2 Is the Revolution Justified?

I t is common for observers and bloggers (including myself) in educational technology to proclaim that the current educational practice is, in some way, 'broken'. It is seen as not delivering deep learning, or failing to meet the needs of students, and of potentially becoming irrelevant to a new generation of digital learners. Before exploring the potential impact and benefits of a digital, networked, open approach, it is worth taking time to place these claims within some context and to give a sober assessment of much of the rhetoric that surrounds technology and education.

These calls for revolution have a certain innate appeal and are often based on a genuine concern for the well-being of higher education. For example, here I am arguing that the online learning environment can be seen as a metaphor for the change needed by universities:

> … that the online learning environment is not peripheral, or merely a technological issue for universities and educators to resolve, but rather that it represents the means by which higher education comes to understand the requirements and changes in society, and thus the route by which it maintains its relevance to society. (Weller 2009a)

And here is John Seely-Brown (2006) making a compelling claim for the need for change in education:

> As the pace of change in the 21st century continues to increase, the world is becoming more interconnected and complex, and the knowledge economy is craving more intellectual property.

And Marc Prensky's (2001) opening statement for his article on digital natives claims that students have changed radically:

> It is amazing to me how in all the hoopla and debate these days about the decline of education in the US we ignore the most fundamental of its causes. *Our students have changed radically. Today's students are no longer the people our educational system was designed to teach*. (Prensky 2001)

Carie Windham (2005) makes a claim about the irrelevance of higher education:

> In a world where technologies change daily and graduates armed with four-year degrees are entering the workforce in record numbers, there is an

increasing fear among the Net Generation that a four-year degree will be neither relevant nor sufficient preparation when it becomes time to enter the work force.

The aim of this chapter is to examine the empirical evidence for any such revolution in higher educational practice, based on the behaviour of online learners.

The net generation

This isn't a book about the net generation, but that literature represents a good starting point for examining some of the claims on the impact of technology, since many of the claims for educational reform are justified by reference to the net generation or digital natives. There is some appeal in this, and we feel that a generation which grows up with access to the kinds of information and tools the Internet offers will be likely to use these for learning, which will therefore differ substantially from the kind of educational experience most people over the age of 35 experienced. However, separating myths and hype from the evidence in this literature is often difficult. The following are potential areas where we could extrapolate a need to alter educational practice.

Context

There is a need to start with some solid foundations to move forward from. So, first, let's examine the evidence that students use computers and the Internet at all in learning.

It seems a truism to say that current university students and those who are younger to them have greater exposure to information and communications technologies (ICTs) than previous generations. Marc Prensky (2001) bases much of the digital natives argument on the fact that 'today's average college grads [in the United States] have spent less than 5,000 hours of their lives reading, but over 10,000 hours playing video games (not to mention 20,000 hours watching TV)'. We know that accessing computers and the Internet for learning is now so commonplace as to seem normal.

The UK Children Go Online report (Livingstone and Bober 2005) states that

90% of 9–19 year olds who go online daily or weekly use the internet to do work for school or college and 94% use it to get information for other things. And that 75% of 9–19 year olds have accessed the internet from a computer at home.

Further to this, we know that students value computers and the role they play in learning. For example, in a study on higher education students in South Africa,

Czerniewicz and Brown (2008) found that '72% of students were extremely positive about the role of computers in learning and have a high opinion of their own abilities/ self efficacy'.

They also found that students used computers for learning even when they were not asked to do so, and they used computers informally. This was particularly evident in the case of communicative media where 55 per cent of staff asked students to use communicative media as part of their courses; yet 75 per cent of students reported using communicative media regularly for their learning.

This informal learning theme is continued by Oblinger and Oblinger (2005), who reference Grunwald (2003):

> When teenagers are asked what they want from the Internet, the most common response is to get 'new information.' Close behind, at about 75 percent, is to 'learn more or to learn better.' The use of the Internet to learn is not limited to school work. Students are often informal learners, seeking information on a variety of topics, such as personal health.

We therefore have a basis to go forward – that students do at least use technology, value it and go beyond what they are formally required to do. This in itself, of course, does not necessitate a revolution, so let us examine some further areas under the general 'net generation' research.

Lack of relevance

Having established that students seem to value ICTs, we could ask the same of educators. Here the picture is less clear, and Czerniewicz and Brown (2008) found that unlike students, staff

> didn't know whether or not their colleagues thought computers were important. When they did report knowing about their colleagues use and attitudes towards computers, they were divided about their opinions as to their colleagues' values and use, indicating limited support networks and communities of practice.

There are some differences in the use of technologies across generations; for example, Oblinger and Oblinger (2005) report that 74 per cent of teenagers use instant messaging (IM) as a major communication tool compared with 44 per cent of online adults. Livingstone and Bober (2005) have similar differences in ICT competence, 'only 16% of weekly and daily user parents consider themselves advanced compared with 32% of children'.

Hartman, Moskal and Dziuban (2005) looked at reactions to online courses across three 'generations' and found that '[t]he Net Gen respondents were

disappointed; they perceived a lack of immediacy in their online courses and felt that faculty response times lagged behind their expectations'. The attitude towards online learning seems to change across the generations.

> Baby Boomers preferred some face-to-face encounters with their instructors; Generation X students reported substantial, pointless interaction in class, and the Net Gen students felt that the interaction mechanisms designed by their instructors were much less adequate than their personal technologies. (Hartman *et al.* 2005)

This would suggest that the net generation does have a comparison to make about interactivity that may be relatively new.

Roberts (2005) reports the findings of a survey which suggests that 'customization is central to the definition of technology for Net Geners. Technology is something that adapts to their needs, not something that requires them to change'.

There may be proxies that we need to examine for the alleged irrelevance of education; for instance, truancy rates are now at their highest levels in England (Lipsett 2008), and there is also an increase in the number of students suspended from schools (Curtis 2008).

These figures themselves are subject to much interpretation, and what they signify is even more ambiguous. Of course, none of these necessarily point to problems with education; it could be a result of social pressures, for instance, and even if it does relate to educational irrelevance, that does not entail that technology is necessarily the solution.

In conclusion, then, there is some moderate evidence that there are some differences in the expectations of net generation learners and possibly an increase in dissatisfaction with education. There is a question of whether these expectations are really unique to the net generation, which we will look at later.

Different attitudes

A Pew Internet report (Lenhart *et al.* 2008) on teens and writing points at some differences in attitude between generations. Parents believe that teenagers engage in more 'writing' than they did, but the teenagers don't perceive what they do as writing; they see it as communication or socialising. They distinguish between academic writing and informal communication using technology. They have found some use of technology to improve writing:

> Teens who communicate frequently with friends, and teens who own more technology tools such as computers or cell phones do not write more for school or for themselves than less communicative and less gadget-rich teens. Teen bloggers, however, are prolific writers online *and* offline.

- 47% of teen bloggers write outside of school for personal reasons several times a week or more compared to 33% of teens without blogs.

- 65% of teen bloggers believe that writing is essential to later success in life; 53% of non-bloggers say the same. (Lenhart *et al*. 2008)

Of course, this does not mean blogging *causes* them to write more, so making the non-bloggers to keep blogs would not necessarily improve writing – those who like writing and have an aptitude for it are likely to keep blogs.

Another area where there may be a difference in attitude relates to 'cut and paste' or plagiarism, with younger people seeing less of a 'crime' in relation to copying. Livingstone and Bober (2005) report that '[a]mong 12–19 year olds who go online daily or weekly, 21% admit to having copied something from the internet for a school project and handed it in as their own'. Comparative figures for previous generations who may have copied from text books are not available, however.

Again the evidence is weak to absent to show that there is a major generational shift here, but there does seem to be some hints at subtle differences regarding standard educational practice and the way technology affects this.

Overestimating skills

A common theme from a number of recent reports seems to be that far from being the tech-savvy, digitally immersed cyborgs portrayed in much of the literature, there are some relatively poor information skills amongst the net generation and a good deal of variance.

For example, Brown (2009) reports,

Recently, the Nielsen Norman Group study of teenagers using the web noted: 'We measured a success rate of only 55 percent for the teenage users in this study, which is substantially lower than the 66 percent success rate we found for adult users'. The report added: 'Teens' poor performance is caused by three factors: insufficient reading skills, less sophisticated research strategies, and a dramatically lower patience level'.

The Google Generation report produced by the British Library (Rowlands *et al.* 2008) also explored some of the myths and its findings are listed below:

1 Young people have a poor understanding of their information needs and thus find it difficult to develop effective search strategies.

2 As a result, they exhibit a strong preference for expressing themselves in natural language rather than analysing which keywords might be more effective.

3 Faced with a long list of search hits, young people find it difficult to assess the relevance of the materials presented and often print off pages with no more than a perfunctory glance at them.

And as Livingstone and Bober (2005) state,

Many children and young people are not yet taking up the full potential of the internet, for example, visiting a narrow range of sites or not interacting with sites … 38% of pupils aged 9–19 trust most of the information on the internet, and only 33% of 9–19 year olds daily and weekly users have been taught how to judge the reliability of online information.

Bennett, Maton and Kervin (2008) provide an excellent analysis of many of the claims around the net generation and have found a similar pattern of overestimating the information skills of the young: 'These studies also found that emerging technologies were not commonly used, with only 21 per cent of respondents maintaining a blog, 24 per cent using social networking technologies, and 21.5 per cent downloading podcasts.'

This leads onto the next point about the net generation literature, which is that it makes claims of generational difference with little basis.

Seeing difference where there is none

Some of the net generation literature seems to make claims of supposed generational difference when none exists. For example, multitasking is often set forward as a new 'skill', but Bennett *et al.* (2008) respond that 'there is no evidence that multi-tasking is a new phenomenon exclusive to digital natives. The oft used example of a young person doing homework while engaged in other activities was also applied to earlier generations doing homework in front of the television'.

And Oblinger and Oblinger (2005) claim as one of the defining characteristics of the net generation that 'they want parameters, rules, priorities, and procedures … they think of the world as scheduled and someone must have the agenda. As a result, they like to know what it will take to achieve a goal. Their preference is for structure rather than ambiguity'. This rather begs the question, 'was there evidence that previous generations had a stated preference *for* ambiguity and chaos in their learning?'

Mark Bullen (Hanson 2008) makes a similar point about claims to the increased irrelevance of education to net geners: 'The relevance of education has been source of debate for as long as I have been in education. I remember, as a student, participating in a "walkout" from my high school in 1970 over the perceived irrelevance of our education.'

And while we may point to factors such as an increase in truancy to support the claim that school is seen as irrelevant, similar angst was to be found about truancy rates in1908 in New York (*The New York Times* 1908).

One issue is that people are often making claims when we have no comparison to judge them against. We don't know if students today are less satisfied with education than, say, 40 years ago, and even if we did, assigning causality would be difficult – it could be the result of massive expansion in higher education, for example.

One of the conclusions we may reach is that differences *within* generations seem as great as those between them. For example, compare responses of the young to the general population in the OCLC (2007) survey in which college students and members of the general public were asked the following question: 'How likely would you be to participate in each of the following activities on a social networking or community site if built by your library?'

The numbers are those who say they are *extremely likely* or *very likely* to do so (general public responses in brackets):

- self-publish creative work: 7 per cent (6 per cent)

- share ideas with/about library services: 10 per cent (7 per cent)

- share your photos/videos: 7 per cent (6 per cent)

- participate in online discussion groups: 6 per cent (6 per cent)

- meet others with similar interests: 6 per cent (7 per cent)

- describe your own personal collections: 9 per cent (6 per cent)

- view others' personal collections: 12 per cent (6 per cent)

Of course, the students could be objecting to the 'built by your library' element of the question, not the tasks themselves, which they might happily perform in Facebook, but the differences between the usually younger students and the general population are not significant.

There are, however, changes which we might attribute to the digital age that seem to be cross-generational; for instance, there seems to be a general decline in the amount of literature reading (NEA 2007). This may have a greater impact on the younger generation, who may never develop reading skills, but it does not necessarily separate them out from other generations.

Overall, as Bennett *et al.* (2008) suggest, there is little strong evidence for the main claims of the net generation literature, which they summarise as follows:

1 Young people of the digital native generation possess sophisticated knowledge of and skills with information technologies.

2   As a result of their upbringing and experiences with technology, digital natives have particular learning preferences or styles that differ from earlier generations of students.

However, for education it may not matter if this is a generational or a societal shift. If *everybody* is changing their behaviour, then education still needs to respond. 'Mature' students now exceed those in the traditional age range of 18–22 in the United States (Morrison 2003). So in this respect the net gen discussion is something of a red herring. What we need to be concerned about are the changes in the digital *society*.

People are learning in different ways

If the focus is less on the net generation, but with changes in society as a whole, then there is a need to look beyond students in formal education. First, some broad statistics of internet usage, which may relate to learning, starting with the behemoth of the Internet: Google. Statistics vary, with one report stating that in December 2009, Google was accounting for 87 billion search queries out of a global total of 131 billion (Comscore 2010).

Obviously, these searches are not all related to learning, and when they are, it may be learning at a very cursory level. In 2007, 55.6 million of these searches were referrals to Wikipedia (Schutz 2007), which hint at a greater depth of learning, at least that level of interest we see when people consult an encyclopaedia. If we take Wikipedia as the exemplar for online information resource, then at the time of writing it had 3,541,655 articles in the English version (http://en.wikipedia.org/wiki/Wikipedia:Statistics).

If Facebook is taken as the representative for social activity online, then, reportedly, there are more than 500 million active users; the average user has 130 friends; 50 per cent of users update their statuses at least once each day, and there are more than 900 million objects people interact with (web links, news stories, blog posts, notes, photos etc.) (http://www.facebook.com/press/info.php?statistics).

And lastly, YouTube as an example of new content creation. In June 2008, 91 million viewers watched 5 billion user-posted videos on YouTube, and 1–10 per cent YouTube users are creators (http://www.comscore.com/press/release.asp?press=2444).

This indicates a scale of activity online that has at least some passing relevance to education. Of course, none of this tells us much about how, what, or if people are learning. It is difficult when dealing with such global statistics to appreciate what they mean and how far we should be guided by them. But it is possible to at least conclude that there is significant activity online across a range of society, and the

intersection of these activities (socialising, sharing, content creation, information seeking) has a direct relevance to education.

Interpreting these statistics in terms of educational change is difficult – do they point to the need for total revolution or merely that an adjustment such as a social network for students might be a useful addition to a virtual learning environment (VLE)? There is a need to explore beyond the headline statistics, to look at some more specific examples.

Meeting unmet needs of learners

One claim often made is that higher education has a necessarily limited curriculum and that in a digital society we will see a liberation of the topics people want to learn about. For instance, here I am (Weller and Dalziel 2009) making reference to the long tail:

> [A] distributed model of learning design production is the best way to attack the long tail (Anderson 2006) of possible learner interests. If a user wants to find small courses to formally accredit their understanding of highland knitting patterns, history of Sydney in the 1960s or anthropology amongst football fans, then most current formal providers will not meet their requirements, but a sufficiently distributed pool of user generated designs might.

Getting any general statistics to support this, beyond those in the previous section, is difficult. But we can look at some examples and make extrapolations; for example, Griffiths (2008) details how YouTube is being used by graffiti artists to share techniques and also create social norms. This is not likely to be a subject or skill taught in any conventional sense, and yet the peer assessment, commenting and reflection shown by participants map onto the types of behaviour we foster in formal education.

And similar examples can be found for almost any topic one could think of, ranging from knitting (e.g. http://www.ravelry.com, http://www.knittingdaily.com) to running (http://www.runnersworld.com, http://www.fetcheveryone.com). Closer to formal education, there are sites such as PhysicsForums, which is an informal space to talk about science, maths and physics and has more than 100,000 members.

Perhaps the most highly developed and relevant area of interest is that of Free/Libre Open Source Software (FLOSS) communities. From surveys of open source participants (Ghosh *et al.* 2002), it is known that the desire to learn is a key motivational factor for participating in FLOSS projects. The manner in which FLOSS communities operate demonstrates many of the educational characteristics educators hope to realise, including mentorship, communities of practice, learning by doing and self-directed learning.

Participation in FLOSS activities is also an example of bridging the gap between formal education and informal learning. Ghosh *et al.* (2002) also report that four-fifths of FLOSS community members are convinced that proven FLOSS experience can compensate for a lack of formal degrees, and three-fifths consider the skills they learn within the FLOSS community as core skills for their professional career.

Perhaps, because they have been around for some time and have a robust reputation, we can also see from FLOSS some of the potential threat to formal education. In another survey, Ghosh and Glott (2005) found that except for other forms of self-study, which are performed by 58 per cent of the community members, the most common ways to learn are those that provide the opportunity to either read or work on the code and that depend on internet-based technologies. Participating in training courses is the learning approach with the lowest uptake.

Clearly there are a wide range of interests out there that are uncatered for in traditional education, and while this may have always been the case, we can see that the Internet is enabling communities to form, which would have been previously limited by geographical factors, and the removal of these barriers has seen an unprecedented growth in communities for whom learning is a key objective.

Open education

The area where these changes find greatest expression in education is that of the open education movement. This seeks to make educational content freely available to all, through the advent of open educational resources (OERs) such as MIT's Open CourseWare and the Open University's (OU) OpenLearn projects. We will explore these and the changing nature of openness in education more fully in Chapter 9, but for now they can be taken as a signal of a potential shift in educational practice, driven largely by technology. There is also a move to make academic journals 'open access' so they are freely available, which is covered in Chapter 12. All of this can be seen as part of a broader trend and philosophy of the Internet, which sees openness as a key to technical development and social acceptance. The use of open APIs in many so-called Web 2.0 sites has allowed others to develop a range of software that interact and build on their core functionality, as seen with the proliferation of Facebook and Twitter applications. The general philosophy of the blogosphere and those who spend significant time online is to be generally open in terms of disclosure and sharing content. Of the top 10 sites in the world (Nielsen 2010), 3 are based around the public, or semi-public, sharing of personal content and information (YouTube, Facebook and Wikipedia), the others being search or mail related, with social media accounting for 22 per cent of all time spent online. In this respect, the open education movement can

be seen as a response to, or at least as part of, a broader social change made possible by digital technologies.

The OER movement was begun in earnest by MIT's OpenCourseWare (OCW) project, launched in 2002, with the aim of making the whole of MIT's curriculum freely available. The site has more than 1 million visitors a month, the majority (41 per cent) coming from North America, although there is global usage, and self-learners represent the biggest group of users (Carson 2005). These are respectable, if not spectacular, figures when compared against the global population involved in education (132 million tertiary students worldwide in 2004).

The OU's experience with the OpenLearn project was that in the two years from the start of the project it had more than 3 million unique visitors, was accessed by more people (69 per cent) from outside the United Kingdom than within, 35 per cent of visitors returned to the site and 50 per cent of repeat visitors were 'new to the OU'. The project did not seem to affect core business; indeed there is some evidence that it helped recruit new students to formal courses, with at least 7,000 people registering on OU courses in the same online session that they were on the OpenLearn site (McAndrew *et al.* 2009). They also reported some evidence that the concept of openness was difficult to get across, and many users didn't believe (or appreciate) that this was free content.

The OER movement has grown quite rapidly from MIT's first venture; in January 2007 the Organization for Economic Cooperation and Development (OECD) identified more than 3,000 open courseware courses available from more than 300 universities worldwide (OECD 2007), although, as the report recognises, the sustainability of these projects is still an issue.

While the movement from within education has met with some success, commercial sites for sharing have often been far more successful. For example, the site for sharing and embedding presentations, http://www.Slideshare.net, has considerably more traffic than the MIT OCW site (http://compete.com/, February 2009).

The open education movement is still in its relative infancy, and so if it hasn't seen the widespread disruption to higher education some had hoped for, we shouldn't be too surprised. Education, as we know it today, has had several hundred years to develop the lecture-based model, so to expect an open model to radically alter this in just a few years may be expecting too much. There are a number of habits that will take some time to alter; for instance, educators are beginning to use a range of third-party material in their lectures (Flickr pictures, YouTube videos, OERs etc.), and so the 'market' for reusable content is growing. But suggesting that change *may* come is different from arguing that there is an urgent demand which universities have to meet, or else they will find themselves irrelevant to society. In the OER movement, it is probably fair to say that they are leading the thinking and development of concepts about free education, not responding to a social demand.

Lessons from other sectors

Chapter 3 will look at similarities and differences between higher education and other industries, particularly newspapers and music, which have been profoundly changed by the arrival of new technology. The digitisation of content and its distribution via the Internet have seen a merging of previously distinct sectors; for instance, a computer company (Apple) has become the main music outlet (iTunes), broadcasters provide telecoms services (e.g. Sky) and vice versa (British Telecom), and newspapers host podcasts (Guardian Online). As higher education institutions seek to explore, and exploit, new technologies, some of this boundary confusion begins to be applicable in the education sector also. For instance, the OU produces a podcast that features in the iTunes top 10, Kansas State University professor Michael Wesch produces YouTube movies that are viewed by millions and many bloggers having subscription rates to rival those of satellite TV channels (e.g. Stephen Downes has more than 10,000 hits per day). All of these are outside of traditional academic outputs, that is, courses, books and journal articles. The reverse is also true with YouTube, Google, Sky and the BBC, all engaging in activity that has some bearing on education, and a number of smaller start-up companies (e.g. TeachThePeople, SchoolForEverything) offering services on informal learning.

The result is that boundaries between sectors are less clear cut and more permeable than they once were.

Conclusions from the evidence

In this chapter, several contributing factors to the claim that higher education needs to undergo a radical change have been examined. We can look at each of these and state the overall strength of each argument.

A new generation is behaving fundamentally differently – there seems little real evidence beyond the rhetoric that the net generation is in some way different from its predecessors as a result of having been exposed to digital technologies. There is some moderate evidence that they may have different attitudes.

There is a general change in society which has relevance for learning – certainly the overall context is an ICT-rich one, and people are using the Internet for a variety of learning-related activities.

People are learning in different ways – although firm evidence of informal learning is difficult to gather, there is much by the way of proxy activity that indicates this is the case.

There is growing dissatisfaction with current practice in higher education – there seems little strong evidence for this. Probably more significant to the culture of education has been the shift to perceiving the student as a customer. There is

certainly little evidence that the dissatisfaction is greater than it used to be, but what may be significant is that there are now viable alternatives for learners. Universities have lost their monopoly on learning, which reinforces the next point.

Higher education will undergo similar change to that in other sectors – there are some similarities between higher education and other sectors, such as the newspaper and music industries, but the differences are probably more significant. However, the blurring of boundaries between sectors and the viability of self-directed, community-based learning means that the competition is now more complex.

It is possible, and at times tempting, to see these complementary factors as some kind of 'perfect storm' brewing for change in higher education. It is convenient for many who seek to implement change in higher education (for a variety of reasons) to portray it as an inevitable force that cannot be resisted or is resisted at the peril of higher education's continued existence. This may account for why the net generation literature has been so widely accepted – it creates a convenient backdrop against which to paint the need for radical change.

Having reviewed the evidence the claims for a perfect storm seem to be exaggerated, *but* there is a gathering of significant trends which higher education should seek to address. Undoubtedly the proclamations of the imminent demise of higher education are overblown; even if higher education did nothing, it would not see the rapid change in its practice that we have seen in other sectors. Rather we should see the response to these trends as having two main arguments:

1 Maintaining relevance – whilst the strong claims for the loss of relevance of higher education are not justified, there are some significant factors above, and just as higher education responds to any significant cultural change, so should it respond to these.

2 Opportunities – rather than portraying the digital culture as an impending threat to higher education, the only option being to adapt or die, it is more fruitful to perceive it as an unprecedented series of opportunities. The manner in which we have conducted scholarship has often been restricted by physical factors, and the removal of many of these should liberate both how and what we do as scholars.

An appropriate response

One possible conclusion from this might be that scholars should be cautious in their adoption of new technology and approaches, until we have the firm evidence that it is required or necessary. I think this is to misinterpret the role of scholars and to underestimate the potential significance of such approaches for our own practice.

There are several reasons why it is important to engage with a digital, networked, open approach, even if the urgent survival of higher education isn't one of them. The first is that there is lag between society's acceptance of a technology and then its adoption in higher education. Brown (2009) suggests that in society the stages of technology diffusion can be defined as *critical mass* (ownership by 20–30 per cent of the population), *ubiquity* (30–70 per cent) and finally *invisibility* (more than 70 per cent). If higher education were to wait for the invisibility stage to be reached *before* it engaged with a technology, then given the time it takes to implement policies and technology, it really will look outdated. For example, in 2007, those using social networks might have been in the minority; now they will be in the majority. This is the problem with waiting for data to determine decisions – if you made a decision based on 2007 data that social networks were largely unused, it would look out of date in 2010. What is significant is the *direction* of travel, not the absolute percentages at any given time.

Part of the role of education is to give students relevant skills, and by using a range of technologies for academic (rather than purely social) purposes, it could be argued that it is fulfilling this remit for the graduates who will then enter the workplace.

The second reason why scholars need to continue to engage with technology relates to pedagogy. Part of the role of educators is to assess which of these technologies will be significant, both in terms of students' lives (therefore, they represent a means of us reaching out) and also educationally, therefore, providing a means of utilising technology to improve education.

The wiki is a good example; scholars shouldn't be using wikis because they believe there is a Wikipedia generation and it will make them look relevant but rather because they allow them to achieve certain goals in teaching.

The next reason is that if technology isn't itself the cause for revolution, it is the enabler for maintaining relevance in a competitive market. The reasons students select universities are varied: when it comes to choosing a university, it seems that course suitability, academic reputation, job prospects and teaching quality are the main factors influencing prospective students (Soutar and Turner 2002). Non-academic factors also play an important part, including proximity to their homes, availability of scholarships and teaching and the range of non-academic student services (Drewes and Michael 2006). Students from low-income families will be influenced by financial factors, such as cost of living in the university locality and employment prospects (Callender and Jackson 2008).

It is notable that 'technology usage' is not listed amongst these. Students don't *choose* a university based on the particular VLE it deploys, but the use of new technologies will have a direct impact on many of these other factors. For instance,

the range of courses and student satisfaction will be influenced by the deployment of innovative technology by educators.

The final reason is that of exploration and professional reinvention. The reason educational technology seems more prevalent, and indeed urgent, now is that we live in an age when the quantity of tools that can be put to a pedagogic use is at an unprecedented level and the rate of release of these is increasing. Just as significantly, as I argued in Chapter 1, many of these are free and easy to use. Thus, their adoption carries a much lower risk than with previous generations of technology. The opportunities for experimentation and finding new ways of teaching a subject, or engaging in research or disseminating knowledge, are therefore much richer and, given the ease of use, greatly democratised.

Conclusion

The evidence for radical and imminent revolution in higher education may not be as strong as I once liked to believe, but we shouldn't ignore the fact that there are also some very significant trends which are founded on data and research and not just on anecdote and rhetoric. These suggest very strongly that the engagement with new technologies is a core practice for higher education.

And more significantly, these trends indicate that we have a richer environment in which to explore changes in teaching and learning practice. We have a convergence of a base level of technological competence, an expectation of the use of ICTs in education, a range of easy to use tools and models from other sectors to investigate.

So while the absolute necessity for radical change is overstated, there are unprecedented *opportunities* for the use of technology in education. And as educators we shouldn't need to wait until the case has been proven for each one to try it because, as the saying goes, it doesn't take a whole day to recognise sunshine.

Chapter 3 will explore the impact new technologies have had on other sectors in more detail and look at what lessons might be drawn for higher education.