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14 Digital Resilience

The concluding chapter of this book aims to draw out some of the themes that have recurred and to address the context within which the impact of a digital, networked, open approach will exist. One such theme is the reluctance of scholars to adopt some of the new practices now afforded to them, and particularly some of the anxieties surrounding these are examined first of all. It is proposed that this has previously led to a failure of ownership over some key scholarly practices which have been grounded in technology. The solution to this is not resistance but engagement with technology and reflection on changing scholarly practice. Different types of engagement are then delineated, and resilience is proposed as a means of considering the core scholarly practices. Such engagement is both necessary and possible, I contend, because higher education has within it the ability to disrupt some of its own practice without undermining its own economic basis.

Techno-angst

There is often some anxiety, resistance or scepticism around the adoption of new technology and related approaches. As mentioned in Chapter 13 there is a danger of extremism in these attitudes, which are either dismissed as people ‘who don’t get it’ or, conversely, as technology fetishism lacking in critical reflection. I am in agreement with Lanier (2010) when he argues that ‘technology criticism shouldn’t be left to luddites’, but the reverse is also valid, in that technology engagement shouldn’t be left to the evangelists.

One theme of this book has been the relative reluctance of academia to engage with new technologies or to change established practice, for example, the lack of uptake by researchers covered in Chapter 5. I have suggested some reasons for this, including the impact of the reward and tenure process, the nature of research practice and the established communication channels. But a more general psychology may also be at work, which is worth considering.

For the title of one of his novels Martin Amis (2010) borrowed from this Alexander Herzen quote:

The death of contemporary forms of social order ought to gladden rather than trouble the soul. Yet what is frightening is that the departing world leaves behind it not an heir, but a pregnant widow. Between the death of the one

and the birth of the other, much water will flow by, a long night of chaos and desolation will pass.

In his novel, Amis is writing about the sexual revolution of the 1970s, but I suggest the same can be applied to the digital revolution. This is what causes so much angst in the popular media and amongst society in general. We can see what is passing, but what is forming is still unclear. Clay Shirky (2009) talking about newspapers puts it thus:

So who covers all that news if some significant fraction of the currently employed newspaper people lose their jobs?

I don't know. Nobody knows. We're collectively living through 1500, when it's easier to see what's broken than what will replace it. The internet turns 40 this fall. Access by the general public is less than half that age. Web use, as a normal part of life for a majority of the developed world, is less than half *that* age. We just got here. Even the revolutionaries can't predict what will happen.

We can think about some general directions of travel, we can make some guesses, and most of all, we can experiment. The focus of this book is what the changes mean for scholarly practice, how will academics perform research, what will education look like twenty years from now, how can we best be engaged in public debates? We have a very well-established set of methods for all of these currently, but it is unlikely that any of them will remain untouched by the impact of a digital, networked, open approach. And as with other industries we saw in Chapter 3, trying to find ways to preserve them as they are, or with a digital veneer, won't be sufficient when others find innovative ways to achieve the same ends using new tools.

As Amis puts it in his novel, 'it was a revolution. And we all know what happens in a revolution. You see what goes, you see what stays, you see what comes.'

What goes, what stays and what comes – each element of this trio is significant. Often we concentrate on 'what comes', but it's just as interesting to consider what stays. This reveals what is important to us (will journalism stay? will universities stay?) or at least what is so ingrained culturally or commercially as to be immovable. The QWERTY keyboard has stayed thus far in the digital age, despite being an analogue solution, not through any sense of value but because it was too entrenched to overthrow.

What goes is equally revealing because it demonstrates that practices and values that we may have seen as unassailable are suddenly vulnerable because the assumptions they are based upon are no longer valid. The scarce, rivalrous nature and distribution model of many goods and content is one such example. When they

became abundant, non-rivalrous and freely distributed, whole industries began to look weak. The 'what goes' element may also reveal to us what was important and not so important after all.

We generally assume that after a peaceful social revolution the resulting practice is an improvement for the majority of people; otherwise it wouldn't occur. Unless the revolution is imposed upon the people, the general direction will be towards a utilitarian improvement. But this doesn't mean the post-revolutionary world will be better for everyone. There are those whose profession and identity will be strongly allied to the existing practices. There will be practices and values that are lost that we find we did in fact hold dear but which were too closely attached to the older methods to survive. In short, there will be winner and losers. A revolution may be bloodless but is rarely painless for all.

This is why we see scare stories about games damaging children's health, social networks ruining the nature of friendship, piracy killing artistic endeavour or the fabric of society being damaged irrevocably by a general addiction to computers. We are learning what role these new tools play in our lives, and there will inevitably be mistakes, misapplication, overuse and correction.

If we have the triumvirate of what comes, goes and stays, this may also explain some of the reluctance to change existing practice. Kahneman and Tversky's prospect theory (1979) sets out the different evaluations we have of loss and gain. The two are not weighted equally by individuals, with loss-aversion being more psychologically important than possible gain. While we are in this period of transition, it is not entirely clear what it is that will be gained, and even if cogent arguments are made for benefits, these gains may still not be sufficient to outweigh the psychological risk-aversion to the possible losses. The gain of new methods of communicating and working are not perceived as sufficient to overcome the potential pain of losses. We tend to exaggerate the feeling of loss, so changing scholarly practice highlights the potential of losing authority, for example, by undermining the peer-review process, weakening the higher education system by offering the components separately or losing some ownership by releasing content under an open licence. The possible (if not probable) losses are more palpable. This emphasises the significance of framing, of placing both the benefits and losses in an appropriate perspective, which I will return to in the section on disruption.

The impact of technology on society in general is something we are only beginning to appreciate. The world my daughter will inhabit is likely to differ from the one I know more significantly than the one I grew up in compared to my parents. Who can predict how these changes will affect her professional and social life? In Chapter 2 I suggested that the prophecies about the impending irrelevance of universities were overblown, but we can recast these prophecies in terms of how

scholars can change their own practice. Without addressing some of the issues set out in this book, scholars may find themselves excluded from discussions in the wider social network, their work hidden away in obscure repositories and their research ignorant of social issues. This would be the real tragedy of scholars, even if they continued to be successful in terms of employment and research funding.

When Wikipedia founder Jimmy Wales gave a talk for the Open University conference I said that as a father of an inquisitive eight-year-old, not a week went by when I didn't give thanks for the existence of Wikipedia. He responded that it was a double-edged sword; when he was young his father could give him an answer and he'd accept it, but he found now that his kids were back-checking his answers on Wikipedia. There was no getting away with fabricating answers anymore. This small example seems to encapsulate much of the challenge facing scholarship – some things are coming and some are going, and we don't yet know how significant these will be, but key to the successful implementation of changes, or appropriate continuation of current practice, is a sense of ownership over them, which is the subject of the next section.

A failure of ownership

Academics should not be passive recipients of this change. If we, as scholars, truly believe that some elements of a digital, networked, open approach will harm some core functions of scholarship, then the correct response is not to decry the new approach and retreat, it is to engage and determine for ourselves how these functions might be preserved. For example, if peer review is deemed essential then scholars can construct methods of achieving this which utilise the technology to the improvement of the process. An insistence on maintaining the current model, with the current journals, and denigrating the new models runs the risk that research is out of date and hidden away. Or worse, it allows others to control the process because scholars deem it too complex or not their domain. The solution provided then will not be suited to their needs but to those of external agents.

I would argue that this has happened to a significant extent in academia already, particularly where technology has played a key role. Inevitably this has meant academia have outsourced functions to for-profit companies. There is nothing intrinsically wrong about the involvement of for-profit companies with scholarship; it is often a mutually beneficial relationship. But for complex activities that go to the heart of scholarship, once they were outsourced then academia became reliant on them and effectively lost control. Here are three examples of this in action:

- 1 LMSs/VLEs – the central role that elearning would come to play in teaching was underestimated by many academics, and so simple solutions were

sought. The commercial VLEs offered this, but this has seen increasingly costly contracts, an attempt by the company Blackboard to patent many of the core concepts in elearning, and in general a reliance on commercial providers to lead development. Once a VLE becomes embedded in practice with all the requisite staff development programmes, policy guidelines and links to university systems, then it becomes difficult to dislodge.

- 2 Tenure, assessment and publications – as discussed in Chapter 11, one view of the promotion system is that the complexity of measuring excellence in different fields was effectively outsourced to the peer-review process. This placed publishers in a central position in academia, since they controlled the routes to career progression. Related to this was the manner in which scholars ceded control to various initiatives which sought to quantify the quality of research. This reinforced the publishers' position since their journals were linked directly to institutional funding.
- 3 Publication – as addressed in Chapter 12, many professional societies and university presses handed over their publications to for-profit publishing firms, effectively outsourcing the process, the proceeds of which they would then have to buy back.

George Siemens (2010) has argued that academia should take ownership of the open education debate before it is hijacked, and given the above history, I would agree.

The loss of ownership of some of these core academic functions occurred not because of the technology but rather because the scholarly community failed to engage with it. Large-scale open source projects could have solved many of these problems (and in cases such as OJS and Moodle have been successful), and the overall cost to universities would have been much less than being in an unequal relationship with commercial companies for whom scholarship is not their primary interest.

Commercial partnerships in education can be very fruitful, and academia is not always best placed to develop or innovate in technology. Many of the popular free services are undoubtedly better, or exist at all, because they were developed by commercial operations (imagine an academic Flickr or YouTube), but we should be aware of what it is we are handing over. As we face the question of 'what do we do about Web 2.0/cloud computing/social media?' a full understanding of what it can do is essential, and simply handing over the problem to someone else will not serve us well.

A potential nightmare scenario for many involved in scholarship is what we might term the 'Googling of higher education'. In this scenario, libraries, and in particular the human expertise of librarians, are replaced by digital copies of all content, with efficient data and search mechanisms. Teaching is replaced by automatically

generated 'playlists' of open content. Accreditation of learning is performed by metrics and scores which are too complex to cheat or game. The only research that gets funded is that which offers commercial incentives, and its merit is judged by the number of hits the results generate.

This is maybe a bit far-fetched, and there are a number of external factors which would mitigate against it. But it, or a flavour of it, is not beyond the realms of possibility.

One response to this might be to resist, adopting the exact opposite of many of the approaches proposed in this book. There is a strong logic to this – if scholars don't make research and teaching content available, then Google can't sweep it up. The danger of such an approach is that if this content is made available by other means (maybe by academics in different countries who sign a deal with Google or by non-academics) then scholars lack any position of power and, worse, sufficient knowledge of how to compete.

Back in 1998, when elearning was new, critics such as David Noble (1998) argued that it was part of a process of commercialisation and commoditisation of higher education. While there was more than a touch of anti-technology sentiment about Noble's argument, some of what he predicted has come to pass. He argued 'universities are not simply undergoing a technological transformation. Beneath that change, and camouflaged by it, lies another: the commercialization of higher education. For here as elsewhere technology is but a vehicle and a disarming disguise'.

Quite rightly he suggested that this should be resisted. In this sense resistance meant not engaging, withdrawing cooperation, refusing to put course notes online and engage with technology. One could argue that the result was that the commercialisation of education did indeed occur, but not because academics went along with it unwittingly but because insufficient numbers engaged with the technology itself.

Levels of engagement

So what does engagement with technology mean? First, I would suggest, it acknowledges that the changes afforded by new technology are not peripheral but fundamental to all aspects of scholarship. Then there is engagement at a number of levels to be considered. This is not intended as a manifesto or a manual, but the following suggestions demonstrate the type of responses scholars might undertake once the first principle is accepted, which would address the ownership and engagement issues. Such strategies can be considered at four levels:

- 1 governmental and funding body
- 2 institutional

3 disciplinary

4 individual

Governmental and funding body level

For those at the most strategic level of governments, funding bodies, national policy and so on the scope for influence is considerable. Most research funding flows from such bodies, and so legitimisation of other forms of impact beyond conference papers and journal articles is one way of encouraging engagement with new communication tools. But the strategy could go much further than simply making the use of new tools a desired element in any bid, and a more radical rethinking of both the bidding process and the type of research that is funded which fully utilises a digital, networked, open approach is possible. One of the themes of this book has been how new technologies offer alternatives to existing methods, but the onus is on practitioners to examine current practice and explore how these alternatives may be realised.

For example, most research is structured around medium- to large-scale projects operating over a two- to three-year time scale. Such projects are constructed around milestones, work packages and deliverables. There is a great deal of effort and time involved by all parties at every stage of this process: creating the initial call, preparing and costing a bid, evaluating proposals, allocation of funds, managing a successful project, reporting, monitoring and independent evaluation of the project once it has completed. Such large-scale projects are indeed necessary for much of the in-depth research in scholarship. But the process is also a product of the tools we had available. A research funding approach which had digital, networked and open as its main characteristics may look different. For example, if the granularity of research becomes smaller (or at least more variable), as suggested in Chapter 5, then such a top-heavy approach will struggle to accommodate this. An alternative might be a shift in emphasis to more fellowship-based approaches, rather than project-based ones, where an individual with a digital, networked identity is given funds to explore a particular theme. One of the benefits of an open approach is that a significant quantity of data is already available, as are a wide range of tools, so for some research subjects, the cost of equipment and data gathering are not great, and exploratory research performed by an individual is a more fruitful approach. More radically, research funding could be realised through micropayments, based on *post hoc* recognition of shared outcomes, that is, a research group or individual gets small payments after they have published a small piece of research. Funders might also look to create research outcomes as the aggregations of a network of individuals and not just the outputs of large formal groupings.

Undoubtedly there is research that will always require the large funding model as we currently know it to exist (this may be particularly true in the sciences), and I do not suggest that any of the alternatives sketched above are superior. What they demonstrate hopefully though is that there are different models of how research can be funded, recognised and disseminated, which national and international bodies could explore.

Institutional level

At the institutional level the first task is to recognise the issues set out in Chapter 11 regarding the recognition of digital scholarship. While reward and promotion are not the sole motivation for academics, failure by institutions to recognise them and to promote established practices sends a clear message which does not help to create an innovative environment.

In conjunction with recognition is facilitation. Each institution will need to determine what, if any, the benefits will be if academic staff become active digital scholars. For example, it may be seen as a route to public and community engagement, as a means of rejuvenating the curriculum or of raising the profile in particular research disciplines. It is not, however, a shift in practice that will occur overnight, and so if there are perceived institutional benefits then investment in developing the appropriate skills will be required some time before these benefits can be realised. This does not necessarily mean a range of training courses (although some may opt for this), but for instance, it could be realised through an allocation of time to explore new technologies, similar to Google's 20 per cent time, where staff are allowed that allocation to work on projects outside of their normal remit, but which might be of interest (to them and Google). This removal of emphasis on deliverables and reporting creates an environment where people are perhaps less fearful of failure, and as anyone who has experimented with using new technologies can testify, failure is a certainty at some stage. Other options might be to reward and publicise the most innovative use of technology in teaching or to regularly share informal outputs such as blog posts and videos in an internal forum. The methods are varied, but the aim is similar – to turn technology engagement into a virtue.

Discipline level

At the level of a particular subject discipline or community, a combination of the previous two approaches might apply, with recognition and encouragement of new forms of output as well as supportive research funding. In addition it is at the disciplinary level that much of the knowledge exchange occurs, so there is an opportunity to nurture new forms of this, particularly, for example, in the case of conferences. As proposed in Chapter 10, the bottom-up adoption of technology by participants is beginning to

alter the nature of conferences, but in their format many are unchanged. In terms of disseminating knowledge the one-to-many lecture was a viable solution prior to the Internet, but it now seems like a misuse of the face-to-face medium. If you can easily broadcast the content online (e.g. through video, slidecast, blog posts, articles), then to spend much of the conference time replicating this function doesn't utilise the face-to-face interaction to its fullest potential. As covered in that chapter, a number of alternatives to the traditional conference have been attempted. The barcamp and unconference models have experimented with this, but this more fluid, practical or discussion-based approach has not been adopted widely in academic circles. At the discipline level then societies and conference organisers might be more experimental about the format of conferences. Some possibilities include the following:

- disseminating presentations online prior to the event as videos or slidecasts and then using the face-to-face segment for discussion;
- an open peer-review model where proposals or papers are debated and voted on for further discussion at the conference;
- practical sessions with the aim of producing a tangible output, such as a site, a learning resource, some code, a set of guidelines and so on;
- open presentation formats, for example, having to speak on a random subject for two minutes; and
- group formation about possible research topics, with the aim of developing a research proposal, to be shared back to the wider conference later.

As with the possible experiments with research models suggested previously, these need not completely replace all existing conferences or presentations, and many might be unsuccessful, but few disciplines are exploring the possibilities that are now available.

Individual level

Finally, at the level of the individual scholar, the actual approaches and technologies used will vary depending on preference, role, purpose and ability, but I would suggest that taking the role technology can play in transforming practice seriously is important. This will require engagement with technology and, perhaps more significantly, reflection on practice. The technologies that underpin the digital, networked, open approach are too prevalent and significant to be dismissed as stuff for techies – what I have tried to demonstrate in this book is that they can impact upon all aspects of scholarship. So just as a scholar is willing to commit time to aspects of scholarship for which there may be no direct outcome, such as

reviewing articles, preparing research bids, attending seminars, so allocating some time to exploring a particular technology with the aim of integrating it into scholarly practice can be seen as a legitimate and necessary task. Creating the space for this is undoubtedly difficult, and it is why technology is often seen as yet another burden piled onto the academic. One way to make this space is to use formal recording mechanisms to raise its profile, for example, in an annual workplan to specifically allocate a number of days to a technology-related activity (e.g. 'starting a blog') or in research returns to record other outputs as measure of impact (e.g. '3,000 views of this presentation'). These may well be ignored, but by formally recording them individuals can raise the significance of digital scholarship in their practice and also create a discussion with the institution regarding its attitude and support.

The emphasis at all four levels should not be on the technology itself but on the approaches the technology now facilitates and how these can improve scholarly practice. I would contend that engagement at all levels is necessary to create the environment within which scholarship continues to perform the functions we value. Any of the suggestions here, and many more besides, should be viewed as a means by which scholars can retain (and even regain) ownership of their own practice. This requires a strategy of resilience, which I will explore next.

Resilience

In his 1973 paper on the stability of ecological systems, Holling defined resilience as 'a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables'. It is a perspective that has been evolved beyond the ecosystems Holling applied it to and has found particular relevance to sustainable development and climate change. Hall and Winn (2010) have applied the concept of resilience to education and open education in particular. Walker *et al.* (2004) propose four aspects of resilience:

- 1 latitude: the maximum amount a system can be changed before losing its ability to recover;
- 2 resistance: the ease or difficulty of changing the system; how 'resistant' it is to being changed;
- 3 precariousness: how close the current state of the system is to a limit or 'threshold'; and
- 4 panarchy: the influences of external forces at scales above and below. For example, external oppressive politics, invasions, market shifts or global climate change can trigger local surprises and regime shifts.

This is a useful means of considering the response of academia to the potential impact of new technologies. This applies across all four of the levels given above, providing a ‘digital scholarship resilience matrix’ as shown in Table 14.1. Completing this is an exercise you might like to attempt for your own discipline and institution and relevant research council or agency. For each entry, attempt to match the level against the resilience factor, to provide an overall picture of resilience.

How you complete each entry will vary considerably depending on discipline (medical research, for instance, is arguably less precarious than historical research), geographical location (venture capital funding for technology research will be easier to come by in San Francisco), institution (Cambridge University is likely to be more resistant to change than a modern one) and recent events (universities in Ireland and Greece, for example, will be subject to the panarchic influence of recent years).

Building on Holling’s work, resilience is now often defined as ‘the capacity of a system to absorb disturbance and reorganise while undergoing change, so as to retain essentially the same function, structure, identity and feedbacks’ (e.g. Hopkins 2009).

It is this capacity to retain function and identity that is particularly relevant to scholarship. To return to my contention in the section on ownership, this does not equate to resistance. Indeed, a high resistance is not necessarily a benefit to an ecosystem, as Holling observed how some insect populations fluctuate wildly depending on environmental factors but overall they are resilient.

In terms of scholarship resilience is about utilising technology to change practices where this is desirable but to retain the underlying function and identity which the existing practices represent. It is a mistake to think of the practices *themselves* as being core scholarship, rather that they are the methods through which we realise them, and these methods can change. Peer review, for example, is a method of ensuring quality, objectivity and reliability. But it may not be the only way of realising this, or at least its current incarnation may be subject to change. A resilience

Table 14.1 Digital scholarship resilience matrix

	National agency	Discipline	Institution	Individual
Latitude				
Resistance				
Precariousness				
Panarchy				

perspective would seek to ensure these core functions were protected and not just resist at the level of the method.

As an example of resilience, I will take a rather prosaic example but one which reflects some of the anxieties and issues for an individual. One of the popular web 2.0 services amongst academics has been the social bookmarking tool Delicious. This allows users to easily tag and share bookmarks, so very quickly large resource collections can be built, which are open to all. In December 2010 Yahoo, who own Delicious, announced they were seeking to find a buyer for it. This caused much consternation amongst users, who began asking whether it would mean the end of Delicious, what would happen to their collections, what alternative tools were available and so on.

More significantly users began to wonder whether it signalled the death knell for cloud computing. If cloud services could not be relied upon should academics abandon the cloud altogether and rely on internally hosted solutions?

If one views this from a resilience perspective, the following responses seem appropriate:

- Use cloud solutions when they are best suited to the task. If the aim is to share content, to have it easily embedded, to be part of a wider community of participants, then cloud solutions are often ideal. It is possible for individuals to be open and digital by placing their presentations in their own database, but this lacks the network element, and services such as Slideshare offer a better option where more people will find them. If connections, views and ease of use are paramount, then the commercial cloud is a sensible option.
- Store locally, share globally. Placing content online doesn't entail surrendering it completely. Perhaps a reasonable assumption is that these services will disappear at some point, so a local store acts as backup.
- Find alternatives. One advantage of the cloud-based approach is that there are numerous services that perform the same function. When the news about Delicious broke many people looked for alternatives, for example, Diigo, and exported their bookmarks. The cloud itself offers a degree of resilience.
- Develop academic solutions. Academic projects don't always have a good track record in keeping things simple, but there are services that it may be useful to share between universities, such as storing research data in a specialised cloud. The Flexible Services for the Support of Research (FleSSR) project, for example, is exploring a hybrid of private and public

cloud solutions between universities “for the on-demand provision of computational and data resources in support of research” (<http://www.jisc.ac.uk/whatwedo/programmes/flexible servicedelivery/flessr.aspx>). There could be benefits in terms of efficiency, shared data and agreed standards for similar projects focused on very specific academic needs, which general cloud solutions do not meet.

- Accept that such services are temporary. Even if Delicious did close down (which doesn't seem to be the case), it has lasted seven years, giving users a service they wouldn't have had if they'd waited for an institutionally hosted version to materialise.
- Develop service-level agreements. This model accepts that some cloud-based solutions are viable, and the institution either pays for these or guarantees a number of users in return for a service-level agreement. This doesn't guarantee the durability of the providing company or that the services won't be removed, but it does provide a level of reassurance.
- Self-hosting. A range of open source and low-cost software options are available, which mean that individuals can host their own versions. For example, the blogging software Wordpress can be installed on individuals' server, which means they are not reliant on external services.

I would argue that an appropriate approach is not to retrench to solely internally developed systems, not to simply resist, but to engage in a resilient manner.

Room for disruption

In Chapter 3 some of the impacts of new technology in other industries were examined. While the lessons these sectors offer are instructive, it also provides a basis for considering in what ways higher education differs and thus may not be subject to the same influences. The major difference is that higher education is not purely a content industry. As I argued in Chapter 7, it *produces* a considerable amount of content, which could be distributed and shared digitally, but its revenue is not predicated on selling this content, unlike music or newspapers.

It is undoubtedly the case that the vast amount of online content means that people now conduct a lot of their learning informally, using free resources. Combined with financial pressures, this creates a pressure or an alternative competition for learning that is new to higher education. Anya Kamenetz (2010) details the convergence of these two factors in her book *DIY U*, arguing that ‘Do-It-Yourself University means the expansion of education beyond classroom walls: free, open-source, vocational,

experiential, and self-directed learning'. This certainly represents a challenge to the monopoly on learning that universities and colleges have held for centuries and one they should take seriously (through engagement with technology and approaches).

However, even in times of financial crisis higher education has a certain resilience for two reasons: the social value of formal education is often increased in times of financial hardship and learning is not a zero-sum game. It is this latter reason that I think is of real significance to higher education. Even if people are learning much of what they require via open, online resources mediated through their social network, that in itself can generate the desire for further learning and can generate interest in formal education. Competition with informal learning is true to an extent, but it presupposes a set amount of learning by an individual, as if they have a limited number of cognitive learning tokens to be used up in a lifetime. But it is more often the case that learning begets learning. In this respect open, informal education is complementary to formal education, indeed something of a gift, rather than a threat. In a world that generates vast amounts of niche content which people are increasingly engaged with, either through generating their own, sharing or discussing, the outcome is a larger population of active learners. A population of active learners are more likely to engage in formal study than a population of passive consumers.

The challenge for universities is to remain relevant to these learners. This means developing an appropriate curriculum, having flexible course options, using technology effectively and generating interest. An example of this symbiotic relationship would be between a photo-sharing service such as Flickr and university courses on digital photography. A great deal of informal learning occurs through the communities on Flickr, which can focus on themes or techniques, or the Daily Shoot site, which gives photographers a daily task to perform (<http://dailyshoot.com/>). At some stage though many photographers want to further their understanding or have a more structured approach and sign up for a course on digital photography. The Open University's short course in this area has been one of its most popular, which since 2007 has two presentations a year with between 1,000 and 1,500 students per cohort.

More radically, Jim Groom set up an open course on digital storytelling (<http://ds106.us/>), which combines learners from a global community with those based on his own campus of University of Mary Washington. Participants are required to create digital artefacts and to share these on their own blogs and sites, which are aggregated together on this course blog. The course is fluid, with participants suggesting assignments, and distributed across many sites, using the hashtag #ds106 to group content. It combined 32 campus-based students who are studying for credit, with more than 250 learners from a global community studying for their own interest, and even had its own radio station.

These two examples demonstrate how the open, informal learning which many people partake in online is not necessarily a threat to the existence of higher education and, given some adjustments by universities, can be a benefit.

There are two messages that higher education can take from this: the first is that it needs to engage in the sort of experimentation Jim Groom's course represents if it is to turn the digital, networked and open approaches of learners to its advantage; the second is that it has the capacity to do so.

It is this second message that marks another difference with the sectors reviewed in Chapter 3. Many of those industries did not have the revenue streams which come from accreditation and research funding to counter any loss of revenue from consumers finding alternative content freely available online. Higher education is in a position where not only does it need to disrupt its own practice but it can *afford* to. It has sufficient resilience to do so because unlike content industries, that disruption does not completely undermine its current model. In Chapter 7 I argued that higher education can be viewed as a long tail content production system, and with little effort much of what it produces could be shared as open, digital resources. Higher education can afford to do this because their 'customers' (if we use that term by way of analogy with other sectors) are not purchasing that content directly – they are instead students who are paying for a learning experience which comprises that content along with the other elements outlined in Chapter 3, most notably support, guidance and accreditation. Other customers include research councils, commercial partners, media, charities and governmental agencies. Again these customers are not directly paying for content, and with the exception of cases of commercial sensitivity and privacy issues, they often have much to gain from openness and wide dissemination.

Some of the concerns relating to the impact of new technologies in other sectors then do not apply in scholarship, or their impact is reduced. The concerns regarding how artistic endeavour is to be rewarded in a world where all content can be easily distributed for free are very real if you are a musician, for example. These concerns are not the same for academics, however, who are usually employed and so are not deriving their income from content in the same manner. This is not to underestimate the impact and challenges that face higher education, but to highlight that disruption by new technologically driven approaches is not as threatening to core practice as it has been in other sectors. This may account for why the innovation and adoption of such approaches have been less prevalent in higher education, since the urgency to respond is not as great.

Conclusion

In Chapter 2 I argued that some of the rhetoric about revolution in higher education was ill-founded. But that is not to say that considerable changes to practice are not

occurring and that education itself is operating within a broader social and economical upheaval driven by digital technologies. If a complete revolution in higher education is not necessarily imminent, this does not equate to a life of immutable practice either.

It is necessary to acknowledge then that the adoption of a digital, networked, open approach is not without its problems, and what is more we are at a stage when there is still considerable uncertainty as to how such approaches will affect scholarship. Higher education is facing challenges beyond technological ones as funding models and the role of education in society come under scrutiny. Technology should not be seen as a panacea for all of these issues, but also we should not romanticise some scholarly Camelot of yesteryear either.

If there is some room for disruption within higher education, then the kind of changes that are witnessed in broader society as a result of a global, digital network represent an opportunity for higher education. The first wave of user-generated content has largely focused on easy-to-share artefacts: photos, videos, audio. Having begun sharing, people are now constructing meaning around these, for example, the groups that form on Flickr. It is this next step, in using these artefacts to construct deeper knowledge, that higher education has a role to play. This can be in constructing an appropriate curriculum, developing tools and structure for facilitating this, generating outputs that can be used and researching how this type of knowledge construction occurs. Scholarship which met these challenges would be one that is not only of increased relevance to society but also a resilient practice.

This argument can be furthered by an example. Lanier (2010) argues against what he perceives as the prevailing wisdom around cloud computing in *You Are Not a Gadget*. The resultant disaggregation of our self is depersonalising, he suggests, and superficial (to echo an earlier objection). This is partly a result of the way the software is designed; for example, he argues that the sort of anonymous, consequence-free commenting on YouTube leads to the sort of negative ‘Trolling’ behaviours one often observes there. It is also partly a result of people lowering the behaviour to meet that of the software, for example, allowing the simple classifications of Facebook. This may not be true; a rich picture of someone emerges from their Facebook updates regardless of the simplistic classifications they start their profile with, but the perceived superficiality of much online discourse is often raised.

Lanier does not propose withdrawing from online environments as a solution but rather suggests some simple approaches to overcoming this depersonalisation:

- 1 Don't post anonymously unless you really might be in danger.
- 2 If you put effort into Wikipedia articles, put even more effort into using your personal voice and expression outside of the wiki to help attract people who don't yet realise that they are interested in the topics you contributed to.

- 3 Create a website that expresses something about who you are that won't fit into the template available to you on a social networking site.
- 4 Post a video once in a while that took you one hundred times more time to create than it takes to view.

Whether you accept Lanier's view, the suggestions above represent an example of how, having mastered sharing, there is a desire to utilise the possibilities for structured, thoughtful pieces, and higher education should surely be able to play a role in this.

In this book I have attempted to set out three themes: the changing practice that is occurring; the potential of digital, networked, open approaches to enhance scholarship; and the context within which this is taking place. This is a period of transition for scholarship, as significant as any other in its history, from the founding of universities to the establishment of peer review and the scientific method. It is also a period that holds tension and even some paradoxes: it is both business as usual and yet a time of considerable change; individual scholars are being highly innovative and yet the overall picture is one of reluctance; technology is creating new opportunities while simultaneously generating new concerns and problems. One should therefore be wary of any simplistic solutions and rhetoric which proclaims a technological utopia or equally dismisses technology as secondary.

In this period of transition the onus is on us as scholars to understand the possibilities that the intersection of digital, network and open approaches allow. If Boyer's four main scholarly functions were research, application, integration and teaching, then I would propose that those of the digital scholar are engagement, experimentation, reflection and sharing. It is the adoption of these functions that will generate the resilient scholarship of the next generation. For scholars it should not be a case of you see what goes, you see what stays, you see what comes, but rather you *determine* what goes, what stays and what comes.