widely accepted (Pierroux 2008). Furthermore, mobile learning shows its distinctiveness when it takes advantage of location-based activities and services (Naismith, Sharples, and Ting 2005; Fallahkhair 2012), while augmented reality simulations have been shown to successfully combine real-world challenges such as disaster management with information supplied to learners at key moments on their handheld devices (Klopfer 2008). Even from this indicative sample, we can see that mobile learning has demonstrable value and unique features. On the other hand, successes such as these are still relatively isolated cases when considered against the backdrop of contemporary teaching practice on a national or global scale. To a large extent the successes are the product of considerable research, design, and technological expertise. This approach is not sustainable, nor is it desirable if the opportunities opened up by mobile learning are to be available to all.

Mobile learning has typically been designed by teams of researchers, educators, software designers, engineers, and others. More recently, it has taken on the challenges of participatory collaborative design, where learners play an increasingly active role (Spikol et al. 2009), thus filling the gap between formally designed and informal, user-generated mobile learning (Kukulka-Hulme, Traxler, and Pettit 2007). For instance, young people in Finland have been engaged in specifying how they would ideally wish to use mobile apps to do language homework in Swedish, a second language in Finland (Knutsson et al. 2011). This collaboration and inclusion of learners' ideas is partly possible because of learners' growing experience of informal activity on their mobiles. 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 and tools, instant Internet access, and mobile social media, learners can become "active makers and shapers of their own learning," as was proposed by Jisc (2009, p. 51). However, students do not always realize the potential of new tools (Trinder et al. 2008), revealing a tension between having access to new tools and

being able to use them to shape one's learning. Researchers such as Kennedy and colleagues have argued in favor of "an evidence-based understanding of students' technological experiences" (Kennedy et al. 2008, 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 that more research is needed 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 (Kukulka-Hulme et al. 2011). The landscape of mobile devices is rapidly changing, with some devices, such as standalone personal digital assistants (PDAs), becoming almost extinct, and others (e.g., handheld Global Positioning System devices) now endangered because the functionality of these devices has been incorporated into smartphones and tablets. We face the dual challenge of reconciling rapid developments in technology with the accelerating yet haphazard development of mobile literacies, skills, and competencies among learners.

### Smart Learners, Smarter Devices?

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. On the basis of a survey of early 21st-century educational initiatives that have sought to review the skills, knowledge, and expertise students should master to succeed in work and life (Kukulka-Hulme 2010), the "ideal learner" has been characterized as someone who is active, inquiring, analytical; an engaged citizen; equipped with research and inquiry skills; able to exercise independent critical judgment; a co-creator and producer of knowledge; able to function effectively in the real world; able to communicate and cross language boundaries or cultural boundaries; and motivated and equipped to continue learning throughout their life. Smartness has not been propounded as an explicit goal of education, though Asian countries have recently adopted the term "smart education" to describe the transformation of their educational culture into a learning environment where collaborative, creative, and critical thinking skills are fostered, at least in part, through the use of technological tools (So 2012).

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 their tools functioning as intended. Some years 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 and 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—its 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 behavior disrupts learning for everyone.

In a world in which cell phones have quickly evolved from being merely “mobile” to the more elevated status of “smart,” 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 meaning, 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 behaviors (Pavel, Callaghan, and Dey 2011). 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. As devices become smarter, their users are in danger of becoming less smart, or their agency may be at risk. Allowing intelligent devices to take over some human activities involving complex calculations, information seeking, or planning may seem logical and convenient, but we must take care that users are able to understand and question how the devices function and how they arrive at their conclusions. While many people are content to give away personal data in order to use helpful

online and mobile services, reversing such permissions to use or share personal data can be difficult or impossible.

### Is Self-Direction the Smart Way Forward?

Learner self-direction is one way to regain control over technology and its function in the learning process. Educators always aspire to instill a degree of self-direction in their students and are gratified to see them act in this way. Self-direction has been associated with highly valued traits such as initiative, curiosity, capability, and self-knowledge, and since Knowles (1980) began expounding the notion of andragogy, the idea of learner self-determination has gradually matured and garnered wider support (Hase and Kenyon 2007). 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, countless free digital resources are available, as are opportunities to collaborate informally with others, opening up the prospect of a learner-driven curriculum, derived from practices with mobile technologies and from mobile behaviors and lifestyles (Kukulska-Hulme and 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. By so doing, they are honing their “context-awareness,” using personal and social technologies to draw on aspects of their environment, including people who can join them or help; that is, they are approaching their environment as a dynamic learning resource (see Luckin 2010). In the MASELTOV project (Kukulska-Hulme et al. 2012), which is developing smartphone-based services and tools to support social inclusion of immigrants in Europe, the users will be able to explore their surroundings as learning resources—for example, by using a translation tool to interpret notices, signs, and posters that they encounter in the street and then sharing these findings with an online community of other users. The project is also providing a geosocial radar to enable users to contact volunteers who can help them when they find themselves in difficulty. The MASELTOV services and tools are designed to make users more aware of their surroundings as a potential learning environment, which can also enrich and supplement any

formal education they may be involved with at the time.

A mobile culture is one where mobility, awareness of context, and learners' specific, situated needs become genuinely important stimuli for adoption of mobile technologies and innovative design for learning (Kukulka-Hulme 2010). Educators' expectations of 21st-century learners encompass competencies that can be developed through the use of mobile devices, but what is expected of learners and how mobile technology can help realize these goals must be explicitly mapped. In particular, time and context dimensions need to feature both in design for learning and in future plans detailing which attributes, skills, and competencies should be developed in learners when learning becomes more 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 is 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 so (Kukulka-Hulme 2010).

## Conclusion

Increasingly sophisticated mobile technologies and rapidly evolving learner practices suggest that the concept of smartness in relation to mobile devices and learners needs to be examined afresh, identifying areas of commonality and disjunction. If smartness is an important—if implicit—educational goal, then self-directed learning using mobile devices looks like a promising way to attain this goal. However the majority of learners will need support in gaining a greater sense of self-direction and specific guidance to achieve this in the mobile age.

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