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Mobile 2.0: crossing the border into formal learning?

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Web 2.0–Based E–Learning:
Applying Social Informatics for Tertiary Teaching

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Chapter 10
Mobile 2.0:
Crossing the Border into Formal Learning?

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ABSTRACT

Many practitioners are looking for ways to bring the vitality of Mobile 2.0—for example, social networking via a mobile phone (cellphone), or photo sharing on a mobile blog—into formal learning and teaching. But they face a complex and even paradoxical challenge: how can they harness that vitality without stifling its most distinctive feature—the fact that it is user led? This chapter begins with an analysis of that paradox as a foundation for understanding the challenges that practitioners face now and in the future. Drawing on data from interviews with six experienced tertiary practitioners, the authors describe and analyze a number of examples that point to the particular power of mobile devices to blur formal and informal activity in people's lives. The aim is to look beyond the hype around innovations in mobile devices and connectivity to focus on the opportunities for practitioners to bend the arc of Mobile 2.0 to the needs of their learners.

INTRODUCTION

The border referred to in the chapter title has the sunny territory of Mobile 2.0 on one side of it. That is where people update their online status while sitting at a café, upload their photos on Flickr while walking by the river, and access Wikipedia from the train. It is where personal interest and enjoyment fuel billions of interactions. It is Web 2.0 on sleek mobile devices.

On the other side of the border lies the territory of formal learning. At the moment it is not so sunny. Indeed many of its long-term inhabitants—practitioners in colleges and universities—look across the border and wonder whether they can bring some of that energy and vitality over to their side and into formal education. It may not be easy: a 2008 report commissioned by the Joint Information Systems Committee (JISC), based on data from more than 1,000 first-year university students in the UK, found that the rationale for "using social networking sites for *formal teach-*

ing purposes" (Ipsos MORI, 2008, p. 7, emphasis added) was less obvious to these students than was the case with many other information and communications technology (ICT) services. This was despite the fact (or perhaps because of the fact) that over two-thirds of the respondents, who were nearly all aged 18 or 19, used social networking sites "regularly" for their own purposes (Ipsos MORI, 2008, p. 14).

The two opening paragraphs above reveal the dilemma for tertiary practitioners: how can they mobilize the benefits of Web 2.0 and Mobile 2.0 for their teaching without destroying what is most distinctive and interesting about Web 2.0/Mobile 2.0, that is, the fact that it is driven by users? To quote the JISC report again, "Use of social networks … does not feel right when led by the teacher" (Ipsos MORI, 2008, p. 36). That position—even though the authors of the report raise the possibility that it may be more applicable to first-year students than to more advanced students—provides a considerable challenge for practitioners.

Helping to meet such challenges is the key purpose in this chapter, which draws on a wide range of literature to provide pointers and examples, and looks at some of the possible futures for Mobile 2.0. The chapter draws on the authors' own research into practitioners' use of mobile devices to suggest that it is the blending of the personal and the formal—as much as concerns about the distinction between "1.0" and "2.0"—that may hold the key to resolving the dilemma set out above.

OWNERSHIP IN TERTIARY EDUCATION

The metaphor of the two territories with which the chapter opened is, of course, an over-simplification. The differences are not so stark or the border so clear, and this chapter seeks to explore a more nuanced understanding of how Mobile 2.0 can enrich formal learning. Nevertheless, there is

a sense that tertiary education has been seriously challenged by the phenomenon of Web 2.0/Mobile 2.0, where users generate and share content and have considerable ownership.

This has happened at a time when mobile devices—whether handhelds, or portables such as laptops—have arrived on campus largely on the learners' own terms. These devices support what one report, based on a study in 2006 of over 400 "technology-savvy" UK students, described as an "underworld of communication and information-sharing invisible to tutors" (Conole & Creanor, 2007, p. 11). The use of "underworld" here is not so much sinister as making the point that these students, who indicate one likely future for tertiary education, use their own devices in their own ways to support their learning.

These trends resonate with Downes' (2006) challenge that "the students own education." How to meet that challenge, or variants of it, is one of the issues at the heart of this book in general, and the present chapter in particular. For many professionals in teaching and learning it is a pressing concern. How, for example, might they harness the power of photo sharing, one of the most vibrant of the participatory practices that can be found within Mobile 2.0? Could they use it in a teaching program on the built environment or ecology, for instance, where students would use their mobile phones (cellphones) to upload images of a building they have just walked past, or of a plant they have found in a meadow? Later in the chapter, some of the issues involved in doing this are considered.

CO-EXISTING PARADIGMS

It is also worth noting how far Web 2.0 and Mobile 2.0 co-exist with earlier but not necessarily inferior paradigms of social and educational communication. A practice with "2.0" in its name seems to assert that it is an evolutionary improvement on its predecessor. However, there is still much to be said

about earlier mobile practices such as short message service (SMS) text messaging. SMS is often a straightforward one-to-one communication, and is not one of those services such as Wikipedia or many of the Google applications that harnesses "collective intelligence" (one of the criteria used by Tim O'Reilly when defining Web 2.0, quoted in Linden, 2006). Nevertheless, SMS has extensive application in collaborative mobile learning, and it throws light on the way mobile practices enable learners to cross the border between personal interest and formal learning. Such crossings are crucial if the potential of Mobile 2.0 and Web 2.0 is to be fully realized.

In the present chapter's authors' earlier research with mid-career professionals in education, an interviewee—a teacher of Spanish—illustrated how the crossing might be done. The teacher had asked students to send SMS messages in Spanish as homework while visiting Spain. The teacher reported that students added personal messages asking about the weather and food, and concluded that some "believed it was a personal thing, not homework—somehow they do not link the idea of mobiles with classwork" (reported in Pettit & Kukulska-Hulme, 2007, p. 26).

That merging of formal activity and the "personal thing" also aligns closely with one of the main findings from the interviews carried out by the authors with six practitioners in tertiary education. All of them were experienced users of mobile devices, and several of them were engaged in Mobile 2.0 practices. In addition to commenting on the potential of mobile devices for tertiary education, they spoke about the position of these devices in their professional and personal lives. As reported below, for several interviewees that professional/personal distinction was extremely blurred, even invisible. For one interviewee, the combination of Facebook and mobile phone was important. For another, it was the humblest of mobile devices—the memory stick—that allowed a certain level of nomadism. For a third, it was the personal mobile phone carefully placed on the

workdesk that symbolized the dovetailing, rather than total blurring, of professional and private worlds. Even where the practices would not be defined as Mobile 2.0, there was much that was creative and may give pointers to future exploitation of mobile devices.

Overall, then, the emphasis here is on practices—Mobile 2.0, Web 2.0, and earlier practices—rather than on technological innovations. Clearly the latter are important, and reference shall be made to some of them towards the end of the chapter. But the massive publicity they often receive can obscure more important questions—more important, at least, for tertiary practitioners—about the opportunities they offer for learning. If a new paradigm is to emerge in mobile-enabled formal learning, it will ultimately depend on teachers, administrators, researchers, and learners. As Kling (1999) emphasized in his now classic article on social informatics, "technology alone, even good technology alone, is not sufficient to create social or economic value" ("The productivity paradox," para. 10).

MOBILE TECHNOLOGIES IN DAILY LIFE

Those instances of photo sharing and SMS have similarities with the wider aspiration expressed by a number of other researchers. Naismith, Lonsdale, Vavoula, and Sharples (2006), for example, argue that "The challenge will be to discover how to use mobile technologies to transform learning into a seamless part of daily life to the point where it is not recognised as learning at all" (p. 5).

This challenge could be taken in a number of directions. One approach that has brought success is to use mobile devices to enrich participants' visits to museums or heritage sites, to city squares and river banks. As visitors move through the space, their devices present them with information relevant to where they are. Naismith, Sharples, and Ting (2005), for example, evaluated one such case

where visitors to a botanic garden used handheld computers that were GPS enabled.

In considering how that most prevalent of mobile devices, the mobile phone, might be used to enable learning, it is worth looking at trends in usage statistics. In the UK, the number of picture and video messages sent from mobile phones showed a year-on-year growth of 9% between 2008 and 2009, and on Christmas Day 2009 more than 4 million picture and video messages were sent by UK consumers (Mobile Data Association, 2009).

These figures suggest there is considerable potential for photo sharing in formal and informal learning. But as stated above, it is also important to explore the potential of "older" mobile practices. The moral basis of that aspiration is massively strengthened by the fact that mobile phones (even if with lower functionality) are also widely used in less-developed areas of the globe. Giridharadas (2010), for example, claims that innovators in developing countries are aiming to "find ever more uses for cheap, basic cellphones" (p. 4)—enabling users to hunt for work, make payments, transmit church sermons, monitor election candidates, and so on. There is, he argues, "a global flowering of innovation on the simple cellphone" (p. 4).

Mobile telephony does not need an infrastructure of cables, which for developing countries would be impossibly expensive in many rural areas, and it offers inhabitants in these countries "a way to bridge the connectivity gap without expanding the networks of fixed lines …" (United Nations Conference on Trade and Development, 2009, p. 41). The scope to use solar energy to power the base stations adds to the attraction of mobile telephony in these environments (Murray, 2008).

So far in the discussion of mobile phones in the developing world, much of the emphasis has been on their role in economic development. However, Selanikio (2008) is one of those highlighting their educational potential, given the growth in mobile phone use in sub-Saharan Africa, for example. He argues that it is more realistic to focus on mobile phones and mobile telephony than on programs aiming to provide laptops to teachers and schoolchildren. In his view, we need to reconceptualize the mobile phone network as an "international network of wirelessly-connected computers throughout the developing world" (para. 1).

DESIGNING FOR LEARNERS' AGENCY

The thread running through several of the above examples is the attempt to harness activities—some "2.0," some not—that people are already doing for themselves. This is not always as straightforward as it was for the teacher of Spanish alluded to earlier. Thornton and Houser (2005), for example, sent short "mini-lessons" of English language material to 44 Japanese students on their mobile phones. These chunks of material were sent during the day at 9:00 am, 12:30 pm, and 5:00 pm, the intention being that students would learn more if they studied at intervals. Thornton and Houser reported considerable success but noted that over half the students did not engage in this "carefully timed interval study" (p. 222); many of them saved all the chunks for when they were traveling home, since that was the time of day that worked with the grain of their lives. It suited them personally, and it overrode the carefully paced delivery that the educators had designed.

It was reports such as this, combined with the findings of their own research, that led the authors of the present chapter to use "Going with the grain" as the title for their aforementioned 2007 publication (Pettit & Kukulska-Hulme, 2007). It is not necessarily the case that educators should invariably work within the limits of their learners' practices. However, it is arguable that lack of fit between the grain of learners' practices on the one hand, and educators' intentions on the other, is one reason why it may be difficult to design mobile-enabled learning for a group—even when the individuals in that group are very resourceful users of their own mobile devices for their own purposes.

This may be particularly true where educators are attempting to harness Mobile 2.0 activities—where, in the terms of this chapter, they are reaching across the "border." At the heart of this attempt is the question of ownership of these activities:

Outside the boundaries of formal education, there are a number of user-generated activities where mobile devices seem particularly well suited, and where users pull many of the levers themselves; for example, digital storytelling, citizen journalism, blogging, photo sharing and cultural citizenship. (Kukulska-Hulme, Traxler, & Pettit, 2007, p. 58)

The point has similarities with the argument in a wide-ranging paper from Jacobs and Polson (2006). They argue that when educators try to design learning experiences that draw on Web 2.0 practices, they need to give more weight to the "social incentives for participation" (p. 4) and less to entertainment. Like a number of others, the authors also stress the need for learners to retain a sense of ownership of the activity: "The growth of Web 2.0 services such as MySpace, Flickr and user-led information platforms collectively demonstrate a desire among users to have agency over their engagement with ideas" (p. 10). This emphasis on ownership and agency is a clear theme in current discussions about the way educators could harness Mobile 2.0. It also aligns with the point from Heppell (2006), who argues that with the advent of Web 2.0, teachers and administrators need to recognize that there has been a shift of power away from institutions and towards learners.

WHAT DO OUR LEARNERS ACTUALLY DO?

Many in tertiary education acknowledge this argument about the shift of power (even if they are not always certain how to respond). At times, however, this acknowledgment becomes a "homage to the generations"—the "iPod Generation," the "Net Generation," "Gen Y," the "Millennial Generation," the "Google Generation," and so on. It is worth digging below the surface of these claims, not to suggest that there are no inter-generational differences but to learn more about the detail and diversity of students' practices (see also Chapter 16 in this book).

For example, in their study of first-year students' use of ICTs (including mobile devices) at five English universities, Jones, Ramanau, Cross, and Healing (2010) found "a complex picture," and argue that it is "simplistic to describe young first-year students born after 1983 as a single generation" (p. 722). In an earlier study of first-year students at three Australian universities, Kennedy et al. (2007) concluded that students classed as belonging to the Net Generation were not using Web 2.0 technologies to a major extent. The study found that, for example, relatively few students in 2006 were familiar with blogging: 55% had never read a blog, and 73% had not created their own. Kennedy et al. contrast these findings with the assumptions and generalizations that some commentators have made about this generation's appetite for blogging, and warn that "there is a real danger that such commentary will create a vague but pervasive feeling among tertiary educators that every student who enters the higher education system is a blogger" (p. 522).

Kennedy et al. (2007) discuss a number of explanations for the "clear disparity between the proposed and actual technology use of the Net Generation, particularly in the area of Web 2.0" (p. 523). One reason could be that the claims about the Net Generation are derived largely from research in North America; it is possible that "Australian students are not as enamoured with Web 2.0 technologies as American students" (Kennedy et al., p. 523). The authors also tentatively suggest that future intakes of tertiary learners in Australia may be bigger users of Web 2.0.

WEB 2.0 AND MOBILE 2.0: DESIGNING FOR LEARNING

Broadly put, the picture (as presented, for example, by Conole & Creanor, 2007) is one in which many students are adept at using their own mobile devices within tertiary education for seeking information on the Internet, for communicating with other students, for writing assignments, and for storing and transporting electronic media files and documents. A considerable number also participate personally in Web 2.0/Mobile 2.0 activities, although as seen in Jones et al. (2010) and Kennedy et al. (2007), cited above, a single generation is likely to be less homogeneous than some commentators have claimed.

For practitioners, though, there is still much work to be done in realizing the potential of Web 2.0 and Mobile 2.0 for learning. An Open University project in the area of citizen science illustrates one way of doing this. At the Evolution MegaLab (http://www.evolutionmegalab.org/), volunteers from a number of European countries are gathering data related to global warming and evolution. Their task is to search for two common species of land snail, and to report the locations of the snails and the colors and patterns on their shells. Historical records show that there is a tendency for snails in the cooler north of Europe to have darker-colored shells than snails in the south. One aim of the project is to find out whether, with global warming, there is now a higher incidence of lighter-shelled snails in the north.

Variations in the color and patterning (including the number of bands) are also related to differences in the type of predator that the snails need to protect themselves against. As the level of danger changes—for example, if the number of snail-eating birds declines—the camouflage may also change across generations of snails. Another aim of the project, therefore, is to determine whether the camouflage has evolved over time.

When participants upload their report on the Internet, the data "will be automatically compared with historical records from nearby locations, and participants will receive instant feedback on any evolutionary change that may have taken place" (Silvertown, 2008, "Results/Conclusions," para. 1). One longer-term aspiration of a related Open University site, iSpot (http://ispot.org.uk/), is that participants should be able to upload their data using their mobile phones wherever they find any living thing they wish to identify, thus reaping the benefits of using an everyday handheld device.

Participants in Evolution MegaLab can see, in the form of the zoomable map, their own contribution and the collective effort of everyone who has participated thus far. In this way, they are actively taking part in research on the major topics of global warming and evolution, and for some participants this may provide a pathway into formal tertiary study in the biological sciences. This pathway would imply a merging, or at least an overlapping, of informal and formal learning.

The issue of borders and merging is one that was explored in some depth in interviews conducted by the authors of the present chapter with six experienced practitioners at The Open University. This forms the topic of the next section. As will become clear from the accounts below, the blurring of professional concerns and personal interest is one of the strongest themes to emerge, and one where mobile devices and Web 2.0/Mobile 2.0 play a distinctive role.

EXPERIENCED PRACTITIONERS' MOBILE PRACTICES

The six interviewees, three male and three female, were all practitioners in the broad field of digital learning at The Open University. Some were directly involved in writing teaching material, and most were involved in research or projects related to teaching and learning. Their particular interests included mobile-enabled learning, the design of teaching material for small-screen devices, open educational resources, and text-to-audio conver-

sion for learning, among others. The interviews, each of which lasted approximately one hour, were semi-structured and were carried out by the authors in 2007–8. They were conducted face to face, except for one interview that was partially conducted by email. Five of the interviews were audio recorded, and were carried out on the basis that any quotations would be anonymous; the remaining interview was recorded in note form. Interviewees were asked in some depth about a number of issues, and specifically about:

- their use of Mobile 2.0 and Web 2.0 services;
- their use of mobile devices in their professional and their personal lives;
- the boundary (if any) between these spheres, and the way they managed the boundary;
- how, if at all, their use of mobile devices had changed their conceptions of "learning" and "teaching."

For some interviewees, mobile devices supported leisure interests and were in themselves a kind of hobby. The interviews also convey a picture of diversity and highly particular arrangements. Decisions as to what device to use in which location, and for which purpose, were very individualized. At the same time, for any individual there was often device overlap. If for some reason a device did not work, another could often be substituted because most of the interviewees were "device rich," that is, they owned or had access to several devices. Some of these were their own devices; in many cases, interviewees interwove these with the devices provided to them by their employer.

In the article quoted earlier on social informatics, Kling (1999) makes the telling point that "The design and configuration of information systems that work well for people and help support their work, rather than make it more complicated, is a subtle craft" ("Punditry about information technologies and social change," para. 4). It is difficult

to see how an institution could design systems down to the level of particularity revealed in the interviews. Rather, the evidence suggests that the interviewees made their own adjustments. They themselves exercised the "subtle craft" within a reasonably flexible institutional framework. Where there was a gap between that framework and their own requirements and preferences, individuals often filled it by buying a device and using it for both professional and personal purposes. This is akin to the practice among many students in the UK (Conole & Creanor, 2007) referred to above: many of them used their own devices within the framework of formal learning provided by the university or college.

Mobile 2.0 and Web 2.0

One interviewee used Flickr when traveling, uploading photographs from a mobile phone and making them available to friends and family. Facebook was increasingly important for this person: *"Now I'm more likely to use Facebook a lot [from the mobile phone] ... If I'm away from home, two or three times a day."* Facebook also plays a role in work: *"Even within the group where I work, we tend to update status at different times [of the day] just to know what other people are doing."* Flickr was used by another interviewee for sharing holiday photos as well as for photo sharing among those attending an academic conference, while yet another preferred to share photos through Facebook. The reasons for choosing a particular service were typically described in terms of convenience and the peer/friendship groups that interviewees were part of, which prompted the selection of one service over another.

OpenLearn (http://openlearn.open.ac.uk/), an Open University site giving free access to learning materials and tools for collaboration, was mentioned as a platform that appears to blur boundaries between formal and informal learning whereas in reality, argued the interviewee, the boundaries may be *"more jagged than blurred"*:

there are social tools on the site that can support informal collaborative learning, but they are not used a great deal. This interviewee maintained that when learners made use of the site as a group, led by a champion who was keen to help them, it seemed they were more likely to benefit from its tools and resources. This highlighted the issue of status or expertise, which might influence participation. Another interviewee stated that device-specific websites, on which users share knowledge about how to get the best out of a particular mobile device, exemplify some of the potential of Web 2.0 and Mobile 2.0.

The social bookmarking service delicious, accessible from anywhere, was a very important Web 2.0 tool for another of the interviewees. He described how his hobby of writing and producing electronic music has gradually merged in with work activity:

I use delicious a lot to keep track, I've got categories of stuff ... for music and for work. I search my delicious bookmarks before searching generally ... I use it all the time, at work and at home ... I did think about having two logins, but that would be more trouble than it was worth.

Some items are *"obviously work,"* some are *"home stuff,"* and some are *"difficult to categorize."* For example, his projects on computer-generated sound are hard to distinguish from his work on the use of audio for learning:

There are some things that are to do with processing, capturing of audio which I may do at home ... that are also relevant to work. Speech synthesizers are something I've been looking at to use in my music, and that's a key feature of turning structured authored texts into talking books and podcasts automatically ... to get everything pronounced correctly.

When interviewees talked about their use of Web 2.0 and Mobile 2.0 services, work and leisure were often mentioned in one breath or without making a clear distinction—a point elaborated on in the next section.

Blurring between the Professional and the Personal

This was perhaps the biggest theme to emerge from the interviews. As one interviewee said,

It's difficult to tell sometimes whether it's work or not ... For me there is no boundary ... I don't know whether I've acquired friends who do what I do, or whether what I do has made me friends ... But the people I write with and teach with are as much friends as colleagues.

This theme of contact with others was particularly important for her: *"wherever you are, and whoever it is, you are assuming they have a mobile phone and you are in text [SMS] contact pretty much when you want to be."* This interviewee also stressed the geographical blurring, through working overseas:

Sometimes I can't tell you whether I was here or there [in the UK or overseas] ... It isn't really significant where I was. The fact is that decisions were made, discussions were had, and things were written ... I can barely remember [where].

One of the other interviewees conceptualized the boundary differently: *"the relevant boundary, I would say, is not so much between personal and professional as between different kinds of work."* In an email interview, he explained this in terms of the differences between devices:

I would only use a mobile device for email and maybe editing or note taking (maybe in a library). I couldn't contemplate sustained writing at a mobile device (except maybe a biggish laptop).

For a third interviewee, a single device—a smartphone, for example—might be used for both work and personal interest. The spheres were not clearly separated: *"If I'm thinking about something [to do with] work, that's the thing that's on my mind. So whether I'm at home or at work doesn't really matter too much."* He used the smartphone to capture ideas (about work or personal interest) wherever he was: *"The same device is often being used for both ... It's the fact of having the device there, to record, before you forget them."* He reported being out with friends when *"something occurred to me."* He took out the smartphone and typed in a couple of lines. His friends appeared not to mind this:

People are quite comfortable now with being interrupted by a device ... whether you're sending a text or typing a couple of things ... People are used to me taking notes.

This may appear to illustrate almost complete blurring between personal and professional interests, to the point where they are one and the same thing. While this may be the case for some of our interviewees, this interviewee nevertheless reported using a mobile phone to maintain some boundary at work—placing the phone on the workdesk. He continued,

I don't have to give my work telephone number to [friends and family] because they can reach me on my mobile. I have a personal email and a work email, which I keep distinct as well.

He also reported having two laptops, one of his own and one that was supplied by the employer: he brought the personal laptop into work, and took home the *"work laptop,"* but some distinctions remained: *"My personal laptop comes into work, and vice versa. But they still have a certain degree of autonomy."* This suggests quite subtle use of devices, and near—but not complete—blurring of the boundary.

One interviewee remarked that she no longer shuts the door of her home study as a way of stopping work. The pervasiveness of computers, and being able to work while lounging on the sofa with a laptop, meant that the working day was being stretched, whereas clear boundaries had existed previously.

Perceptions of Learning

How have mobile devices changed perceptions of learning? According to one interviewee,

It was almost immediately accepted that desktop computers were a tool that could be used for learning because they were designed and sold to businesses originally ... So then the move into learning support was kind of smooth, because a lot of education is to get people to move into the workplace. So there is a kind of underlying smoothness of transition there, whereas mobile devices have been consumer devices, and bringing those into use in the classroom seems to be counterintuitive for some practitioners. Not all, but for some. But I see that lessening as the devices become more universal.

An activity like geocaching, popular with another interviewee, could accommodate various types of activity, from playful leisure through to learning:

I go geocaching ... I was on the top of Bodmin Moor, and I got my phone out and went onto the website to read the directions and get the location of the next cache ... People hide and seek caches, and you use GPS coordinates to identify where you've hidden a cache ... it's a hide-and-seek, it's a treasure hunt.

This interviewee mentioned that there are also more overtly educational geocache pursuits, for example, geological geocaches.

Futures for Mobile Learning—
Their Own and Others'

Two of the interviewees particularly valued the fact that mobile devices (in one case, a laptop rather than a handheld) enabled them to capture ideas as they came to mind. For example:

I like the idea of having a portable computer with me all the time because ideas are apt to strike me at any time, and I like the idea of being able to capture them on the hoof. I also like the idea of being able to access the Internet on the move. We don't teach students ... specifically about working in this way themselves, although several of our courses now teach something about the technologies that make it possible, such as Wi-Fi, 3G, WiMAX, data transmission, compression, and storage.

This interviewee also saw a role for mobile devices in enabling students to gather material in the early stages of a writing assignment:

They could "research" [the topic] on the train on a portable device, just Googling away, and making clippings of everything that seems relevant, for closer study later ... That's certainly how some of us work on ideas for [writing our teaching material].

Another interviewee spoke of the benefits of using a smartphone for capturing ideas:

When I'm thinking about various things at work ... the ability to have a jotter pad to capture ideas, because I might not necessarily be at my desk ... might be traveling, might be sitting on the sofa at home. So it's handy to have one place where you can put these things in.

He also talked about how he made brief notes about journal articles he was reading. In this case, the fact that it was difficult to input much text

was actually seen by him as an advantage in that it *"helps you crystallize your ideas."*

A number of researchers have reported the challenges and constraints of designing for the small screen (e.g., Churchill & Hedberg, 2008). One of the interviewees discussed the implications for teachers of preparing learning material for handheld devices. He argued that the constraints could be an opportunity to find new ways of presenting material: "you really do hone down what you are trying to say." He also highlighted the possibilities of using multimedia technologies such as Flash on mobile devices, for example, to create small, bite-sized chunks or pieces of learning content in physics, music, or mathematics.

As Woukeu, Millard, Tao, and Davis (2005) have pointed out, this type of learning does not necessarily represent a new paradigm in the sense of drawing on the potential of Web 2.0 and Mobile 2.0 participatory practices; it may simply be "providing existing applications on a reduced device" (p. 162). Nevertheless, along with several of the examples in this chapter, it suggests that more conventional mobile-enabled learning still has potential. It also raises the question of the actual difference between Web 2.0 and earlier models. For example, user-generated content—such as information on Wikipedia—is not necessarily pedagogically innovative, even though it may reflect the Web 2.0 practice of harnessing collective intelligence. (Similar questions are explored in a number of other chapters in this book: see, for example, Chapter 2.)

Which Mobile Devices?

The interviewees had evolved certain patterns of technology use, based on experience of what suited them best and what they saw as working to their advantage. For example, *"I only give out this number if I'm supposed to be at work but have to pick up the kids—I use it for my benefit at work"*

and *"I have quite a lot of bits of mobile technology for different purposes."* With access to multiple devices in different locations, interviewees were able to find solutions that fitted their needs exactly, such as synchronizing portable devices with computers both at home and at work, or using a large screen to give their eyes a rest. One interviewee described how she would occasionally connect her laptop at home to a 42-inch plasma screen and wireless mouse when her eyes were tired.

As with the findings reported in Pettit and Kukulska-Hulme (2007) on alumni's use of mobile devices, the interviewees reported very strong individual preferences. For one interviewee, she stated *"My life wouldn't work without the mobile phone."* She also relied on a laptop *"That goes pretty much everywhere with me ... My bag is big enough to carry a laptop, I bought it that way ... I don't have holidays from the laptop."* She explained that the laptop was also useful if she needed to find a quiet place to work away from the desktop computer. With the combination of mobile phone and laptop, this interviewee felt no need for a PDA: *"I do what I can on the [mobile] phone, but generally that's too small for me to see ... [The PDA] would give me a bit more screen, but not that much more than the phone."*

For another interviewee, a mobile phone was not important but a memory stick was crucial. Yet another interviewee had owned a succession of mobile phones across a decade. He also reported using a number of other devices including a laptop, smartphone, MP3 player, memory sticks, iPod, digital camera, and PlayStation. For him, a smartphone served the additional function of storing and transferring files; he cited the benefit, compared with a memory stick, of being able to view the files and sort them without needing another device, like a laptop or desktop computer, for this purpose.

Wi-Fi was seen by one interviewee as a motive for a *"step change in the use of the mobile Internet."* She explained:

I see more and more people with devices that they buy for personal use that have Wi-Fi, [so they can] access the Internet wherever there is a Wi-Fi connection ... Lots of people were put off by basically paying a phone company; whereas, given a free connection, they are prepared to pay the device cost but not the connection.

INTRODUCTION TO THE FUTURE

By their nature, interviews are of course partial and incomplete. In any case, these accounts show some of the diverse ways in which Mobile 2.0 is mixed with more conventional practices, and, as with the work from Jones et al. (2010) quoted earlier, they demonstrate the importance of researching how people are actually using technological devices and services. They show the way individuals make creative choices about which devices to use, where, and for what purposes.

This perspective of mixture and choice is important when considering predictions about mobile technologies. Just as Web 2.0 can seem to be the inevitable successor to Web 1.0, so commentators on technological innovation can seem to point the way forward along a single pathway, where people are all going in the same general direction even though some are much further ahead than others. A decade ago, Kling (1999) emphasized the limitations (as well as the attractions) of aspects of commentators' "vivid punditry" ("Punditry about information technologies and social change," para. 1), arguing that it was unlikely to foster a deep understanding of the way communications technologies are affecting our lives. MacManus (2009) also points out the difficulties of making predictions about technological futures: "Twitter came out of left field a couple of years ago … What New Thing will we be talking about in two years' time?" ("Conclusion," para. 3)

Trends can change. Keegan (2008), for example, quotes Rob Hinchcliffe, UK community manager for qype.com, a review site enabling users

to share opinions and feedback on local restaurants, plumbers, and other services. Hinchcliffe describes networks such as Facebook as "time-suck" (quoted in Keegan, para. 4) services. In a similar vein, the issue of "social network fatigue" has been raised by some commentators (see, for example, Weiss, 2009).

Nevertheless, certain trends have been discernible for several years. Faster data transfer is one such, though actual connection speeds and network coverage for mobile broadband have been problematic, at least in countries like the UK (Wray, 2009). The extension of connectivity has been another theme: "Eventually we will blanket the globe in wireless broadband connectivity," in the words of Paul Otellini, Chief Executive Officer of Intel Corporation (quoted in Waters, 2008, para. 6). In that same news report, Otellini predicted an Internet that is "proactive, predictive and context-aware" (para. 4), where our mobile devices pull data from the Internet and deliver information that is relevant to where we happen to be. Increasingly, services that were only available via the desktop are becoming accessible through mobile phones—for example, Google Books (http://books.google.com/) (Sorrel, 2009).

It can be difficult to find a satisfactory position between skepticism and the bland optimism of what Goodyear (2006, p. 84) calls the "dominant techno-romanticist discourse of e-learning," which "asserts that time and space are no longer barriers." In negotiating these assertions in order to develop successful Mobile 2.0 practices, tertiary education will need research that is willing to consider several options for the future.

FUTURE RESEARCH ISSUES

Mobile learning is developing quickly and pulling in several directions, with social aspects gaining ever more prominence. In one device-focused version of the future, individuals will keep acquiring more and better devices and will learn to pick and choose which one is good to use at any given moment, juggling between devices for different purposes and for communicating with different sets of people. It is clear that the devices are acquiring new features (and ever more applications). Evidence from practice such as that gathered through the interviews reported on earlier suggests that user preferences override the fact that a device can, in principle, serve many different purposes.

Thanks to the development of cloud computing, there are increasing numbers of people who are happy to use several different devices, some fixed and some mobile, in the knowledge that they can access storage and processing power anywhere and at any time. At the simplest level, this can be browser access to an application hosted on the Web, but cloud services can deliver more than that: for example, users of Apple's (2008) MobileMe service can synchronize their email, contacts, and photos from anywhere, as long as their device has an Internet connection. (For a further exploration of these issues, see Chapter 21.)

In another version of the future, there will be far less need to own computers or carry personal devices, as it will become more commonplace for anyone to be able to use whatever technology is made available in a given location or mode of transport, for example for the general public to walk up to and use in public spaces. This will easily apply to historical buildings and places where people come to find information or to experience an area of a city (Naismith et al., 2005; Reid, Hull, Cater, & Fleuriot, 2005). Morville (2005) observes that navigation is being taken to a new level, in the form of "Wayfinding 2.0 … [, which] begins with location awareness" (p. 71). This can mean using GPS to determine a device user's location in order to provide relevant content and interaction.

When finally "information processing becomes embedded in the objects and surfaces of everyday life" (Greenfield, 2006, p. 18), we will have a "fundamental alteration in worldview" (p. 16) and will be living in the age of "everyware."

Interpretations of this last scenario include a world of "overlays" where one can specify his or her interests or purposes; the environment he or she is in (or moves through) responds accordingly. From a world filled with portable, networked devices operated by people, we are moving towards "ambient intelligence" in which the networked devices are embedded in the environment and will recognize and anticipate a person's desires and needs, reacting to them as appropriate. These desires and needs might, of course, include learning, or wanting to teach or support other people. (See also Ley, 2007; Lee, 2008.)

All these developments, which are largely driven by technology, call for a great deal of research from human and social perspectives. It is not clear, for example, whether anyone wishes to be in a state of perpetual learning (Lee, 2005; Lee & Chan, 2007). It is also not clear what the implications are of switching attention to learning that takes place outside conventional "learning spaces." For instance, investigations are needed into how people recall what they have learned in non-traditional spaces, and into matters of social etiquette when people unexpectedly shift their attention to learning.

IMPLICATIONS FOR PRACTITIONERS AND RESEARCHERS

Hyped they may be, but Mobile 2.0/Web 2.0 are also phenomena that are encouraging or compelling many practitioners in tertiary education to reconsider and develop their teaching, and are stimulating research of the kind outlined above. Although Mobile 2.0/Web 2.0 have unsavory aspects such as the risk of cyberbullying and the uploading of video clips of violent attacks, there is much about them that appears to be attractive and valuable for learning.

In particular, Mobile 2.0/Web 2.0 involve activities that many learners or potential learners are already engaged in for pleasure. They present rich opportunities for students to contribute to their own and others' learning. And because mobile devices are often highly attractive and woven into the texture of so many lives, Mobile 2.0 gives the possibility—though not the inevitability—of increased motivation to learn, and at times and in places that suit the individual.

However, the evidence from researchers such as Kennedy et al. (2007) and Jones et al. (2010) reminds practitioners of the importance of ascertaining which devices and which "2.0" services, if any, their students already use. Educators and institutions need to find out about their own students rather than simply assuming they are like learners of a similar age elsewhere. The findings of these researchers is also a reminder that:

1. members of a cohort may not all have similar levels of ICT fluency, or similar preferences; and
2. what we discover about our learners is only a snapshot at a given point in time; their needs, desires, and characteristics are dynamic, and our educational decisions and investments need to allow for rapid and constant change.

The authors' own study (Pettit & Kukulska-Hulme, 2007) used a questionnaire and interviews to explore the mobile practices of the alumni of a Master's program, who were mainly mid-career professionals. One key finding was the importance of external factors in influencing which devices they used:

One of the distinctive contributions of the interviews was to illustrate how the participants wove particular devices and practices into their daily lives, especially when travelling. The fit appeared to be intense but provisional, and dependent on factors often outside the control of the individual, and certainly of any educator wishing to design learning around smartphones, PDAs or MP3 players. (Pettit & Kukulska-Hulme, 2007, p. 28)

Another factor to be borne is mind is that, for some students at least, high costs may deter them from accessing Mobile 2.0 services. It is also worth noting the finding from the aforementioned JISC study that some of the participants in that study felt they did not receive enough ICT support from their university, and that in this respect the "proportion is higher amongst arts students" (Ipsos MORI, p. 8). (For further discussion of the role of academic and professional staff in supporting learners, see, for example, Chapters 13 and 21 in this book.)

In addition, where students do not currently envisage the potential of certain "2.0" services for formal learning, this is not the end of the story. Students' attitudes here may well be intertwined with a school-derived, top-down model of teaching (Ipsos MORI, 2008). One possibility, which calls for further research, is that changing learners' conceptions of teaching may increase their openness to the use of Web 2.0/Mobile 2.0 in formal learning.

CONCLUSION

The image of a learner sitting at an outdoor café, enjoying an attractive lifestyle while using a mobile device, has been iconic (or a cliché) for some time. Such an image was used, for example, in a video demonstrating what might become possible at some point in the future if nanotechnology were to be used in "bendable" mobile devices. In the computerized graphics-based video, these devices were unwrapped from the wrist, spread flat for text input, then rewrapped. Wray (2008) wrote that "The developers say the project is based on real research and is not just an aspirational piece of design" (para. 4).

Convenience and connectivity are powerful themes in many of the announcements in this area, but for educators it is important to ask what sort of learning these might encourage. Many of the innovations involve professionally produced content, and/or a model of learning in which the main goal is to connect learners to information. This is not necessarily undesirable, but neither is it necessarily very innovative. It therefore may not exploit the most interesting features of Web 2.0/Mobile 2.0.

This chapter began with a question, asking how far Mobile 2.0 is moving into formal learning. Although there are signs of this happening, there remains the major challenge for practitioners of resolving the dilemma set out at the beginning—namely, that one of the attractions of "2.0" for users is that it is perceived to be theirs, not ours. Returning to the territorial metaphor in the opening sentences of the chapter, can we, as practitioners, find ways to encourage learners to cross that border from "Personal 2.0" to "Tertiary Education 2.0"? And will they still enjoy—and still own—what they find on the other side?

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KEY TERMS AND DEFINITIONS

Cloud Computing: Information is stored in servers on the Internet and can be accessed by users from any computer. For example, Google Apps provides common business applications that can be used directly from a web browser.

Informal Learning: In contrast with formal learning, informal learning is not organized and structured by an institution. It may take place in environments that have some connection with learning, such as museums and art galleries, or anywhere the learner chooses, including the home, workplace, or community.

Multimedia Messaging Service (MMS): A mobile phone standard for sending messages that can include multimedia objects in the form of images, audio, video, and text. The most popular use is for sending photographs.

Mobile 2.0: A term used to refer to services that integrate the social Web with mobility and the use of mobile devices. An example of a popular service is Twitter, which can be used from a web browser on a desktop computer or directly from an Internet-connected mobile device (e.g., a smartphone or PDA).

Pervasive: The aim of pervasive computing is to create a computing infrastructure that permeates the physical environment, that is, chips and sensors are embedded in everyday objects.

Photo Ssharing: The practice of sharing digital photographs with others, on the Web or on mobile devices; facilitated by websites such as Flickr.

Social Bookmarking: Free web services/tools that make it easy for users to save and tag links to web pages that they want to remember or share with others. Delicious is a popular example of a social bookingmarking site/utility.

Social Network Fatigue: The stress or boredom allegedly felt by some users after prolonged participation in social networking sites.