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Mobile Education: Foreword

During 20 years of research and development in mobile learning we have discovered much about how students learn with mobile devices in classrooms, at home, outdoors and across locations.

The early studies explored how to deliver content to mobile devices. They showed that the new handheld digital assistants and tablet computers were not simply smaller versions of desktop or laptop computers but had distinct affordances for learning. Formatting content for small screens forced educational technologists to think about how to present material for effective learning, such as presenting instructional sequences through animations and short videos. The power of mobile technology to combine media capture (taking photographs, recording audio and video) with data collection, and calculation led to outdoor activities such as field trips and multimedia trails supported by handheld devices. In classrooms, students used mobile devices to take notes, perform calculations, visualise data and respond to quiz questions.

The next stage in development of mobile learning came with a realisation that the focus should be on mobility of the learner. Within a classroom, the context of learning is tightly constrained: students sit at tables or desks, their focus is on the teacher, they follow a lesson plan. When students learn at home or outdoors, those constraints are relaxed and changed. The learner has more agency to determine when and how to learn. Students can move across settings – school, outdoors, home – and use mobile devices to continue their learning. An influential paper by Wong and Looi (2011) identified ten elements of *seamless learning*, where mobile technology can support movement from one context to another. These included learning across time, across locations, between physical and digital worlds, and among multiple devices. No longer is the mobile learner restricted to using a single handheld device – with cloud-based technology, students can access and share content on many devices from many locations.

Now, mobile learning is being reconceived as learning activities that are embedded into the daily lives of students and lifelong learners. During a typical day, a university student might wake to a radio news item about higher education policy, read a blog about new technology, catch up on coursework over breakfast, watch a recording of the previous day's lecture, attend classes and take notes, take photos of a science experiment, engage in a short course for interest, share notes with a classmate, add content to a team project, watch some YouTube videos for leisure learning – all with a personal mobile phone or tablet. The interleaving of work and leisure, mixing of

media, and movement between curriculum-led and self-motivated learning form the fabric of everyday life for many students and adult learners.

In a project to explore everyday mobile learning, we loaned mobile devices to Masters students for ten months and encouraged them to use the devices in any ways they wished to support university studies and informal learning (Corlett, Sharples, Chan & Bull, 2005). A main finding of that project was that students valued having access to course content and timetabling information, however they saw no need for a dedicated 'student learning organiser'. Instead, they preferred to integrate the institutional tools with their personal calendars, notes and social media. An implication for the future is that, to be widely adopted, mobile learning technology and content needs to be closely aligned with the tools and media that learners prefer to use in their everyday lives.

Most new learning platforms, tools and applications for education are now designed to run on mobile devices as well as laptop and desktop computers. Does that mean mobile learning has become synonymous with e-learning? Although educational technologies may be converging, the contexts and practices of mobile learning are distinctly different to classroom education. As teachers and researchers we need to understand in greater depth how students learn within and across locations, times, and social groupings with a variety of technologies. As we discover more about the practices, difficulties and opportunities of mobile learning, we can design curricula that adapt to the personal circumstances of each learner.

Two issues at the centre of this research into student-centred mobile learning are evaluation and assessment. To design more personalised opportunities for learning we must understand how students learn outside formal settings, how they make use of resources and technologies that are ready-to-hand, and how they continue their learning across multiple locations. In our joint paper on meeting the challenges in evaluating mobile learning, Giasemi Vavoula and I propose five principles to guide evaluation (Vavoula & Sharples, 2009):

1. Capture and analyse *learning in context*, with consideration of learner privacy.
2. Assess the *usability of the technology* and how it affects the learning experience.
3. Look beyond measurable cognitive gains to changes in the learning *processes and practices*.
4. Consider *organisational issues* in the adoption of mobile learning practice.
5. Span the *lifecycle* of the mobile learning innovation that is evaluated, from conception to full deployment and beyond.

The second important issue in mobile learning research, especially for students in higher education, is how to assess learning with mobile technologies. Some methods of assessment that are effective in formal settings, such as exams and written assignments, are inappropriate for mobile devices. Conversely, other assessment methods such as learning logs and reflective diaries are well suited to mobile devices that can capture learning as it happens, record video and audio, analyse data, and perform on-the-spot calculations. A challenge is to integrate these learner-initiated forms of assessment into a programme of study, such that they clearly demonstrate learning processes and outcomes without needing excessive time to interpret and mark.

Now that students routinely access course materials on mobile devices and study across multiple locations, it is essential that some students should not be a disadvantage because of lack of mobility, poor eyesight, or ability to manipulate small devices. More research is needed not only to compare learning outcomes with handheld and desktop devices, but also to investigate learning possibilities across different devices and settings. The research methods followed in this book – analysing mobile learning from the perspective of students and lecturers through a questionnaire followed by structured interviews, then more detailed investigation of students taking a short course, comparing studying with fixed and mobile computers – are excellent ways to uncover the patterns of learning and find opportunities for assessment with mobile devices.

Personal mobile devices make possible new forms of learning – such as augmented reality – and an expanded range of assessment tools, such as multimedia logs and diaries. Teachers, policy makers and technology developers need to know how students with differing abilities, self-efficacy and experience are advantaged or disadvantaged by mobile technology and how all students can benefit from the expanded range of opportunities that mobile learning affords.

References

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