

0288 Students and mobile devices: choosing which dream

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Abstract

There is a crisis looming and a paradox emerging. Many educators advocate, promote and encourage the dreams of agency, control, ownership and choice amongst students whilst educational institutions take the responsibility for provision, equity, access, participation and standards. The institutions traditionally procure, provide and control the technology for learning but now students are acquiring their own personal technologies for learning and institutions are challenged to keep pace. These allow students to produce, store, transmit and consume information, images and ideas; this potentially realises the educators' dream but is for institutions potentially a nightmare, one of loss of control and loss of the quality, consistency, uniformity and stability that delivered the dreams of equity, access and participation. This paper traces the conflicting dreams and responsibilities.

Introduction

Mobile devices include smart-phones, games consoles, digital cameras, media players, netbooks, in-car sat nav and handheld computers. Almost every student owns one and uses one, often more than one. Not only do they own them and use them but they also invest considerable time, effort and resource choosing them, buying them, customising them and exploiting them. These devices express part or much of their owners' values, affiliations, identity and individuality through their choice and their use. They are both pervasive and ubiquitous, both conspicuous and unobtrusive, both noteworthy and taken-for-granted in the lives of most—but not all—students.

This is new and is completely different from older, static and less personal information technologies such as desktop computers and TVs. It is a quantitatively different phenomenon and the statistics are commonplace: mp3 downloads outnumber CD sales, camera-phones outnumber cameras, smart-phones outnumber laptops, mobile phone ownership is reaching saturation and the British send over a billion texts a week.

Mobile devices are however also a qualitatively different phenomenon. Students no longer need to engage with information and discussion at the expense of *real life* but can do so as part of *real life* as they move about the world, using their own devices to connect them to people and ideas, ideas and information of their own choosing, perhaps using their own devices to generate and produce content and conversation as well as store and consume them. This is changing how students relate to technology. It is also changing how they relate to other students and to the content and conversation facilitated by the technology, so consequently it is changing how they relate to learning and to education.

This *thought piece* looks at these devices in the hands of so many students and the challenges and opportunities that these devices represent for the support and provision of learning, and indeed for the meaning and nature of learning. The phrase *student devices* is used to signify not mobile devices in general nor the purely technological characteristics of specific categories of mobile devices nor those mobile devices that might be especially suited to learning or already used in education. The phrase is used emphatically to explore the educational and institutional implications of students' choices. It is understandable that much of the discussion will focus on mobile phones considering their massive dominance in students' lives, but the increasing functionality and power of the mobile phones that students buy mean that very few mobile technologies are not coming into the hands of most mobile phone owners and thus into the hands of most students. Of course, a much wider range of mobile devices is in circulation but we need to remember the demographics of all these various devices and acknowledge the primacy of the mobile phone amongst the less privileged.

The devices themselves are important, as are the systems, networks and infrastructures that support them. The probable trends in functionality, availability, ownership and use are also important, as is the operation of the market-place through the networks, the content providers, the service providers and the hardware manufacturers, in determining what gets promoted and what gets ignored.

These are factors that put devices in the hands of students, and constrain and position their use. At that point, other factors come into play, those factors are part of an evolving dynamic between technology, on the one hand, and society, including education on the other, as students, communities and institutions adapt and evolve around the technology. The particular significance of widespread mobile devices in this respect is their impact on ideas about information and knowledge, and about the nature, support and delivery of learning, and on how these evolve.

This *thought piece* explores these issues and specifically looks at the challenges, from the practical to the philosophical, that universities face if they are to move in a direction that is positively aligned to this dramatic rise in students' own devices.

The technology, and its ownership, access and use

If we look at mobile devices and technologies, especially if we make a comparison with desktop technologies, what we see is diversity, transience and incoherence. There is no standard footprint or format. The devices come in all sorts of shapes and sizes, from slim matchbox to sturdy paperback book, landscape or portrait. They may open out, slide open or neither; they have all sorts of keyboards (some virtual, some real) and screens; they may respond to touch, gesture or stylus, they may capture or play various media and connect to various networks and peripherals. They run various operating systems, applications, networks and connectivity, any of which will change overnight, even if those are supposedly stable and standard.

These devices are developed and designed for various retail niches and corporate markets, certainly not for learning, however informal. This should not be a surprise; educational technology has always been parasitic, originally co-opting desktop computers intended for corporate business customers and now trying to co-opt mobile devices intended for individual lifestyle customers. This process continues today (Hemmi *et al*, 2009) and has been rigorously explored (Bar *et al*, 2007). Not one of these technologies was intended for educational use and so they continually challenge educationalists to develop educationally sound applications

From a purely technical perspective, we could explore new mobile technologies coming to maturity and perhaps coming to market; the issue however is not technology *per se*. The issue is how technology is packaged, presented and marketed. Given current trends, it seems inevitable if there is a business case for these or any other features then they will be marketed around mobile phones, though extra features will also go into media players and games consoles too.

Having looked at mobile devices and technologies, we see some underlying differences with desktop PCs. The design and manufacture of mobile devices produces a closed box and, unlike PCs, manufacturers cannot adapt to evolving markets by putting in extra cards for graphics processing, increased memory, enhanced connectivity or games functions and cannot easily plug extra or improved peripherals such as better screens, joysticks or concept keyboards. This inflexibility may mean manufacturers are conservative and target discrete segments in the market, the youth market being one of them. Images of the inside of any mobile phone illustrate that mobile devices are not designed to be upgraded, serviced or even opened, just used and discarded.

Sales figures (for example, Kumar, 2004) show that many buyers and users clearly prefer specialised, dedicated devices such as the Apple iPod, the Tom-tom, the RIM BlackBerry or the Sony PSP rather than any generic and more general-purpose device and clearly many buyers echo Rolt's (1947) remark that, 'Manifestly it is better to use simple tools expertly than to possess a bewildering assortment of complicated gadgets and either neglect

or use them incompetently.’ Therefore, whilst we have seen the migration of most PDA functionality into phones, this has not led to the emergence of some generic converged device or even some generic converged platform or architecture and the market is *segmented* by “understandings of the consumer held by those in the mobile operators industry” (Green *et al*, 2001:1). Furthermore, consumer choice favouring divergence, individuality and constant innovation coupled with device design and manufacture targeted at niches and an architecture based on dedicated closed boxes means that this situation will not change. We can say only that the devices owned by students will be, at best, poorly suited to learning, will all be different and will all be changing, often for reasons that are not technical, not educational and probably not even rational or foreseeable.

This is not a helpful picture for universities hoping to plan around mobile devices. There is reassurance in prediction; it puts change in a context and gives a basis for planning.

The social aspects of mobile devices

The personal, cultural and social aspects of these trends hinge in many respects on the essential difference between desktop technologies and mobile technologies, a difference that means we can ignore the former but not the latter. Interacting with a desktop computer takes place in a bubble, in dedicated times and places where the user or student has their back to the rest of world for a substantial and probably premeditated episode. Interacting with mobile technologies is different and is woven into all the times and places of students’ lives. Mobile phones have created “simultaneity of place” (International Telecommunications Union, 2004:20, paraphrasing Plant, 2002): a physical space and a virtual space of conversational interaction, and an extension of physical space, through the creation and juxtaposition of a mobile social space. This affects people’s sense of time, space, place and location, their affiliations and loyalties to groups and communities, the ways in which they relate to other individuals and to groups, their sense of their identity, and their ethics, namely their sense of what is right, what is approved of and what is inappropriate.

When we say we can ignore desktop technologies but not mobile technologies we mean that desktop technologies operate in their own little world, mobile technologies operate in *the* world.

Mobile devices demolish the need to tie particular activities to particular places or particular times (in spite of the ubiquitous ‘I’m on a train ...’ gambit). They are reconfiguring the relationships between public and private spaces, and the ways in which these relationships are penetrated by mobile virtual spaces. Virtual communities and discussions had previously been mediated by static networked PCs in dedicated times, places and spaces. Now, mobile technologies propel these communities and discussions into physical public and private spaces, forcing changes and adjustments to all three as we learn to manage a more fluid environment. This is documented in the literature of mobilities, for example the new peer-reviewed journal of that name, and various authors remark that the private “is no longer conceivable as what goes on, discreetly, in the life of the individual away from the public domain, or as subsequently represented in individual consciousness”, (Cooper, 2002:22) “that massive changes are occurring in the nature of both public and private life and especially of the relations between them.” (Sheller & Urry, 2003:1) and that “The use of these mobile sound technologies informs us about how users attempt to ‘inhabit’ the spaces within which they move. The use of these technologies appears to bind the disparate threads of much urban movement together, both ‘filling’ the spaces ‘in-between’ communication or meetings and structuring the spaces thus occupied.” (Bull, 2005:334).

People comment on the use of mobile devices, often phones but more usually media players such as the iPod, to re-appropriate, public space or work time back into the private; with a mobile device, there is 'no more dead air' (Bull, 2005).

Mobile technologies are redefining discussion and conversation. Rather than these being set aside as something done at certain moments, for a delimited stretch of time, usually in a private space (or semi-private phone 'box' or 'booth'), Sheller (2004:5) says there is now "a constant flickering of conversation". Furthermore in order to manage the intrusions of mobile calls and conversations into real time and space (or *vice versa* perhaps), we are evolving a set of non-verbal actions and interactions with the mobile phone in public. In order to maintain discourse and connectedness across different spaces we are devising and learning new protocols. We are devising new *tie-signs* (Goffman, 1971) in order to manage simultaneous conversations in real and virtual space, allowing us to service different types of conversation without offending either our real correspondents or our virtual ones. We have to manage *enforced eavesdropping* (Plant, 2002:47) and adopt *civil attention* (Goffman, 1971) where our neighbour in the train or bus, for example, holds a private, intimate and probably embarrassing conversation with some unseen other and we have to make gestures that signal that we are not paying any attention, averting our gaze or shifting our stance.

Mobile devices eroding established notions of time as the common structure, for scheduling, co-ordinating and organising activities and events. Various authors talk about the "approx-meeting" and the "multi-meeting" (Plant, 2000:31), about 'socially negotiated time' (Sørensen *et al.* 2002:3) and the 'micro-coordination of everyday life' (Ling, 2004:69) alongside the "softening of schedules" (Ling, 2004:73) afforded by mobile devices as we use them to adjust our schedules and our commitments *on-the-fly* as events unfold. Finally, Nyiri (2006:301) says, "with the mobile phone, time has become personalized" whilst Fortunati (2002) says, in a piece that addresses and analyses many of the issues covered here, that "The mechanical representation of time is more and more unacceptable at a social level. In other words, the abstract, uniform and unitary time of the clock is sinking further and further down in relation to electric and satellite time. With the possibility of perpetual contact, the mobile phone ends in fact by shaping time as a container of potentially continuing connection."

Mobile devices are also eroding physical place as a predominant attribute of space. The phrase *absent presence* (Gergen, 1996) describes situations where groups of people physically together, co-located, are all connected elsewhere. Mobile devices now enable us to carry our various virtual communities with us but physical communities—the family, the town, the university, the cohort—become devalued. Mobile devices are creating communities and groupings, sometimes transient and virtual, arguably at the expense of existing and traditional ones. In some cases, this is because increased connectivity and functionality have meant that social networking sites such as Facebook have adapted and migrated to mobile devices, in other cases social networking sites native to mobile devices, such as Mxit, Twitter and Jaiku, have developed and flourished.

Sometimes the device itself, the early Walkman (du Gay *et al.*, 1997) and the first cell phones for example, signify membership of a community. In other cases, specific groups or communities use the devices in their own exclusive way: txtspeak in its early days served this purpose (Shortis, 2009 and Thurlow, 2003 both give considerable context to this remark) and around the world different communities use the *missed call* differently (Donner, 2008). More significant though, mobile devices have catalysed a range of communities, transient and ephemeral perhaps, and sometimes described as *smart mobs*, groups of interconnected people forming a distributed

intelligence, around particular political, artistic or social issues (Rheingold, 2002). With each of these groupings come new norms, expectations, ethics and etiquettes and shifting ideas about the self and identity. Our social networks are part of the construction of our identities in the sense that we say who we are and we learn who we are by who we associate with and by who we are comfortable being seen associating with. Increasingly, online social networks are part of this identity construction and these are becoming mobile, perhaps reintegrating the virtual and the actual.

At the mLearn conference in 2007, Charlie Schlick, Product Manager of Nokia, described company practice in talking of mobile phones as ‘our new private parts’. These devices are personal, universal and closely linked to identity and in talking about student devices we must recognize how closely they are bound up with a changing sense of self. Some authors describe personal mobile devices as becoming prosthetic; Raul Pertierra (2005:27) says, “Unlike desktops and other immobile technologies, mobile phones more closely resemble tools or prosthetic devices as extensions of the body. They become extensions of the hand, allowing us to connect anytime, anywhere, with anybody. Bodies themselves become writing devices as phoneurs negotiate new urban spaces.” Other authors describe them as becoming embodied (for example, Rettie, 2005).

The educational implications of student devices

Many of the implications of these remarks for universities are still unclear. However, we can tease out some of them which could be addressed at a number of levels. There is the purely tactical level; universities are fundamentally sound but need to tinker with perhaps timetabling, network security, outreach, staff development, assessment regimes, the wording of acceptable use policies or the constituents of blended learning and all will be well.

An obvious implication for working with students is the need to recognise that expectations about face-to-face interactions are now fragmenting more than ever, and that different groups of people will have different ideas about courtesy especially in relation to mobile phones; there will be different expectations about whether to answer a call or a text whilst in an interview, tutorial or lecture.

Mobile devices are defining and supporting new communities and their aspirations; attitudes and idioms must be understood and addressed if they are to have parity of access to university education. These transient and mobile communities have their own norms that determine what is acceptable. These norms might govern etiquette, taste, language, values and ethics, and the educators must understand these in order to work effectively within these communities.

The services, connections, discussion and content—and university education is all of these—are no longer seen as dependent on face-to-face contact at predetermined times. Educational provision is built around time and place: the timetable, hand-in dates, the classroom, the year-group, the deadline and the laboratory. These observations suggest that the education system, especially the formal university system, is getting out of step with how many students perceive the world they live in and that, irrespective of the significance and reaction to student devices, changes are needed to keep universities aligned to a changed and mobile society.

Physical locatedness is further weakened by the increase in *cloud computing*, (as described in Wiess, 2007). This is the phenomenon of data, applications and processing moving away from specific hardware hosts and into the Internet. The combined consequence for universities will be to challenge the primacy of institutionally controlled desktop computers. A different medium-term trend will be for these activities to move into the environment,

into buildings, furniture, vehicles or clothing, and to become ambient and pervasive (Satyanarayanan, 2001). The consequence for universities will be to accelerate the convergence of physical architecture and virtual architecture, and to blur the boundaries between institutional space, social space and personal space, and the *outside world*. At the same time, learning and knowledge are less anchored in physical artefacts. eBook readers and media players, for example, mean that books and records are longer necessary to store and transmit literature and music. Video-on-demand is another part of the transformation of live social performance into consumable artefact and now into disembodied asset.

These are all part of an *epistemological revolution* (for example, in the sense broadly outlined in Des Bordes & Ferdi, 2008), a phrase used to express the fact that computers and now mobile technologies are revolutionising what we know and how we know it, and hence what we learn and how we can learn it. In talking in these terms, we should however be careful not to obscure the nuances and differences between individual devices and technologies and the various ways in which different cultures and organisations with society adopt and adapt them. To portray the demography of ICT access as simply ‘digital immigrants’ and ‘digital natives’ (Prensky, 2001) is to over-simplify a situation where different technologies, desktop and mobile, are adopted by different communities, cultures and sub-cultures in different ways at different rates.

These factors are significant to learning and education, and to how the universities tackle the challenge of student devices, because they reveal how central these devices and technologies are to the lives of almost everyone in our society.

Ownership of technology, knowledge and learning

These changes and trends will cause significant shifts in the idea of *ownership*, specifically the *ownership* of technology and of knowledge. We mean here that more students and a greater range of students will buy and possess mobile devices and access information. We also mean however that through this process, these students will gain greater confidence, agency and familiarity with the technology exemplified by mobile devices and with the knowledge mediated by them. Increasingly, they will feel less inhibited and less intimidated by knowledge and technology since they will form a greater part of their everyday lives, under their control and not the prerogatives of affluent students from more entitled social classes.

This is probably obvious in relation to technology but less so in relation to knowledge.

In the case of the technology, the increasing capacity, capability and functionality of mobile devices means that activities associated with landline telephones, analogue cameras, desktop computers, TV sets and music centres are now all converging on devices that have become as commonplace, personal and taken-for-granted as the wristwatch and the cigarette lighter. This has taken place over about 10 years. The impact of this on students’ attitudes to technology, especially to computer technology and digital technology, must be profound, though of course very different for different age groups, and hence different for mass-participation universities as opposed to traditional universities.

In the case of knowledge, and of course in the case of information, images and content in general, this is also true but we must distinguish between the consumption of knowledge and its production.

Mobile devices, especially connected devices, enable students to consume, that is, to access and store, all sorts of knowledge almost instantly and

almost wherever they are, with little or no effort compared to earlier technologies. Now practically all types of information, files and formats, available from Wikipedia, Google Scholar, Flickr, iTunes, YouTube, Facebook, Google Maps and BBC iPlayer are easily accessible on mobile phones. Podcasts of academic courses are available from the world's universities. This shifts the educational locus and authority away from face-to-face provision and delivery, and away from formal educational institutions. Student devices are an integral part of these processes.

The changed sense of the *ownership* of technology and knowledge, just described, has practical implications for the actual ownership of technology and knowledge within education itself. We come to these later.

In addition to the changing *ownership* of knowledge, mobile devices deliver this knowledge *chunked*, structured and connected in very different ways from earlier learning technologies such as the lecture, the web and the book. Knowledge is not abstract, unaffected by how it is stored, transmitted or consumed. In its earliest forms, knowledge and learning came from lectures, a linear format from an authoritative 'sage-on-the-stage' with no *pause, fast forward* or *rewind*, and from books, substantial and linear but segmented and randomly accessed. The delivery of knowledge and learning by networked computers meant a break from linearity with the introduction of hyperlinks and new heuristics of usability that prescribed how knowledge and learning should be *chunked* and presented. With mobile technologies, using a small screen and a limited input medium, the usable *chunks* become much smaller but the navigational overheads become much larger. In essence, small pieces of knowledge and learning can be easily presented but their relationship to any others may be difficult to understand, thereby fragmenting and perhaps trivialising what students learn.

The patterns of use, that is, the various ways in which people interact with technologies, also differ dramatically if we compare sedentary desktop technologies with mobile personal technologies. The use of desktop computers, documented in the research literature of HCI, is well understood, well established and much more tractable than is the use of mobile devices (see Jones & Marsden, 2006). Our understanding of how people engage with information as they walk down the street and perhaps share devices with friends is still relatively limited. Words like 'lightweight', 'opportunistic', 'informal', 'spontaneous', 'episodic', 'private' and 'personalised' are found in the literature but this is often impressionistic. Nevertheless, creators, publishers and providers of content (and navigation and organisation) must adapt to these findings as they emerge if the student experiences is to be optimal.

In the final panel discussion at the 2007 mLearn conference in Melbourne, Professor Mike Sharples, with the other panel members, was asked about the role of universities in an age where mobile devices, student devices, gave universal access to facts and information. His answer, perhaps tongue-in-cheek, was that universities could at least still give degrees. This is another aspect of student devices in relation to the consumption of knowledge and at the very least, implies that assessment regimes, both what is being assessed and how it is assessed, are seriously challenged by the affordances of student devices.

Moving from the consumption of knowledge to its production, the increased functionality of mobile devices is hastening the convergence of mobile technologies with the wider *user-generated* content movement associated with web2.0 rhetoric and technologies. This is the movement promoting the web as a medium for writing and participation not just for reading and passivity. It uses technologies such as wikis, mashups, blogs, newsfeeds and podcasts to move the web from a centralised broadcast medium to one where everyone has a voice. Mobile devices extend and enhance this voice because they allow users to capture content, for example images, sounds,

data and voices themselves, from the *real world*, from events as they happen, specific to when and where they happen. The rise of *citizen journalism* (for an account and analysis, see Ananny & Strohecker, 2002) is a very specific example of the power of mobile phones and ‘user-generated’ content. Meanwhile, previously unknown musicians and disenfranchised political groups use the same technologies to propagate their material and their views, and in doing so they create a more fragmented and complex world where the received wisdom and the accepted tastes no longer have the hegemony or the authority that they had in more static, stable times.

Mobile students are now able to create, access and publish not only facts about the outside world but the inside world too, information about themselves, their friends and affiliations, their feelings, their days and their doings. Every mobile phone has personal information management software, that is calendars, tasks, notes, contacts *etc.*, that can be made visible to the chosen few or the unchosen many but now social network software, such as Facebook, Jaiku or Twitter, on mobile phones can capture and distribute content that is less purely functional and much more intimate. The wider visibility of this personal information is part of the transformation of identity and student’s sense of themselves and their communities, no longer based in the purely physical and the face-to-face.

Whilst much of this account of the consumption of knowledge sounds benign, for example the dramatically increased levels of individual choice, control and convenience, there are drawbacks. The first is that these developments reinforce a tendency to view knowledge and other forms of content merely as commodities or assets. The second is that this choice and control are exercised at a purely personal level, allowing individuals to each pursue their own curiosity, constructing their own private libraries and inhabiting their own worlds of knowledge. This erodes the idea of a commonly accepted canon, a common curriculum, of things we all need to know and are assumed to know and replaces it with what some people have referred to a *neo-liberal nightmare*—not dream but nightmare.

This will have consequences for the perceptions that students have of their universities. Historically these granted the less well-off access to learning, knowledge and technology but this access has always been constrained by lecturers, teachers, employers, librarians and caretakers, by exam boards and by opening hours, by preferred suppliers and by acceptable *white-listed* URLs. Student devices change all this and challenge the role of the education professions and the educational institutions, progressively demystifying their roles as gatekeepers, custodians and arbiters of technology and knowledge. This is not to ignore their role as guides or intermediaries, nor is it to ignore their work in nurturing intrinsic motivation and providing extrinsic motivation, merely to place them all in a more complex context.

***Disruption* – nuisance, threat and student devices**

Disruption is often used about mobile devices in educational settings (for a typical example, see Sharples, 2001). The exact meanings of the word are not usually unpacked but they have considerably greater significance and force when we think about student devices rather than institutional devices. There is a *weak* version of disruption that amounts to nuisance; phone calls in class, texting in exams, photographs that should not be taken, inappropriate ring-tones and so on. There is however also a *strong* version of disruption. These devices allow students to access and store images and information of their own choosing and perhaps create and distribute new images and information independently of the lecturers and of the university. The long-term consequence must be to challenge the authority of the curriculum and the institutions of formal learning. At the moment, education is still delivered primarily and knowledge is accessed primarily through

formal institutions on institutional premises. The technology to enable this is accessed on institutional premises. This gives institutions enormous power and control over the nature and style of learning that can be accessed, especially by less affluent students with few alternatives.

The institutions of formal learning regulate and control access to knowledge, technology and learning for less privileged parts of students: the universities are also the agents of equity and inclusion. Our point here though is that student devices confront this stranglehold on learning, the universities and the lecturers are no longer the gatekeepers.

Interestingly, Selwyn (2003) uses similar but different sources and analysis to draw a similar picture of the UK schools sector.

Infrastructure, blending, procurement and sustainability

Student devices present a major challenge to many of the institutional practices and procedures associated with ICT and 'conventional' desktop e-learning. It is easy to say that education should embrace student devices but not easy to say how. This is part of the paradox. Historically, institutions rather than individuals have taken the responsibility for the provision of the IT needed to deliver and administer learning. This can be explained as the benign industrialisation and electrification of learning, necessary to deliver modern mass learning, ensuring quality and uniformity, and mapping standardised curricula onto standardised technologies. All too often, the institutional provision of IT led to a very narrow prescription about the hardware, peripherals, connectivity, operating systems, applications and privileges that could be accessed by students and lecturers. In the era when the dominant technology was networked desktop PCs this made sense, at least in terms of procurement, installation, support, staff development and user training, and was usually managed through a centralised IT unit.

As more mobile technologies proliferated, this has become a less tenable approach and has been seen as a constraint on personal and professional choice amongst lecturers, and amongst students, rapidly acquiring their own personal technologies and wanting to access institutional learning resources. In technical terms, the diversity and transience of mobile devices are orders of magnitude greater than with desktop technologies; in financial terms, this transience and diversity are insupportable and increasingly seen as unsustainable (UCISA, 2009) Experience in early pilots (for example, Traxler & Riordan, 2004) suggested that students were not likely to value a second device, a university-provided device, that did not express their taste or aspirations and that it would inevitably be the one left at home.

On the other hand, wholeheartedly adapting an approach centred on student devices is challenging and radical for institutional IT units. Their roles would change drastically, depending on the institution and its mission, and on its finances.

Furthermore, university IT units would take the lead in implementing whatever policies are considered necessary for uniformity and equity. This might include issuing vouchers for purchase or hire of devices, for airtime and connectivity (voice, messages, data) as appropriate. It might also include standards and minimum specifications within which student choice and purchase could be managed. Standards and specifications are attractive and it might be possible to promulgate national standards but even in stable areas of IT, standards do not have a good record.

Blending, the term used for the integration of different and appropriate technologies in order to deliver and support optimal learning, is another key concern in the acceptance of student devices. How can educational quality be assured when one of the components of delivery is so diverse and

volatile? Can student devices only be used for optional or enriching material, or perhaps only with specified categories of students?

The ethics of student devices

There are various ethical aspects to the increasing prevalence of mobile devices in our society and these have an immediate bearing on any consideration of student devices. Ethics covers everything from the legal and regulatory aspects of our actions, utterances and behaviour to informal expectations about etiquette, expectations, protocols and norms. Ethics are a major constituent of culture and identity (because our sense of right and wrong is part of who we are and who we feel comfortable with and so differs across sub-cultures, generations, social classes and ethnic communities.) Many of what we described as the social consequences of mobility have ethical aspects, even something as simple as texting in class or answering a call whilst eating.

Student devices mean that we are moving away from the simple dichotomies of regulating acceptable use. At the risk of over-simplifying, we used to make a distinction between *formal* learning activities *in* our universities *on* our equipment and *self-motivated* learning activities *outside* our institutions *not on* our equipment. We had a duty to regulate the former and had no mandate to regulate the latter. If we are to embrace student devices, this simple dichotomy breaks down and the boundary becomes blurred. Guaranteeing e-safety becomes more problematic when on the one hand we encourage the use of student devices for learning but on the other hand have no ability or authority to control how, when or where they are used, nor any control over the applications, data or networks they support. At the very least, policies of acceptable use must evolve rapidly to address the affordances of student devices.

There are other issues. With increasingly sustainable and sensitive contextual information, student devices necessarily can give institutions far greater insights into the locations and behaviour of students. Enriching the educational experience must involve engaging as fully as possible with this contextual information and perhaps linking it to other education systems such as learning platforms or attendance registers. With this comes the potential for greater surveillance and oversight of students. Concerns about privacy and surveillance may stop some students volunteering their devices. Some students are already saying, 'not on my phone' because they feel educational material on a personal, social and recreational phone is intrusive (eg informal analysis of data from MELaS project data by author).

Other issues of student devices are merely the issues of any mobile devices used educationally not just those owned by students. The problems are increased however when the boundary between personal and educational becomes blurred.

Inclusion and student devices

Many of the previous remarks about student devices, for example those about *ownership*, identity and personalisation, seem to make the case for student devices as an expression of consumer choice and student preference and thus put student devices in a positive or benign light. There are several areas however where an unqualified acceptance of student devices, an acceptance that would imply that universities unreservedly support whatever devices are preferred and owned by students, is problematic. One of these areas is equity or fairness, ensuring equality of opportunity and access. If institutions are to embrace student devices there must be provision for everyone to have the same kind of provision. This means not just devices for everyone, but everyone owning the device they choose. Anything less than this creates divisions and hierarchies but needs complex resourcing

since student devices are not merely hardware devices but also involve connectivity and airtime and, by definition, cross the border between personal and educational use.

Quality, training and content for student devices

Other areas where the unconstrained operation of student choice is problematic include quality assurance and staff training. In both these areas, we have to recognise that the problem does not just lie between students with their devices on the one hand, and technology support and infrastructure on the other. There is also the educational component, mediated by teachers and lecturers. Currently there are many small-scale pilots and projects using mobile devices to deliver or support learning. These are taking place in every sector (and in many countries) (see for example, Traxler *et al.*, 2008). With the exception of those using SMS, Flash, Bluetooth, podcasts or perhaps Java, they all depend on students being provided with devices. Many of these pilots and projects are looking to explore mobile learning and to learn lessons and from a methodological perspective, this is easier with a homogeneous and predictable technology platform. It is also easier from a staffing and infrastructure perspective since planning and training are comparatively straightforward. It does however mean that most mobile learning pilots and projects are unsustainable because they are predicated on finance in order to provide subsequent cohorts of students with devices. Working with student devices solves this problem but faces staff developers with the enormous challenge of preparing teachers and lecturers to work with a range of devices that cannot be predicted, of preparing content and lessons for a range of devices that cannot be predicted and of ensuring the ongoing quality of courses across this unpredictable range of platforms. This is a considerable challenge, a major paradigm shift and another part of the paradox.

Which dreams and responsibilities?

To return to our starting point of dreams and responsibilities, we see a paradox approaching. Student devices unlock the dreams of agency, control, ownership and choice amongst students but put the dreams of equity, access and participation at risk. Universities cannot afford, procure, provide nor control these devices but they cannot ignore them either. Clearly such a stark choice is an over-simplification; there is no simple question and no simple answer.

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