



E-Learning and Social Networking Handbook

Resources for Higher Education



Robin Mason and Frank Rennie

E-Learning and Social Networking Handbook: Resources for Higher Education

Student engagement with digital learning resources and online social networking are strong forces in education today. How can these resources best be utilized by educators and course designers in higher education? This book aims to provide the reader with enough background information to appreciate the value of social networking, especially for distributed education. Through highlighting the most relevant, interesting and challenging aspects of e-learning the book provides practical advice for using social networking tools in course design. This volume covers the following issues of course design using social networking:

- Key issues of social networking as an educational technique
- Designing for a distributed environment
- Strengths and weaknesses of delivering content in various formats: text, audio and video
- Specific media: blogging, wikis, podcasting, webcasting
- Constraints on course design
- Implementation, evaluation, induction and training

Illustrated by short descriptive case studies, it also highlights contact addresses, websites and further reading to help readers find resources and enhance their design.

This practical guide will help all those involved in the design and delivery of online learning in higher education make the best choices when preparing courses for distributed learning.

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Please visit the authors' wiki at: www.socialnetworking.wetpaint.com

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CONTENTS

Preface	vii
Chapter 1 Social Networking as an Educational Tool	1
Chapter 2 Designing for a Distributed Environment	25
Chapter 3 Selecting the Media Palette	43
Chapter 4 The Tools in Practice	61
Chapter 5 Constraints on Course Design	133
Chapter 6 Evaluating Course Design and Understanding Its Implications	155
References	179
Index	193

PREFACE

This book addresses the issue of designing courses with web 2.0 tools and social networking approaches. While there are many excellent books on designing courses in general, and designing online courses in particular, this book makes a case for the fact that web 2.0 is changing the environment and the opportunities for course design. User-generated content, a host of social networking tools and the 'gift culture' are some examples of this changing landscape.

The intended readership is all those involved in any way with designing and producing courses for students. While the authors are both in e-learning at the higher education level, the book is not limited to these fields. The widespread adoption of technology and particularly of web 2.0 tools means that designing for social networking applies to a very wide audience.

This is a fast-changing area of development, and at times hotly contested in academic discussion. On the one hand there are an increasing number of students coming into higher education (and into school for that matter) with a confidence and a competence in using social networking tools such as texting, instant messaging or online social spaces in their personal life. At least some of these people are looking for the opportunity to use some of these technology applications in the part of their lives related to education and study. How should educators and educational institutions respond? On the other hand, there are serious issues to be addressed from the perspective of formal education. Some educators rightly point to the newness of certain media, or the fact that shifting fashion and technology may result in new applications disappearing as quickly as they appeared, leaving students (and courses) as

high and dry as museum pieces. There is a tension between not wanting to experiment with students, yet wanting to exploit new and highly flexible ways of making education easier, more flexible, and ultimately more valuable to learners of all ages and all walks of life.

This tension runs throughout the book as we seek to understand how to take advantage of the new educational opportunities opening up to our society through the incorporation of advanced, Internet-based means of communication and sharing information. We are of the opinion that the educational advantages should take priority in the design of educational activities, and that new technology should support this, not lead. The book is intended to appeal to a range of readers, from the experienced educator who seeks to respond to the educational challenges of new technology but is unsure where best to start, to those that have a greater familiarity with web 2.0 tools but are seeking a more analytical and systematic approach to their incorporation into mainstream educational activities.

The book is structured into six chapters:

Chapter 1 sets the use of social networking in context, not as a revolutionary paradigm shift, but as an evolutionary development of online practices. It also considers existing research and the ways in which research is changing in this area.

Chapter 2 addresses the detailed issues of distributed environments and the implications for course design.

Chapter 3 focuses on the media of text, audio, images, and video, and considers how best to use these in different contexts.

Chapter 4 is by far the longest chapter as it examines nearly 20 different tools that are used in educational contexts. For each tool, advantages and disadvantages are listed, and a case study of its use in practice is described.

Chapter 5 looks at limitations and problems in using social networking from three perspectives: students, faculty and institutions.

Chapter 6 presents a case for Emergent Design as a more appropriate approach to course design than traditional top-down models.

The book is underpinned by a range of interviews with practitioners, by personal experience of course design using these tools, and by considerable desk research of the extensive material on the web about the web 2.0 phenomenon.

Due to the fast-changing nature of Internet society, we do not regard this book as the last word on the subject, as almost certainly there will

be advances and casualties on the diversity of Internet applications by the time this book is printed and distributed. As a result, we would like to invite readers to contribute their experience or to update and extend the information in this book by helping to build a wiki resource on the use of web 2.0 and social networking for educational purposes by going to

www.socialnetworking.wetpaint.com

We look forward to reading your contributions online.

Robin Mason and Frank Rennie

July 2007

1

SOCIAL NETWORKING AS AN EDUCATIONAL TOOL

YET ANOTHER TREND...

The popularity of a wide range of social software, particularly with young people, has led many educators to think that this practice and enthusiasm could be turned to educational use. The purpose of this book is to assist this process by providing some guidelines for integrating social networking into course design and by documenting the activities of the early pioneers who are experimenting with innovative practices in their teaching. In this first chapter we aim to show that the roots of social networking are not a paradigm shift from what went before but a growth or development from previous practice and theory. Of course there have been other media which educators were convinced could transform teaching and learning:

- Television and then videoconferencing were going to render most ordinary lecturers redundant because every student would have easy access to outstanding lecturers, with resulting cost savings.
- Computer-based training was going to allow learners to work at their own pace, practicing as often as necessary and receiving programmed feedback from the ever-patient computer.
- Artificial intelligence was going to provide a truly responsive ‘tutor’ who would ‘understand’ the student’s misunderstandings and respond appropriately.

- Asynchronous computer conferencing was going to support global education in which students from different time zones around the world could take courses from prestigious universities without having to leave home or work.

The list could go on. Educational hype has a long and resilient history of jumping on the latest technology as the means of making education better, cheaper, more available or more responsive. Is social networking going to be any different? Our answer is, probably not, but this may be the wrong question. Ignoring social and technological trends is not the way forward for educators anymore than is chasing after every new movement because it is new. If a university were to issue each student with a slate and chalk it would be ludicrous, but equally, to expect all students on all courses to benefit from keeping a blog or creating multimedia items in their e-portfolio, is not a sensible way forward either. What we are advocating in this book is an open mind to the possibility that using some form of social software could be beneficial in most courses, given imaginative course design. The emphasis is squarely on how to use social software creatively, not on any assumption that these tools are predisposed to improving education, reducing costs, widening participation or any future priorities of higher education. These are merely tools; however, as we know, man is a tool-using animal!

WHAT ARE THE TOOLS?

The various tools to be considered in this book are all part of what has been called web 2.0 (O'Reilly, 2005). The underlying practice of web 2.0 tools is that of harnessing collective intelligence, and we have explored the relevance of this for education in a previous book (Rennie & Mason, 2004). As users add new content and new sites, they are connected through hyperlinking so that other users discover the content and link to it, thus the web grows organically as a reflection of the collective activity of the users. O'Reilly cites Amazon as an archetypal example:

Amazon sells the same products as competitors such as Barnesandnoble.com, and they receive the same product descriptions, cover images, and editorial content from their vendors. But Amazon has made a science of user engagement. They have an order of magnitude, more user reviews, invitations to participate in varied ways on virtually every page—and even more importantly, they use user activity to produce better search results. While a Barnesandnoble.com search is likely to lead with the company's own products, or sponsored results, Amazon always leads with “most

popular”, a real-time computation based not only on sales but other factors that Amazon insiders call the “flow” around products. With an order of magnitude more user participation, it’s no surprise that Amazon’s sales also outpace competitors. (O’Reilly, 2005)

Other examples of social software with relevance to education are:

- Wikipedia is an online encyclopedia in which the content is created and edited entirely by users.
- Folksonomy sites such as del.icio.us and Flickr in which users tag with keywords their photos or other content entries, thus developing a form of collaborative categorization of sites using the kind of associations that the brain uses, rather than rigid, preordained categories.
- Blogging, a form of online diary, adds a whole new dynamism to what was in web 1.0, the personal home page.
- Really Simple Syndication or Rich Site Summary (RSS) is a family of web feed formats used to publish frequently updated digital content, such as blogs, news feeds or podcasts.
- Podcasting is a media file that is distributed over the Internet using syndication feeds, for playback on mobile devices and personal computers.
- E-portfolios encourage students to take ownership of their learning through creating a dynamic, reflective, multimedia record of their achievements.
- Real-time audio and shared screen tools are used for multi-way discussions.

The web has always supported some forms of social interaction, such as computer conferencing, e-mail, and listservs. The level of social interaction they afford has become an established component of distance and even campus-based education. What has changed with web 2.0 is the popularity of social networking sites which Boyd claims, have three defining characteristics:

1. **Profile.** A profile includes an identifiable handle (either the person’s name or nickname) or information about that person (e.g. age, sex, location, interests, etc.). Most profiles also include a photograph and information about last login. Profiles have unique URLs that can be visited directly and updated.
2. **Traversable, publicly articulated social network.** Participants have the ability to list other profiles as “friends” or “contacts” or some equivalent. This generates a social network graph which

may be directed (“attention network” type of social network where friendship does not have to be confirmed) or undirected (where the other person must accept friendship). This articulated social network is displayed on an individual’s profile for all other users to view. Each node contains a link to the profile of the other person so that individuals can traverse the network through friends of friends of friends.

3. **Semi-persistent public comments.** Participants can leave comments (or testimonials, guestbook messages, etc.) on others’ profiles for everyone to see. These comments are semi-persistent in that they are not ephemeral but they may disappear over some period of time or upon removal. These comments are typically reverse-chronological in display. Because of these comments, profiles are a combination of an individual’s self-expression and what others say about that individual. (Boyd, 2006a)

These three attributes do not immediately suggest an educational use. Throughout this book, however, we will try to demonstrate ways in which they can be integrated in courses and programmes. More recently the term *People Power* on the web has been noted in relation to the success of blogging, user reviews, and photo sharing (Anderson, 2006); and observers speak of a ‘gift culture’ on the web whereby users contribute as much as they take. Examples include YouTube, MySpace and Flickr. The primary focus in social networking is participation rather than publishing, which was the primary feature of Web 1.0 activity. Bloch (n.d.) links web 2.0, mashups and social networking as “all intertwined in the brave new Internet, the so-called second phase of the evolution of the online world.” The essence of social networking is that the users generate the content. This has potentially profound implications for education.

USER-GENERATED CONTENT

The theoretical benefits of user generated content in education are fairly obvious:

1. Users have the tools to actively engage in the construction of their experience, rather than passively absorbing existing content.
2. Content will be continually refreshed by the users rather than require expensive expert input.

3. Many of the new tools support collaborative work, thereby allowing users to develop the skills of working in teams.
4. Shared community spaces and inter-group communications are a massive part of what excites young people and therefore should contribute to users' persistence and motivation to learn.

However, this assumes a transition between entertainment and education which has never in the past been an obvious or straightforward one. The early champions of educational television had a difficult time persuading learners that this entertaining (but passive) medium could be a tool for active and demanding education. Similarly, how will current users of computer games, blogging, podcasting, and folksonomies be convinced that they can use their favourite tools for getting a degree? O'Reilly suggests that we look at what commercial organisations are doing:

One of the key lessons of the Web 2.0 era is this: *Users add value.* But only a small percentage of users will go to the trouble of adding value to your application via explicit means. Therefore, Web 2.0 companies *set inclusive defaults for aggregating user data and building value as a side-effect of ordinary use of the application.* As noted above, they build systems that get better the more people use them.... This architectural insight may also be more central to the success of open source software than the more frequently cited appeal to volunteerism. The architecture of the internet, and the World Wide Web, as well as of open source software projects like Linux, Apache, and Perl, is such that users pursuing their own "selfish" interests build collective value as an automatic byproduct. Each of these projects has a small core, well-defined extension mechanism, and an approach that lets any well-behaved component be added by anyone, growing the outer layers of what Larry Wall, the creator of Perl, refers to as "the onion." In other words, these technologies demonstrate network effects, simply through the way that they have been designed. (O'Reilly, 2005)

What is the comparable onion in relation to education? We claim in this book that it is course design. Through appropriate course design, we can help learners to pursue their 'selfish interests' of passing the course, while at the same time adding value to the learning of other students.

Another way of looking at user-generated content, and one that is possibly less contentious, is to see it as a network. In a report from FutureLab, Rudd, Sutch and Facer (2006) note that:

Castells, for example, argues that the network is now the fundamental underpinning structure of social organisation—that it is in and through networks—both real and virtual—that life is lived in the 21st century. This perspective is also advocated by social commentators such as Demos, who argue that networks are the ‘most important organisational form of our time’, and that, by harnessing what they describe as ‘network logic’, the ways we view the world and the tools we use for navigating and understanding it, will change significantly. The ability to understand how to join and build these networks, the tools for doing so and the purpose, intention, rules and protocols that regulate use and communications, therefore, become increasingly important skills. This concept of the ‘network society’ calls into question what it means to be ‘educated’ today—what new skills, what new ways of working and learning, what new knowledge and skills will be required to operate in and through these networks? It requires us to ask whether our current education system, premised not upon networks but upon individualised acquisition of content and skills, is likely to support the development of the competencies needed to flourish in such environments. (Rudd, Sutch, & Facer, 2006, p. 4)

The wise use of web 2.0 technologies in education addresses this call for students to develop 21st century skills. Blogging, wikis, e-portfolios and social networks are all excellent tools for allowing learners to clarify concepts, establish meaningful links and relationships, and test their mental models. Furthermore, they provide a public forum in which the cumulative process of concept formation, refinement, application and revision is fully visible to student peers and teachers. By providing a comprehensive record of how concepts take form through multiple clusters of knowledge, such media can promote more complex and lasting retention of course ideas among students (Boettcher, 2007).

WHAT ARE THE LIMITATIONS?

Critics of user-created content refer to a breakdown in the traditional place of expertise, authority and scholarly input. They express concerns about trust, reliability and believability in relation to the move away from the printed word to the more ephemeral digital word (Poster, 1990). The web contains a plethora of unauthenticated, unfiltered information and most students lack the critical skills to penetrate this mass of undifferentiated material. In short, traditional notions of quality in higher education seem to be abandoned in the move to web 2.0 learning.

Another line of criticism is that course designers who use these technologies are merely pandering to the net generation, which is not in their best interests. Carlson notes that “not everyone agrees that Millennials are so different from their predecessors, or that, even if they are different, educational techniques should change accordingly” (Carlson, 2005). These critics feel that new technologies encourage a short attention span and lead students to demand immediate answers, rather than thinking for themselves.

Furthermore, if content is created by users on different systems (e.g. podcasts, blogs, wikis, chat systems, and other social networking software) then it can be difficult to keep track of where everything is, and to access it with ease, both for the users and the casual visitor. This in turn calls for new tools to help users search and integrate across content that may be quite fragmented.

Other commentators question whether social networking has real learning value and point to the superficiality of this informal mode of learning. Learning from websites and online discussion groups is very different from the orientation of formal courses, where stress is laid on learning step by step, just in case one needs it later or for the exam. By contrast informal learning is just-in-time and just the amount necessary to put to immediate use. However, Kapp (2006) argues that:

We can contemplate whether “real” learning happens with Web 2.0 technologies, we can be philosophical about the value of informal learning versus formal learning, we can tout the virtues of “collective wisdom” but in the end...none of that matters.

What matters is that kids are already using Web 2.0 technologies comfortably and effectively. If we old folks (over 30) don’t figure out how to effectively use these tools to help the younger generation learn what they need to be successful in our baby boomer-run companies, government agencies and other large organizations then we learning and development folks will be irrelevant. Conducting traditional classroom lectures for these gamers is not going to cut it and neither is our multiple-choice question, e-learning module format. We better stop bad mouthing Web 2.0 or eLearning 2.0 and start using these technologies or be passed up by the “digital natives” as Prensky calls them. (Kapp, 2006)

Others of the same persuasion apply the dictum, ‘If you can’t beat them, help them.’ They focus on developing critical thinking skills, analysis of the content of websites, and peer commenting on student assignments. In a similar way, Cross (2007) takes a positive stance

towards integrating informal learning and web 2.0, and describes an approach which has implications for the role of the teacher:

Because the design of informal learning ecosystems is analogous to landscape design, I will call the environment of informal learning a *learnscape*. A landscape designer's goal is to conceptualize a harmonious, unified, pleasing garden that makes the most of the site at hand. A *learnscape* strives to create a learning environment that increases the organization's longevity and health, and the individual learner's happiness and well-being. Gardeners don't control plants; managers don't control people. Gardeners and managers have influence but not absolute authority. They can't make a plant fit into the landscape or a person fit into a team. A *learnscape* is a learning ecology. It's learning without borders. (Cross, 2007)

In the following chapters we describe a wide range of 'learnsapes' and provide practical methods for implementing them.

STUDIES OF STUDENT BEHAVIOUR

The predictions that students who have grown up with digital media will learn differently and demand a more engaging form of education, have led to a number of studies and surveys of student attitudes, behaviours and uses of technology. A study by Oblinger and Oblinger (2005) talks about Millennials, those born since 1982, whose learning characteristics are defined as follows:

- Ability to multitask rather than single task
- Preference to learn from pictures, sound and video rather than text
- Preference for interactive and networked activities rather than independent and individual study.

However these characteristics have the following disadvantages:

- Shorter attention spans or choosing not to pay attention
- Lack of reflection
- Relatively poor text literacy
- A cavalier attitude to quality of sources.

Millennials could be described as having hypertext minds, craving interactivity, easily reading visual images, possessing good visual-spatial skills, and having the ability to parallel process. They will prefer learning in teams, will seek to engage with problems and enjoy experi-

ential forms of learning. Another study of millennials by Raines (2002) lists similar characteristics:

- Skilled at teamwork
- Techno-savvy
- Preference for structure
- Desire for entertainment and excitement
- Biased toward experiential activities.

Two European reports, one from Germany (Veen, 2004) and the other from Hungary (Karpati, 2002) both largely confirm the description of millennials outlined in the Oblingers' study. The German report refers to millennials as *Homo Zappiens* because of their habit of using remote controls, and outlines four characteristics:

- Scanning skills
- Multi-tasking
- Processing interrupted information flows
- Non-linear learning.

Not all of these skills, whether positive or negative, can be attributed to social networking, although a number of online gaming sites have web 2.0 characteristics.

An extensive study in the UK of largely pre-university students' use of online technologies (Livingstone & Bober, 2005) has some sobering conclusions:

- Young people lack key skills in evaluating online content and few have been taught how to judge the reliability of online information
- Most online communication is with local friends
- Nearly one quarter of the sample admitted to copying something from the Internet and passing it off as his or her own.

The researchers note, however, that the opportunities and risks of these technologies go hand in hand, and the more users experience the one, the more they experience the other. We turn now to what researchers are investigating in the web 2.0 world.

RESEARCH ISSUES

Web 2.0 Research Literature

The technologies which have come to dominate the activities of young people have also been taken up by researchers, academics and lecturers as methods of disseminating their thinking and their practice. A

simple browse through the reference section of this book shows that URLs dominate the entries, rather than publisher citations. Much of the literature on the educational use of web 2.0 technologies is online—in blogs, podcasts, wikis and social networking sites. For those trying to keep abreast of developments, it is more important to have the right RSS feeds than the right journal subscriptions.

Of course in many scientific disciplines, printed journals and books have long been an outmoded form of dissemination for research—too late, too inaccessible, and too expensive. Web 1.0 was an improvement over print as a means of transmitting and consuming research. What is different with web 2.0 technologies is that real interaction, peer commenting and collaborative research are actually happening in a distributed, global environment. Knowledge is created, shared, remixed, repurposed, and passed along. In short, web 2.0 is a research network as well as a learning network.

However, do web 2.0 networks constitute research? The 2007 Horizon Report notes that “academic review and faculty rewards are increasingly out of sync with new forms of scholarship”. Will academics list blog entries in their CV? The Horizon Report goes on to say “The trends toward digital expressions of scholarship and more interdisciplinary and collaborative work continue to move away from the standards of traditional peer-reviewed paper publication” (New Media Consortium, 2007). The essence of research has always involved notions such as ownership and copyright, objectivity and replicability. Blogging is very different: it is much less formal; it is usually written from a personal point of view, in a personal voice. Wikis do not privilege personal ownership and are ephemeral or at least are constantly changing. Some researchers counter these criticisms by underlining the fact that our relation to knowledge is changing. The shelf life of information is now so short that knowing where to find information is more valuable than knowing any particular piece of information. The capacity to form connections between sources of information, and thereby create useful information patterns, is what is needed in a knowledge economy. Knowledge used to be organised in strictly classified disciplines and subjects, but is increasingly becoming more fluid and responsive, allowing it to be organised in different ways for different purposes. Furthermore, as Stephenson notes:

Experience has long been considered the best teacher of knowledge. Since we cannot experience everything, other people’s experiences, and hence other people, become the surrogate for knowledge. ‘I store my knowledge in my friends’ is an axiom for

collecting knowledge through collecting people. (Stephenson, n.d.)

Experienced academic bloggers find that this forum for airing ideas and receiving comments from their colleagues helps them to hone their thinking and explore avenues they might otherwise have overlooked. The Horizon Report lists new scholarship and emerging forms of publication as one of its six key trends in 2007 as most likely to have a significant impact in education in the next five years.

While significant challenges remain before the emerging forms of scholarship we are seeing are accepted, nonetheless, there are many examples of work that is expanding the boundaries of what we have traditionally thought of as scholarship. In the coming years, as more scholars and researchers make original and worthwhile contributions to their fields using these new forms, methods for evaluating and recognizing those contributions will be developed, and we expect to see them become an accepted form of academic work. (New Media Consortium, 2007, p. 21)

Knowledge is no longer acquired in a linear manner. We can no longer personally experience and acquire all the learning that we need in order to act. We must derive our competence from forming connections with other people. Blogs and wikis are ideal tools for this and what we see in these tools are examples of networks of growing knowledge and understanding. In terms of the use of web 2.0 tools in education, research on the whole is not to be found in print-based literature. Knowledge and understanding of practice are developing within a network of interactions through web 2.0 tools online.

Why then are we choosing to write a book on the use of these technologies for education? Isn't this contradicting our case that there is a change in how knowledge is being created and accessed? Yes, the book will be out-of-date before it is printed, much less read, but no, we are not trying to suggest that there is no place for printed books. What we are aiming to do in this book is draw together what is already known about how to use web 2.0 technologies and to provide direction in how and why to use them in course design. Furthermore, we have initiated a wiki to accompany the book, as a way of keeping the content dynamic. The link to it is: <http://www.socialnetworking.wetpaint.com>

The Changing Learner

One of the questions which have arisen due to the phenomenal uptake of new technologies by young people is whether and to what extent

learners are changing. That is, what is the effect of computer games, mobile phones, the Internet, and social networking on learners who have grown up with these as an integral part of their environment? The most widely quoted respondent to this question is, of course, Prensky whose papers on ‘digital natives’ (the net generation for whom everything digital is natural) and ‘digital immigrants’ (those who have had to learn the language of these technologies as mature adults) have sparked controversy, further studies, and commentators on both sides of the fence (e.g. Allen & Seaman, 2006; Conole, de Laat, Dillon, & Darby, 2006; Kvavik & Caruso, 2005). Prensky (2001a, 2001b) holds that digital natives are different in kind from digital immigrants.

It is now clear that as a result of this ubiquitous environment and the sheer volume of their interaction with it, today’s students think and process information fundamentally differently from their predecessors. These differences go far further and deeper than most educators suspect or realize. (Prensky, 2001a)

Prensky’s conclusions are based (loosely) on research into the neuroplasticity of the brain and he suggests that there may be an actual change in the brains of young people who have spent hours of their growing period as screenagers gaming, interacting online, and creating online content. Owen (2004) counters such sloganising with a reference to Brown and Duguid (2000):

In this study Brown and Duguid’s central theme is that access to information does not equate to knowledge. Brown and Duguid note, much of what we recognise as learning comes from informal social interactions between learners and mentors. These social interactions are difficult to achieve in mediated instruction. They recognise that technology can enhance instruction in remarkable ways; however, it cannot replace the insights that students receive by struggling to make sense of information with both peers and mentors. They contend that the gung-ho tunnel vision of commentators like Prensky—seeing only one way ahead (if all you have is a hammer, everything looks like a nail!), has led to erroneously simplified and unrealistic expectations of what our future in the information age will be like. (Owen, 2004)

Nevertheless, Owen agrees with Prensky that the tools we use inevitably change how we think, how we learn, what we may think and what we may learn, but he sees this as evolutionary rather than revolutionary. Johnson and Johnson reiterate this point of view:

Because the nature of technology used by a society influences what the society is and becomes, individuals who do not become technologically literate will be left behind. Influences of a technology include the nature of the medium, the way the medium extends human senses, and the type of cognitive processing required by the medium. (Johnson & Johnson, 2004, p. 785)

Johnson and Johnson are confirming the idea already suggested above that educators need to use the tools that are common in the social context of the day, because they are determining the way people learn.

A major piece of research on student reactions to the use of information technology (IT) in education was carried out by Kvavik and Caruso in 2005. Reassuringly, students in this survey still saw faculty knowledge and expertise as the most important element in learning, but the majority wanted instructors to make moderate use of IT, whilst equal numbers wanted extensive use or limited use.

Another aspect of the changing learner is the increasing multiculturalism of most university classes. This is especially true of online, distributed courses, as students from outside the originating institution may be part of each cohort, making a more culturally diverse online environment than was the case for traditional classrooms in the past. Course design manuals used to begin with the process of identifying learners' needs and background knowledge. This may be possible with a relatively homogeneous student body, but becomes impossible in a multicultural context. Cultural backgrounds are inextricably related to how we learn, and hence learning needs of students may well vary by culture. Attitudes to particular content (political correctness, contextuality in meaning-making and views about absolute reality), variations in writing styles (formality, vocabulary, directness), and above all, concepts about the role of the learner and of the teacher (criticism, authority, politeness); these are all culturally specific, and hence highly variable in multicultural learning environments. The practices of peer evaluation, student-generated content, and teacher-as-equal-partner may make students from some non-Western cultures feel uncomfortable and leave them floundering rather than participating. Experienced practitioners of online multicultural environments usually recommend flexibility and openness on the part of course designers. For example, Palloff and Pratt (2003) suggest "recognizing the different ways in which students might respond to instructional techniques online and being sensitive to potential cultural barriers and obstacles is yet another means by which the online classroom can become more culturally sensitive".

Similarly, Henderson (1996) promotes an eclectic paradigm which does not assume that any one instructional pedagogy is immutable but provides an epistemological and pedagogic pluralism that allows students to interact with materials that reflect multiple cultural values and perspectives. Another approach to cultural pluralism is to recognise that every student is individual in his or her learning requirements regardless of cultural background. Providing diversity in types of resources, assessments, communication tools, and learning activities not only creates greater flexibility for all learners to customise their learning, but also provides a self-reinforcing learning environment for creativity and innovation (Price & Rennie, 2005). The issues raised by multicultural classrooms are not new and not restricted to online learning, though they will undoubtedly be exacerbated by web 2.0 technologies.

Collaborative Learning

Johnson and Johnson (2004) analyse the history of cooperative and collaborative learning and the way in which these practices have been revitalised by the advent of online learning. They cite a range of studies which demonstrate that cooperative learning online results in higher achievement than individualistic learning. They conclude that “few educational innovations hold the promise that technology-supported cooperative learning does...” (p. 806). Jenkins (2006) points out that one of the implications of online collaborative work is that educators need to rethink the individualistic foundations of assessment in higher education. Social networking encourages collective contribution, not individual ownership. Creativity is different in an open source culture. He uses the term *distributed cognition* and outlines the new skills educators need to develop in their learners:

Applications of the distributed cognition perspective to education suggest that students must learn the affordances of different tools and information technologies, and know which functions tools and technologies excel at and in what contexts they can be trusted. Students need to acquire patterns of thought that regularly cycle through available sources of information as they make sense of developments in the world around them. Distributed intelligence is not simply a technical skill, although it depends on knowing how to use tools effectively; it is also a cognitive skill, which involves thinking across “brain, body, and world.” The term “distributed intelligence” emphasizes the role that technologies play in this process, but it is closely related to the social production of knowledge that we are calling collective intelligence. (Jenkins, 2006, p. 38)

Course design is a particularly important component of successful online collaborative learning. Wenger (1998, p. 229) clarifies the relation between course design and learning: 'Learning [itself] cannot be designed: it can only be designed for—that is, facilitated or frustrated'. The essence of online collaborative course design is the use of activities appropriate to the subject and level of the students. Generic models include: an online debate, joint creation of a website, group presentations, and peer comments on student work. Web 2.0 course design involves collaborative uses of blogs, wikis, e-portfolios and podcasts. These are in their infancy, although educational uses of blogging have a marginally longer history.

Student-Centred Course Design

The issue of student versus teacher centred course design is another long-standing one which continues to evolve with the impact of social networking. Designing a course around the learner's needs is a cornerstone of open and distance learning where it usually involves passing at least some control to the learner over pacing, interaction with the course content, and timing of the assessments in order that part-time students can fit studying around work and family commitments. Garrison and Baynton (1989) argued that control is a dynamic relationship between independence, power and support, and Hall, Watkins and Eller (2003) talk about the need to find a balance between providing the student with enough structure to keep their studying on track, and enough freedom to work creatively and flexibly on the course.

The advent of user or student generated content adds a new dimension to the debate. There are a number of ways in which students can participate in creating the content of a course. Discussions and debates have been standard practice on campuses and have been used regularly in online courses where asynchronous conferences are the established mode of communication. Similarly, the practice of resource-based and problem-based learning pre-dates social networking by some decades. Both of these design models imply that students find appropriate material in order to study the course. Student-generated content takes this a step further by students not just finding content (in the form of resources), but actually creating it (through blogs, wikis, e-portfolios, and other multimedia presentations).

The obvious implication of student-created content is a changing role for the teacher and for the educational institution. There is a need for teachers not only to master the new technologies, but also to understand and capitalise on the pedagogical implications. There is a need for institutions to monitor student access to the technologies and consider what

to provide for students and what to leave to social trends to determine. Many of the web services are free and may already be familiar to students from social and informal learning activities outside of their studies.

The Vice Chancellor of the UK Open University, in considering the implications of student-created content for the university, posed the following issues:

how best we deliver customer service and student support in this new world and how we harness this gift culture to enhance student support with peer-to-peer mentoring and collaborative learning models; how we deal with the shifting boundaries between formal and informal learning. What we see on the Web are people from all over the world creating communities of interest (some of them very sophisticated indeed) on a whole range of subject matter—and what we need to do is ask ourselves how we harness this energy and recognise the learning—if that is indeed useful to people as they negotiate their careers and lives. (Gourley, 2006)

Mason and Lefrere (2003) define the essence of this move to a sharing environment as involving processes for developing trustworthiness. Jameson, Ferrell, Kelly, and Ryan (2006) also conducted research on the importance of trust in collaborative online learning networks. Course designers need to set up learning systems that recognise the need for building trust and exploit the learners' social networks.

The changing role of the student obviously has implications for the role of the teacher. Beldarrain (2006) notes the transition from teacher as deliverer of knowledge, to facilitator of online interaction. With the advent of student-generated content, she predicts that “the future instructor may have to be more of a partner in learning than a facilitator. The instructor must view the students as contributors of knowledge, and thus allow them to participate in the creation of content” (p. 149). The instructor, therefore, needs to provide feedback and build rapport. Nearly ten years ago, Papert noted that there was a clash between the dominant ideology of curriculum design and the empowerment learners get from games and other technologies which enable the user to take charge of his or her learning (Papert, 1998). Rudd et al. (2006) have reiterated this point:

Currently most discussions about increasing learner ‘choice’ and ‘voice’ are focused around giving learners a greater variety of routes through predetermined and predefined subjects and curriculum content. However, a truly personalised system requires

that learners will not only have greater choice and influence over the pace, style and content of learning but that they are also supported to become active partners in developing their own educational pathways and experiences. (p. 7)

Student-centred learning and the technologies which enable them to generate content will continue to have profound effects on the inter-relationships of students, teachers, and course content. We develop this theme at greater length in chapter 6.

BEYOND CONSTRUCTIVIST THEORY

Many researchers consider that course design based on constructivist theories of learning is highly compatible with the use of web 2.0 tools. Constructivist curricula favour an open-ended, negotiable approach which structures activities so that students have opportunities to collaboratively negotiate knowledge and to contextualise learning within an emergent situation. This reflects the two tenets of constructivism: that (1) learning is an active process of constructing knowledge rather than acquiring it, and (2) instruction is a process that involves supporting that construction rather than of communicating knowledge (Duffy & Cunningham, 1996, p. 171).

Through the provision of activities for students to direct their own learning, the designer acknowledges the students' need for autonomy in the learning process in order to construct their own understanding. The provision of realistic or authentic contexts for learning is the basis for many constructivist learning environments, as the purpose is to stimulate learners to relate their thinking to actual practice.

Communication through the learning environment is a key feature of constructivist design, especially where the students are geographically isolated. It is through dialogue in chat rooms, commenting on blogs, collaborating through wikis and self-expression through e-portfolios that students are able to develop as members of their learning community, to create shared understandings, to challenge and to question the key issues of their area of study.

Learners are considered to be distributed, multidimensional participants in a socio-cultural process. This concept moves away from the idea that learning is effective internalising of knowledge, toward one that involves a connection with communities and a pattern of participation in community. It should not be a lonely act of a single person but a matter of being "initiated into the practices of a community, of moving from legitimate peripheral participation to centripetal participation in

the actions of a learning community” (Duffy & Cunningham, 1996, p. 181).

Learners in a constructivist environment need to be active and interactive, and web 2.0 software is inherently participative.

Web 2.0 is where anyone can not only *take* information down *from* it but also create content and upload *to* it. In this respect the Web is not simply a one-way means of *obtaining* knowledge, but also a place where you *interact* with the materials and *annotate* and *contribute* to the content. Such sites frequently display other Web 2.0 characteristics such as automated access through RSS feeds and ability to find related materials through tagging and other social networking devices. (Stevens, 2006)

Nevertheless, other educators are beginning to look beyond constructivism and to associate it with web 1.0 thinking. For example, Siemens (2004) claims that web 2.0 technologies have changed the learning landscape such that the three pillars of learning theory (behaviourism, cognitivism and constructivism) are no longer adequate for describing the world in which we now are learning:

Constructivism suggests that learners create knowledge as they attempt to understand their experiences (Driscoll, 2000, p. 376). Behaviorism and cognitivism view knowledge as external to the learner and the learning process as the act of internalizing knowledge. Constructivism assumes that learners are not empty vessels to be filled with knowledge. Instead, learners are actively attempting to create meaning. Learners often select and pursue their own learning. Constructivist principles acknowledge that real-life learning is messy and complex. Classrooms which emulate the “fuzziness” of this learning will be more effective in preparing learners for life-long learning.

Learning theories are concerned with the actual process of learning, not with the value of what is being learned. In a networked world, the very manner of information that we acquire is worth exploring. The need to evaluate the worthiness of learning something is a meta-skill that is applied before learning itself begins. When knowledge is subject to paucity, the process of assessing worthiness is assumed to be intrinsic to learning. When knowledge is abundant, the rapid evaluation of knowledge is important. Additional concerns arise from the rapid increase in information. In today’s environment, action is often needed without personal

learning—that is, we need to act by drawing information outside of our primary knowledge. The ability to synthesize and recognize connections and patterns is a valuable skill. (Siemens, 2004)

He posits instead, a theory he calls connectivism, whose principles he defines as:

- Learning and knowledge rest in diversity of opinions.
- Learning is a process of connecting specialized nodes or information sources.
- Learning may reside in non-human appliances.
- Capacity to know more is more critical than what is currently known.
- Nurturing and maintaining connections is needed to facilitate continual learning.
- Ability to see connections between fields, ideas, and concepts is a core skill.
- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
- Decision making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision. (Siemens, 2004)

Connectivism as a theory presents a model of learning that reflects a society in which learning is no longer a personal, individualistic activity. It acknowledges the fact that the ways people learn and function are altered when new tools are used. Siemens is critical of educators for being slow to recognize both the impact of new learning tools and the environmental changes in what it means to learn. Connectivism is his theoretical foundation for the learning skills and tasks needed for learners to flourish in a digital era.

Learning Design

A new area of research has emerged recently called Learning Design. It reflects a shift of focus in course design from an emphasis on providing content to an emphasis on designing activities that help students learn through interaction with sources, people and ideas. Learning designs provide a way of representing learning activities so that course designers can easily identify the essence of a design or learning sequence and apply it to their own curriculum area. Through a process of breaking down activities into constituent parts, it guides individuals

through the process of creating activities and incidentally, highlights policy and technology implications. It also provides a common vocabulary for course designers to understand how students learn through activities. In short, learning design offers a method for reusing good practice across many disciplines. An example of research in this area comes from Australia:

In a climate where individual institutions are experiencing increased costs at the same time as they face increased demand for more flexible approaches to learning, the Australian Universities Teaching Committee (AUTC) considers there is benefit to be gained in developing shared resources and disseminating successful, generalisable templates between institutions. One product of this assessment is a project, now completed, which is captured here as 'Learning Designs'.

The project was commissioned in 2000 by the AUTC to explore the use of Information and Communication Technologies (ICTs) to facilitate flexible learning opportunities for students by identifying learning designs that have been demonstrated to contribute to high quality learning experiences and determining which learning designs may be redeveloped in a more generic form. (<http://www.learningdesigns.uow.edu.au/project/index.htm>)

There are a number of learning design tools which have been developed to support the process of course design from creation, through technical implementation, to actual presentation to students. One of these has been developed by researchers at Oxford University and the tool is called Phoebe (<http://phoebe-project.conted.ox.ac.uk>). Another is the Joint Information Systems Committee (JISC) Pedagogic Planner (<http://www.wle.org.uk/d41/>) and a third is called Compendium and was developed at The Open University (<http://kmi.open.ac.uk/projects/compendium/>). The value of these tools is currently untested on any significant scale. They are essentially decision support tools and some (e.g. the JISC Pedagogic Planner) are highly structured, while others (e.g. Phoebe) are open-ended. Early indications are that some users welcome them and others with different working and thinking practices find it preferable to design on paper or from instinct about what works with students.

OUTCOME-BASED DESIGN

What should drive the process of course design: pedagogical principles, specific problems to be addressed, or tools to be used? It is generally

acknowledged that there is no best approach to begin the process of course design. However, there are fashions or trends and currently outcome-based design is in vogue (and definitely out of fashion are technology-driven rationales and teacher-centred approaches).

Learning outcomes are statements of what students will know or be able to do, if they have learned everything in the course. Outcomes are subtly but distinctly different from learning objectives, which are statements of what is going to be taught, although they may be expressed as if the students were going to learn it. Objectives are normally written using behavioural verbs: list, define, calculate, state. Unfortunately behavioural objectives are not so easily adaptable to the higher forms of learning such as understanding and being creative or to critical reflection or transformative learning. With learning outcomes, there is a slight shift from content to process as the outcome is more explicit about how evidence is to be provided, rather than the evidence itself.

Apart from this shift to a focus on process, learning outcomes have also become the driver for the assessment strategy of a course. Coats and Stevenson (2006) claim that it is important to “ensure that assessment strategies and assessment methods support the development of the stated outcomes and enable them to be appropriately assessed.” Furthermore, the learning outcomes and their assessment should make a positive contribution to the learning process.

Good assessment now is that which most closely reflects desired learning outcomes and in which the process of assessment has a directly beneficial influence on the learning process. (Boud, 1995)

Knowing the expected outcomes and being clear about the criteria that will be used to assess whether or not they have been achieved gives more control to the learner and thus enables him or her to use that assessment as a learning experience. Assessment can be, indeed always is, a learning experience, with or without an outcomes-based approach and clear assessment criteria. The point is that appropriate outcomes and shared criteria can enhance that learning.

How can an educational assessment methodology (or paradigm) that places emphasis on the learners and supposedly encourages them to take more responsibility for their own learning—stressing autonomy and empowerment at the same time—subject that learner to a prescribed curriculum and defined outcomes to learning? One approach to this seeming contradiction is to see assessment as an integrated part of teaching and learning, in which both teacher and student play an interactive role, and in which teaching and learning are seen as complex and socially mediated (Coates & Stevenson, 2006).

Another approach to this contradiction is proposed by Irlbeck, Kays, Jones and Sims (2006) who suggest using emergent models of instructional design, rather than the top-down models in which the ‘experts’ decide the objectives, assessment criteria, learning outcomes, and activities. Emergent theory suggests a radical alternative—that design should proceed from the ground up using a process of natural selection that will weed out less useful information. Boettcher (2007) sees the unpredictability of a course which is allowed to evolve with the students, as highly engaging:

Other valuable features of games and simulations are their unpredictability, their interactive qualities, and their infinite variety. Canned, predictable, and static learning resources such as books, preprogrammed tutorials, and linear video experiences are less interesting and less engaging. The more dynamic and interactive the learning experience, the more likely it is that students will invest greater amounts of time in the learning process. (Boettcher, 2007)

The subject of emergent design is further developed in chapter 6.

ANOTHER BOOK ON COURSE DESIGN?

There is a substantial literature on course design in higher education and particularly so for distributed and distance education (e.g. Gagnon & Collay, 2006; Jochems, van Merrienboer, & Koper, 2003; Rabinowitz, Blumberg, & Everson, 2004). Why is another book needed? Evidence from the literature on the use of new technologies in education shows that many educators appropriate the new technology—be it computer-based learning, videoconferencing, or computer conferencing—but use them to mirror existing practice rather than to exploit their real affordances. Conole, Oliver, Falconer, Littlejohn, and Harvey (2007) argue that this gap between the potential of technologies and the reality of actual use is due to a number of interconnected issues:

- Lack of understanding of how they could be used
- Lack of appropriate guidance at the course design stage
- Immaturity of the tools
- Organizational barriers.

Waller (2007) predicts a similar misuse of web 2.0 tools:

You find nowadays that PowerPoint is inevitable and used with the slightest of excuses. In the main it no longer supports the

speaker as it should but instead acts as a crutch.... Now we all just stare at the PowerPoint, looking but not seeing, thereby relieving our brain of the tiresome task of seeing what the speaker is saying. Very soon we will have death by podcast as people with uninspiring voices dump what they have to say onto enormous mp3 files. We will have death by short learning programme, rapidly produced by someone who is convinced that this will always produce the required results. We will have death by blogs and wikis and we will be inundated with demands to share what we know in online communities.... If these interventions are not designed by people who know about these things, these events will fail in their purpose.... (Waller, 2007)

The role of the course designer is arguably *more* relevant with web 2.0 tools than with traditional forms of teaching and learning. It is the intention of this book to address this need by providing a framework and above all, examples of how web 2.0 tools can be used appropriately in distributed and distance education settings.

CONCLUSIONS

This synopsis of some of the issues affecting web 2.0 course design has emphasised a number of critical issues. We summarise these in several aphorisms:

1. The medium is only as good as the design of the instructional strategy the educators have used.
2. Cooperation is the watchword, not control. Web 2.0 applications work on the basis of participation not coercion.
3. Course design is no longer about transmission and consumption; it is about co-creating, sharing, repurposing, and above all, interacting.

But as with many areas of web 2.0, the new tools and approaches are only a development or fuller realization of the true potential of the web platform. This gives us a key insight into how to design educational uses for these applications and services.

This overview of the issues related to using web 2.0 tools in education has tried to convey an important concept: that web 2.0 is actually more than a set of tools and services. It is the powerful ideas behind the tools and services that have so much potential for education: the reality of user-generated content, the network effects of mass participation, and the openness and low threshold for easy access. These factors are

inherent in the original concept of the web, just as their application to education builds on long established principles of best practice: student engagement and interaction in learning, and student ownership and management of learning.

2

DESIGNING FOR A DISTRIBUTED ENVIRONMENT

DEFINITION OF TERMS

Before we go much further, it is useful to clarify what we mean by the terms *distributed*, *blended* and *flexible* learning. In recent years a strong interest has developed in the support of distributed learning systems that are flexible enough to permit easy access to multi-mode educational resources, over a wide geographical area. Amongst the plethora of definitions of distributed learning, however, there is little common ground. The term *distributed* in relation to education, particularly higher education, encompasses a number of different practices. For some the term is synonymous with distance education and e-learning (Oblinger, Barone & Hawkins, 2001); for others it is identical to the term *blended learning* (e.g. Bonk & Graham, 2006); others prefer to distinguish between these terms. For example, according to Tarleton State University (2004):

Although the phrases “distributed education” and “distance education” are often used interchangeably, distributed education has a broader meaning. The primary characteristic of distance education is that learning takes place independently of place and time, allowing students to absorb the content from a distance. On the other hand, the principal goal of distributed learning is to customize learning environments to better-fit different learning styles, whether students are on or off campus. In this new pedagogical model, students are encouraged to learn in an interactive and collaborative environment.

Distance education is a subset of distributed learning, focusing on students who may be separated in time and space from their peers and the instructor. Distributed learning can occur either on or off campus, providing students with greater flexibility and eliminating time as a barrier to learning. A common feature of both distance and distributed learning is technology. Regardless of whether students are on campus or online, there are many implications of integrating technology into education, i.e., in making learning distributed.

Blended learning is also a term that encompasses a range of different practices, though usually it refers to learning that combines face-to-face teaching with online resources. The learners may be full-time campus students or they may be located partially on campus and partially at a distance. Although these terms are always changing in their application, it might be fairly safe to say that distributed learning is commonly used for the teaching model of an institution or university, whereas blended learning tends to be used at a course level to describe particular design components. A few researchers (Oliver & Trigwell, 2005) have argued against the term *blended learning* altogether, from both philosophical and pedagogical perspectives, but even allowing for (or perhaps because of) the vagueness and imprecision in terminology, both *blended* and *distributed* learning activities are frequently described in the literature and seem likely to continue in use for the foreseeable future.

As these descriptions make clear, technologies of varying sorts are a central component in the practice of distributed learning. In this chapter we will consider successful ways of conveying different kinds of content, and how this content can be made available in different formats, both synchronous and asynchronous.

As noted, while *blended learning* is a contentious term, it generally refers to a combination of face-to-face and online learning (such as using e-learning to complement classroom activity or vice versa). A study into the undergraduate experience of blended e-learning in the UK (Sharpe, Benfield, Roberts & Francis, 2006) comprehensively explored recent literature and practice, and came up with some key “recommendations to guide future policy, practice, and research”. This report forms important background reading to the present chapter, but a slightly wider interpretation is taken here to accommodate the fact that (1) blended learning may take place on one campus (i.e. without necessarily any geographical distribution) and (2) distributed learning, although combining distance and e-learning, may not necessarily

include any face-to-face activity (as is normally implicit in the term *blended learning*).

For the purposes of this chapter, we will assume the following properties define distributed learning:

- The components of the course are distributed across multiple media and this tends to imply a certain amount of choice of media as well as a tendency towards a student-centred learning approach.
- Distributed learning can be used to augment traditional classroom-based courses, to deliver distance education courses or to create wholly online courses.
- Providing flexibility for students in terms of time or location of study is one key aim of the pedagogy of distributed learning.

Schematically, the relationship between blended learning, e-learning, and distributed learning can be illustrated in Figure 2.1.

The apparent lack of consistency amongst the various definitions can be partially explained by the fact that distance education and campus-based teaching are converging due to the growth of ICT and the web, as well as the growing student demand for flexible learning options (Tait & Mills, 1999). A number of universities that introduced online courses as a way of attracting new learners, have found to their dismay that their campus students also opt for these courses, often creating their

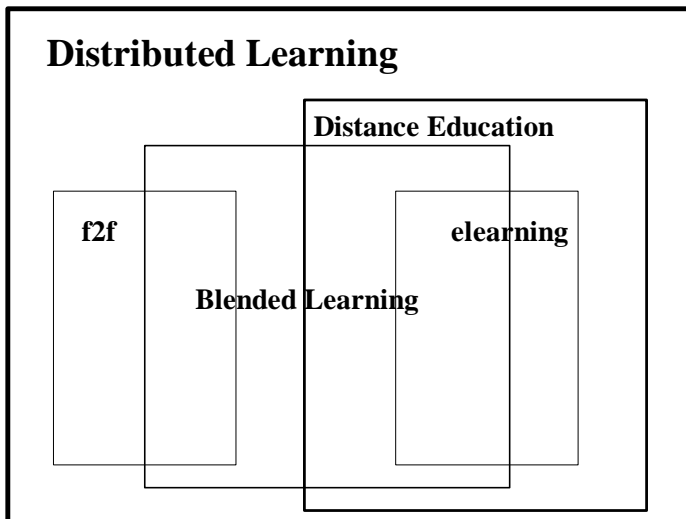


Figure 2.1 The relationship of e-learning to distributed learning (Mason & Rennie, 2006, p. xvii).

own blend by taking one online course plus several face-to-face courses (Young, 2002). Across the sector, provision is moving towards a pattern characterised by brief, intensive face-to-face interventions punctuating longer periods of independent or group study facilitated by learning technologies (Middlehurst, 2002). Distributed learning has arisen as a term which bridges educational practice from face-to-face to distance learning (Lea & Nicoll, 2002). The availability of new learning technologies, both synchronous and asynchronous, has added depth and richness to the potential of distributed education.

A growing number of institutions also make use of videoconferencing for higher education, often in combination with their own online learning environment (VLE) in a manner that combines asynchronous access (discussion boards, e-mail, tutorial resources, online libraries) with synchronous access (instant messaging, Skype audio and video) to facilitate the interaction between tutors and students. New communication tools such as instant messaging, Skype, shared whiteboard technologies, and reflective tools such as blogging, wikis, and e-portfolios have been added to long-established means of asynchronous communications (print, e-mail, discussion boards etc.) to become part of the distributed learning designer's palette of options in creating dynamic and varied educational environments. To be effective in combining these new media, it is important to analyse what choices are being made by practitioners, and for what reasons. How do course designers decide what technologies to use? What considerations underpin their design solutions?

STUDENT-CENTRED LEARNING

According to existing literature, one of the key factors in designing courses with a high level of flexibility must be the development of a student-centred, rather than teacher-centred learning environment (EIC, 2004; Gudmundsson & Matthiasdottir, 2004; Meyers & Jones, 1993; Motschnig-Pitrik & Holzinger, 2002). Based on constructivist theories of learning, student-centred approaches to course design create an environment in which learners discover or work out for themselves an understanding of the subject or concept through critical analysis and reflection, often in conjunction with other learners. By combining a range of media and communication modes, the course no longer consists of one authorised version of knowledge such as is conveyed by a lecture or a textbook. The resources of the web, the interactions with other learners, the guidance of the teacher, and the experiences resulting from collaborative activities all combine to effectively distribute the

inputs of the course so that the onus shifts to the individual students to construct their own understanding of the topic. Relan and Gillani (1997) confirm this analysis of the impact of distributed education:

The predominant source of content shifts from the textbook and the teacher to a more varied source of information. Further, the nature of the content becomes dynamic, versus the static texts published on a certain date. (Relan & Gillani, 1997, p. 44)

The role of the teacher or tutor is to generate an infrastructure for constructive interaction and to help students individually and collectively to negotiate their own meaning. The course designer, who may or may not be the same as the teacher or tutor, needs to understand the strengths and weaknesses of available technologies and to know something about the background of the potential students. Even with this understanding, it is still problematic for course designers to decide what components to use and where to start. Anecdotal evidence suggests that many courses are technology-led; that is, a new piece of software appears to be gaining followers, so the course designers decide to 'have a go with it'. This can result in technologies being peripheral to the core content of the course. Students immediately detect this and avoid engaging at all or only superficially with this component. In some cases communication technologies are used on a course where only a proportion of students have access.

In a practical guide for the UK Quality Assurance Agency, Casey and Wilson (2006) provided a theoretical and practical framework to consider flexible learning in the context of further and higher education, and this is also a good conceptual starting point for distributed learning. In particular, the "five dimensions of flexibility" proposed by Collis and Moonen (2004) formed a useful framework for staff interviews and could be further developed as an empirical tool for quantifying the level of flexibility of distributed learning courses. The five elements of flexibility they defined are: time, content, entry requirements, delivery and logistics, and institutional approaches and resources.

In this context also, it is worth considering the proposed model for analysis and implementation of flexible programme delivery offered by Normand and Littlejohn (2006) although they acknowledge the fact that their selected case studies reflect an "instructor-offered flexibility" rather than a more comprehensive institutional approach. They base their model on previous work that identified a framework of five components for successful design of flexible programme delivery. These are strategy, structure, roles and skills, management processes, and technology, but their new model refined this to just three components

by combining the central role of technology with the grouping of strategy and structure as ‘contextual factors’, grouping roles and skills and ‘management processes as ‘process factors’, (both of these factors being embedded within the strategic thinking of the institutional structure) to provide a “set of tailorable tools to manage learning.”

SOCIAL NETWORKING AND LEARNING

The development of online community structures to facilitate learning is as old as the Internet itself. A considerable, one might almost say exhaustive, amount of academic literature has been produced on the subject of constructing, maintaining, supporting, and evaluating online communities for educational (and other) purposes (e.g. A. J. Kim, 2000; Preece, 2000; Smith & Kollock, 1999). We have written previously about the powerful significance of networked communities for creating intimacy and support for self-directed learning (Rennie & Mason, 2004, chap. 2) and we do not propose to elaborate further on this topic, except to try to relate it to the increasingly flexible online environment of web 2.0 applications. Weller (2007a) has argued that the design features of the Internet—particularly its capacity for robust, decentralized, open communication—have been transformed into recognisably social features of the system, and that these have a particular importance for the way online learning communities function. Using the examples of a number of successful online communities, Weller asserts that the openness inherent in the Internet encourages the sharing, group editing, and self-policing of information in online learning communities which, he argues, are a logical conclusion of e-learning.

The decentralised nature of the communication systems allows users access from a variety of locations using a variety of devices, and this placing of greater responsibility on learners to manage and direct their own learning will have profound implications for educators and the education establishment. In effect, ‘teachers’ and ‘tutors’ will need to change roles from being the sole repository of knowledge, to roles in which their experience is utilised to help facilitate and focus learners to contextualise knowledge within the wider framework of their experience. This multi-level hyper-interactivity is critically encouraged by the technical and social construction of web 2.0, and can be considered an emergent property from what is effectively a complex adaptive system. Thinking about web 2.0 in terms of the systems analysis of a complex adaptive system is crucially important, and helps to understand how the system functions in three key aspects:

1. **Feedback:** The interchange of ideas peer-to-peer and teacher-to-student can help to modulate the flow of information through and between communities. A positive feedback can help to accelerate change; for example, good user experiences with new applications such as text messaging, YouTube, or blogging results in a rapid spread of new users seeking to share in the experience. Negative feedback helps to resist change and promote stability; for example, the dampening down of rapid adoption of new applications after a few bad experiences; or the modification of over-enthusiastic claims on a Wikipedia entry to achieve a general consensus or compromise position.
2. **System ecology:** The intricate structure of collaboration and complementarity between applications and users can be considered analogous to the functioning of a natural ecosystem, in that each part is, even indirectly, connected to every other part, and changes in one component will have a knock-on impact to other components. This is of supreme significance for course design, and illustrates simply the reason why adding new technology to ‘solve’ a course problem without considering the knock-on effects may simply create other problems elsewhere on the course.
3. **Self-organisation:** An important feature of complex adaptive systems is their self-organizing properties, known as community assembly. Web-based learning generally requires a high level of self-regulatory skills (Niemi, Launonen, & Raehalme, 2002). In part this is determined by technical features—whether one device can communicate with another—but with the growing convergence between devices, and between different software applications, this may be less of a problem in future. In part, also, self-organisation is user-defined, with learners selecting subject areas, levels, and modes of flexible access that suit their lifestyle or personal requirements—in effect, a specific ecological niche for each learner.

LEARNING OUTCOMES

It is well established in academic literature that a considered approach to designing distributed learning courses is to begin with learning outcomes.

As we become more learner-centred, instructors move from covering content to helping students master learning outcomes. This

transition can have profound impact on how faculty structure their courses and curricula, and generally leads to increased interest in depth of processing rather than breadth of coverage. (Allen, 2004)

Learning outcomes are specific understandings or skill sets that a student is expected to achieve at the end of a learning experience. They can be applied to a course, a program, or a complete degree. The use of learning outcomes as the focus of course design provides a rationale for the selection of resources and media.

Outcome-based education is a method of teaching that focuses on what students can actually do after they are taught. All curriculum and teaching decisions are made based on how best to facilitate the desired outcome. This leads to a planning process in reverse of traditional educational planning. The desired outcome is selected first and the curriculum is created to support the intended outcome. (Lorenzen, 1999)

The use of learning outcomes as a starting point for course design generally has become standard practice in UK higher education in recent years. At least four factors are implied in this approach:

- What the student is to learn must be clearly identified.
- This must be achievable and demonstrable.
- The course should provide multiple instructional and assessment strategies in order that each student can demonstrate what he or she has learned.
- The course design must allow adequate time and provide adequate assistance so that each student can reach the maximum potential (Towers, 1996).

A significant problem with this approach is that if the outcome-based approach is too rigid, it flies in the face of demands for more student autonomy in learning choices. How can it be a truly self-directed learning experience if the outcomes and the paths to these outcomes are pre-selected before the student even signs up for the course? We will come back to this in more detail in chapter 6.

ON LEARNING STYLES AND PERSONALIZATION

It might be useful at this stage to deal with the issue of individual learning styles. A considerable amount has been written on this subject but there appears to be little general agreement over definitions, or on how

to measure the variation claimed to be predicted in the models of analysis that attempt to predict an individual's learning style. Put simply, the theory of learning styles, or 'multiple intelligence' attempts to use a series of tests to predict the main way that a learner actually learns (e.g. the self-administered test at <http://www.ldpride.net/learningstyles.MI.htm>). It is generally accepted that people favour different ways of getting to know a subject: perhaps you like to find a quiet corner with a good book (text) or you prefer to see a practical demonstration on TV (visual). There is a difference between the person who prefers to learn by doing (experiential) to the person who likes to talk things over then think about it for a while (reflective). The controversy, however, begins when we attempt to reach agreement on how we measure these preferences and how robustly we can rely upon any measurements that suggest that a certain person *always* learns in a particular way.

The arguments for and against the concept of definitive learning styles have swung to and fro over recent years, but there is a broad, if reluctant, agreement that there *are* several different generic styles of learning, even if most educators baulk at the idea of designing course materials to fit rigid stereotypes. Against this background we have seen the evolution of increasingly sophisticated web-based software that enables complex user profiles to be built up to personalise the user interface for a variety of purposes. Personalised profiles are built up either by the user deliberately creating a record of likes and dislikes, or by the automatic recording of preferences as a result of the user's behaviour online. Common examples of user-selected personalised profiles might include the social networking spaces such as Bebo (<http://www.bebo.com>) and MySpace (<http://www.myspace.com>) through which users seek to communicate with other like-minded individuals online. An example of an automated profile might be the Amazon shop (<http://www.amazon.co.uk>) where the choices of the users as they browse or buy online are recorded in a database and combined with similar results from millions of other users to create a complex cross-matching of preferences that can sometimes be stunningly accurate. The more people use it, the better the service becomes. In educational terms, the incorporation of personalisation into course design is intended to facilitate opening up choice for the learner, although compared to the commercial applications the educational use is in its infancy.

A critical application of personalisation in relation to educational social networking stems from the desire to recreate the connectedness of the face-to-face environment in an online setting. In the desire to create effective online communities that can enhance the educational experience, a number of institutions are seeking to enhance the value of

peer-to-peer connections between remote students by enabling them to create personalised spaces online, usually behind well-developed institutional firewalls to deter unwanted intruders. Woods and Ebersole (2003) describe this as a form of 'communal scaffolding' that helps to bridge the gap between the cognitive and intellectual tasks of e-learning and the other (social and interpersonal) requirements of online education. A major role provided by the hyperactive web 2.0 technology applications is to engender and support the heightened sense of intimacy, group identity, and safe environment in which to participate in the learning experience. LaRose and Whitten (2000) identified three main sources of intimacy in online educational settings: (1) between teachers and students; (2) between students; (3) between students and the computing system (VLE) used to support courses

Significantly, although Woods and Ebersole detail numerous ways of enhancing intimacy online in the educational setting, they emphasise:

How do we transform a dialogue of texts into a community of learners characterized by intimacy and interconnectedness? Perhaps the starting place is to recognize that a positive social dynamic requires intentionality—that is, community online just doesn't happen but is created through the intentional use of a variety of verbal and nonverbal communication cues. Or perhaps we begin by recognizing that there are no shortcuts to developing community. In other words, it takes time, and there is no substitute for time spent in communication with others. (Woods & Ebersole, 2003)

Two further elements come into play here, even though they might initially appear to be occasionally contradictory. The flourishing of online communities requires the establishment of interpersonal trust, often between people who have rarely, if ever, met face-to-face. This trustworthiness is a common feature of online communities, educational, recreational, or business, but it is hard to define. In educational terms there is considerable experience to indicate that the level of trust required to stimulate a high level of sharing and open-ended thinking is most quickly achieved when the participants either know each other prior to joining the online community or when they come together face-to-face in an initial meeting. After participants have met in person, there seems to be a greater willingness to share and a higher bond of familiarity is achieved. In part this may reflect upon the second important element, which is the accuracy of the information contributed by the participants. Internet lore abounds with stories of people adopting other personalities online than they have in real life i.e. males pretend

to be female, older people to be younger, and so on. This may indeed be a common feature of chat-room communication, or it may be apocryphal and exaggerated, but either way the level of occurrence is difficult to determine accurately. In the commercial world, the accuracy of the participants is often judged by their peers, as in the credit rating applied to sellers on eBay, or the comments and star awards given to books, music and film on Amazon. In the educational world peer review is more generally based on the usefulness of the contributions made by participants, and it would be interesting to investigate whether the confidence of learners in the usefulness of the contributions of their colleagues is enhanced by being able to triangulate the usefulness between different social networking applications. For instance, if a learner has his or her interest raised by a useful-sounding contribution on a discussion board, follows it up by an exchange of exploratory messages with the contributor, then has a longer telephone or Skype conversation to discuss the issue in depth before submitting an assessment, does the contributor have a higher status 'credit rating' than a remote contributor with whom the learner has had no in-depth, multi-media communication? All of this is, of course, to a large degree dependent upon the learner's willingness to engage both with the learning resources and with the diverse media resources used for communication and sharing. It is a fundamental supposition of the design of distributed learning that learners will selectively choose the particular media (telephone, e-mail etc.) and the level of engagement (regular, enthusiastic participant, or lurker) that is most appropriate for their own particular situation. Their level and type of engagement may of course change several times in the duration of a particular block of study.

Cho, Gay, Davidson and Ingraffea (2007) drew attention to the fact that some academics are attracted to "the idea that individuals exhibit personality-like differences in their basic communication styles." They claim evidence in their studies for both individual and structural factors (i.e. communication styles and a preexisting friendship network) significantly influencing the manner in which learners developed collaborative learning social networks: "More specifically, learners who possessed high willingness to communicate or occupied initially peripheral network positions were more likely to explore new network linkages" (Cho et al., 2007, p. 309).

INDIVIDUALISATION VERSUS GROUP INTERACTION

This raises the issue of the value of social learning. In designing a course or module, how much should the educator allow the learner to custom-

ise, personalise, or opt out of course elements and how much should the learner be ‘forced’ to complete certain activities, share with peers, or submit fixed assessments? There is a tension between allowing the individual to select his or her own educational path—at the risk of the student drifting aimlessly between a random selection of superficial items of knowledge—and compelling the learner to learn in a very narrow, inflexible manner decided by the tutor or teacher. From the point of view of providing equity of access to learning resources as well as that of making best use of the resources available, it does not seem logical to avoid using one of the most diverse and flexible resources available on any course—the body of student participants themselves. Particularly when trying to encourage transferable skills such as teamwork, problem-solving, and articulate presentations to others, the design of learning activities that compels students to ‘practice what they preach’ and undertake these tasks together as a form of course assessment seems a natural example of good practice. Social networking tools, although not primarily designed for formal educational activities, are specifically designed to ensure an open flow of information, easy networking, and ease of use of technology in diverse contexts.

As we have said elsewhere, the generic term of *Virtual Learning Environment* (VLE) has become devalued, partly due to advocates stressing that the use of the word *virtual* is a derogatory term that does not acknowledge the real and intimate relationships that a good online learning environment can support; partly, also, the rapid evolution of the VLE now encompasses such a very diverse range of software applications, from very basic to extremely sophisticated, including the incorporation of independent social networking applications, that there is no longer a simple, clear definition of what a VLE should contain. For this reason, some educators have moved toward the term *course management system* (CMS) to encompass the ‘conventional’ VLE and also include a growing array of web-based software tools, activities, and course management procedures that can be described and specified in detail. In a paper addressing “the need for the development of an e-learning environment within a CMS that addresses learner’s diversity in terms of metacognitive skills, learning styles, prior knowledge, and cultures,” Vovides, Sanchez-Alonson, Mitropoulou and Nickmans (2007) made the case for course management design that emphasised the ability to allow students to personalise and customise their learning experience, rather than try to provide individualised paths to instruction. With an acknowledgement to dual coding theory, which proposes that multiple content representations enhance memory recall, the authors draw upon

the evidence of several previous studies to suggest why and how CMS design must support the development of self-regulated learners.

...the e-learning environment in a CMS should provide opportunities for students to learn how to: select, combine, coordinate their cognitive strategies in connection to the new knowledge, and [be] prompted to reflect on their strategy use, extending their metacognitive knowledge with strategy and capacity beliefs. Despite this strong recommendation, the CMS is often used as a 'one size fits all' service to learners, irrespective of their knowledge level, goals, and interests. All students have access to the same instructional material and the same web-based tools without personalised support. All students receive the same exercises irrespective of their pre-existing knowledge and experience. It is not taken into consideration that the educational material is presented to a large number of learners who have varied knowledge levels, skills, and learning strategies. (Vovides et al., 2007, p. 68)

For this reason, they stress that the student learning support within the CMS needs to be adaptive in order to foster and motivate student self-regulation in these highly flexible learning environments. In other words, leaving aside the danger that highly flexible learning environments may appear difficult and unstructured to some types of learner, we need to acknowledge that even many well-organised and powerful CMS are underutilised in their potential by students and by teachers, and both groups need to explicitly recognise that the development of self-organised, self-directed learners, playing an active role in their own learning, is the ambition of all educational courses. The design of the CMS needs to be structured well enough to scaffold learners who are hesitant in online education, yet responsive enough to adapt to the individual learning needs of students and allow them to open out individualised learning paths that are more contextually suited to the range of diverse learning needs, interests, and requirements.

Drawing from several previous studies, they attempt to synthesise the key features that a CMS should incorporate in order to deliver successful online courses, including;

- Availability of technology
- Reliability of technology
- Standards of course design
- Instructor (teacher) training
- Learning effectiveness
- Student satisfaction

- Faculty satisfaction
- Cost effectiveness
- Access

A fundamental distinction here, however, is the need to view these key features from the student-centred perspective, rather than from the tutor or the institutional view. The course management system needs to function as an interlinked system for the benefit of the learner, not a cluster of individually useful but stand-alone technology applications that are bolted together according to some personal philosophy, preference, or whim of the course tutor.

THE RESEARCH ISSUE

This review of some of the literature on blended learning and distributed learning suggests that course design should be student-centred, provide a flexible, interactive and dynamic learning environment, yet have a rationale for the choice of media and methods used on the course. Sharpe et al. (2006, p. 3) in a comprehensive review, found that “student response is overwhelmingly positive to the provision of online course information to supplement traditional teaching.” Individual case studies and evaluations of distributed learning courses abound in the literature (e.g. Langenbach & Bodendorf, 1997; Matheos & Archer, 2004; McConnell, Lally, & Banks, 2004), but remarkably few of these articles have a central focus on the design process, most preferring to report on student or faculty satisfaction with the results of the ‘delivery’ of a course or module. The research described here aimed to discover how course design for distributed learning takes place in practice. What rationale determines media choice? What assumptions do course designers make about students’ readiness to engage with particular media? What implications are there in terms of student support?

There are two key points to recognise before we embark upon a consideration of the actual practice of distributed learning, and these relate to an appreciation of the context of education. Firstly, flexible learning is not a new phenomenon. Ever since the first person sat by the fire with a course textbook to revise a topic that she or he had discussed or listened to in a lecture earlier that day, or the first person retired to a quiet corner of the library to re-read the hand-written notes that had been given out in an earlier tutorial, learners have been making use of different forms of learning material that are flexibly suited to their needs. This means, almost by default, that learning regularly takes place out of the formal course settings. The phenomenon of recent years

is that digital technology allows us a vastly more diverse range of high-fidelity forms of information that are able to be replicated and shared easily. It is the challenge of systematising the use and development of these new resources in a meaningful manner that is currently exercising (some of) the educational establishment today. In particular, there is an urgent need to mainstream the incorporation of digital learning resources as an embedded part of the curriculum, rather than simply regard them as resources to turn to in order to pep-up a course that has problems or is failing to interact with students in a satisfactory manner. The acknowledgement that much (most?) of our learning takes place outside the context of a formal course requires us also to acknowledge that the sorts of tools that children of all ages, and young techno-savvy professionals are using extensively in their leisure time may (some would say must) have a valuable contribution to make in the parts of their lives given over to more structured educational activities.

In their discussions on flexible learning, Collis and Moonen (2001) identified four key components of flexible learning:

- Technology
- Pedagogy
- Implementation strategies
- Institutional framework

They then quote from previous work, identifying 19 “dimensions of learning flexibility,” and note that this is not intended to be an exhaustive list. Significantly, only one of the 19 dimensions is specifically concerned with the distance between the tutor and the location of the learner.

A summation of flexible learning by Collis and Moonen focussed upon the benefits to the learner:

Flexible learning is a movement away from a situation in which key decisions about learning dimensions are made in advance by the instructor or institution, towards a situation where the learner has a range of options from which to choose with respect to these key dimensions. (Collis & Moonen, 2001, p. 10)

CHALLENGES FROM THE INSTITUTIONAL PERSPECTIVE

So far we have largely addressed distributed learning and social networking from the perspectives of the students and staff, but in reality, of course, the enthusiasm and motivation (or lack of it) that the staff

have for new educational technology is fundamentally influenced by the corporate attitude(s) of the educational institution as a whole. This is particularly the case with the highly interactive, peer-to-peer, and cross-institutional applications of web 2.0.

Web 2.0 is a potentially disruptive technology because of its potential to change the model of higher education from the traditional classroom framework to an asynchronous 24/7 mode. Institutes of Higher Education historically do not cope well with disruption, especially in the short term; however, coping with this disruptive force could mean engaging students in extended collaborative learning opportunities. From this perspective, the perceived disruption could entail many positive implications for higher education. (Thompson, 2007, p. 5)

This optimism is not always fully shared. Concerns among the educators generally centre on a combination of four key areas of potential conflict:

- Administrators may regard online learning solutions as a way to cut the costs of “traditional” education.
- A move toward online tuition is a way of cutting jobs and diluting subject expertise.
- IT service staff may be antagonistic toward more open or flexible Internet applications that they might perceive as being a threat toward institutional security or simplicity.
- Academic staff may feel that they are not well trained or prepared for the adoption of new educational technology in their subject area.

The first two areas of concern can largely be answered by a mature appreciation of the development of online learning. As more and more of the curriculum in an increasing number of higher education institutions has moved online, a truer assessment of the actual costs of online learning systems has evolved. While the subject is still hotly contested in some quarters, it is now generally agreed that the true costs of online development are certainly no less than the true costs of traditional development, and while the investment in both is largely upfront (in software and content or bricks and mortar) it has historically proved easier to gain funding for brick and mortar, though the near ubiquitous access to the Internet may change this. Certainly, a willingness to experiment with new business models for higher education delivery, even for traditionally face-to-face students, would seem to be a prerequisite for success in the Internet age. Even here, however,

a form of social networking is emerging, with numerous consortia of educational institutions coming together, even temporarily, to share the development, and frequently give various levels of public access to, newer generations of online resources, templates and tools. This has been encouraged by the growing scale and complexity of web-based applications, which have spread the cost, and risk, of development over several institutions; the increasing popularity of open source solutions; and the recent trend among educational funding organisations to place a premium on the added-value of interinstitutional collaboration rather than fostering competition over smaller and smaller areas of educational turf. Examples of this collaboration can be seen in the transnational developments such as the EU-funded Generation Online Adult Learning (GOAL) project in the nonformal education sector at <http://www.belfastinstitute.ac.uk/goal> and the ‘pedagogic planner’ for higher education funded by the Joint Information Systems Committee (JISC) at <http://www.wle.org.uk/d4l/> Given the nature of the evolving scale of online learning activities, it seems likely that multi-institutional collaboration in the development of online learning and social networking applications will be *de rigueur* in the foreseeable future, with an emphasis upon designing the technology to suit the pedagogical requirements, rather than vice versa. Lamb (2007) concluded that:

Educators and higher education decision-makers have an obligation to carefully and critically assess new technologies before making radical changes. Taking a more freewheeling approach to content reuse and making campus technologies more accessible to data mashups require significant changes in existing practices and attitudes. These changes won’t happen quickly or easily. (p. 22)

Critical to our vision in this book, however, he also speculated about “What might happen if we allow our campus innovators to integrate their practices in these areas in the same way that social networking application developers are already integrating theirs?” and suggested that there may be different levels of collaboration to safeguard ‘mission-critical data’ ranging from selected development consortia to full public disclosure.

CONCLUSIONS

We began with a review of various definitions relating to the increasing flexibility in the design of learning resources and suggested that the term *distributed learning* should be used to describe learning resources

that seek to optimise the flexibility to a diversity of learner types, in location, time, and type of media access to educational support.

The distributed learning opportunities within a course management system need to address the diversity of learners' requirements in terms of prior knowledge, learning styles, metacognitive skills, and cultural context. The new requirements of flexible course management systems and online social networking opportunities for learning have shifted the focus of the tutor from a teacher to a facilitator of learning.

Although some of the responsibilities of this new role remain similar—guidance, knowledge of the subject area, supervision, and advice on sources of knowledge—two areas in particular are new and potentially challenging for staff: (1) the power shift in favour of student-directed learning, and (2) the requirements to understand and master the full capabilities of the new technological applications.

In order to support both staff and students, educational institutions need to develop a support strategy for the use of their course management systems, and a realistic mechanism to adequately support this strategy.

3

SELECTING THE MEDIA PALETTE

So where do we start when we want to actively plan for the incorporation of educational technology in a course in order to facilitate learning, not impede it? The Electronic Training Needs Analysis (ETNA) in Scotland (Dailly & Price, 2007) surveyed the situation in the Further Education network and compared this with previous surveys in 2001 and 2003. Among the many conclusions and recommendations noted, three stand out as generalities that could be applied to the entire formal education sector:

1. The enormous development of the technical capacities of IT systems, even over the previous six years since the first survey;
2. The hugely improved access (individual and institutional) to online resources and networks; and
3. That “the rapid pace of change presents a challenge to staff in simply being aware of the possibilities presented by new technologies” (Dailly & Price, 2007, p. 7).

Two further points, explicit in this study—and reinforced time after time in interviews for this book—have a major importance for this chapter. Firstly, though most institutions now have a virtual learning environment (VLE) (some operate routinely with two or three platforms) staff are often confused over the function of the VLE and do not consider it essential to carrying out their role. Secondly, staff and students frequently have better (less restricted) access to online resources at home than from their institution, a cause for concern if we seek to relate learning to the real world and exploit the best of technology to improve education. We will come back to both of these points later.

The fact is that “the environment of higher education is changing rapidly. Costs are rising, budgets are shrinking, and the demand for new services is growing” (New Media Consortium, 2007). In a rare case of rhetoric living up to reality, increasing globalisation *is* changing the way that we work and communicate, and this means that research, scholarship, and learning are not exempt from the significant shifts that are being unleashed by web 2.0 and beyond. Philip (2007) tried to summarise these changes by what he calls the “knowledge building paradigm” and related this to his perception of the changes that are happening among “the Net generation” in business, society, and education. In particular, he noted earlier work by Tapscott (1998) that identified interactivity in the learning process as the key characteristic common to these changes, and listed eight areas for attention:

- From linear to hypermedia learning,
- From instruction to construction and discovery,
- From teacher-centred to learner-centred education,
- From absorbing material to learning how to navigate and how to learn,
- From schooling to lifelong learning,
- From one-size-fits-all to customised learning,
- From learning as torture to learning as fun, and
- From the teacher as transmitter to the teacher as facilitator.

Other researchers (Lohnes & Kinzer, 2007) emphasise the fundamental importance of the learning context, and caution us against making overly generalised assumptions about the learning preferences of even the digitally literate students—variously described as “the Net Generation” (Obliger & Obliger, 2005), “Millennials” (Howe & Strauss, 2000), and “Homo zappiens” (Veen & Vrakking, 2006). The latter authors also stress that learning is not simply a one-way process. In an attempt to tease this out, we propose the following matrix as an early working plan to identify various ways in which educational technology can be adopted to enhance the process of interactive learning (see Figure 3.1).

HOW CAN MEDIA BE BEST USED IN DIFFERENT CONTEXTS?

Not all learners want to engage with all of the learning technology resources, so it is important in course design to be clear about what is “need to know” (i.e. watching a chemistry experiment—face-to-face or on a video-clip) and what is “nice to know” (adding depth, offering

Interactive Learning
A Matrix of Educational Technology Options

Media	Basic	Intermediate	Advanced
Text	One-way Print	One-way Webpages	One-way Blogs
	Interactive e-mail	Interactive Computer conferencing	Interactive Wikis Blogs
Audio	One-way Audio clips	One-way Podcasts	One-way Ipod downloads
	Interactive Telephone support	Interactive Telephone conferencing	Interactive Audiographics
Images	One-way Photographs	One-way CD/ DVD	One-way Animations
	Interactive Image banks, e.g., SCRAM, Creative Commons	Interactive Share and edit, e.g., Flickr, SplashCast	Interactive Simulations/games
Video	One-way Video clips	One-way Annotations?	One-way Vods
	Interactive Webcasts /TV	Interactive Skype	Interactive Videoconferencing

Figure 3.1 Some examples of using educational technology for one-way and two-way learning

alternative explanations, or simply providing additional resources to allow specialisation). A good starting point for what can be considered effective practice in the utilisation of new media in an educational context is in the introduction of a report on this subject (Joint Information Systems Committee [JISC], 2004, pp. 10–11) that states:

[effective practice] should;
 Engage learners in the learning process
 Encourage independent learning skills
 Develop learners' skills and knowledge
 Motivate further learning

Nothing new, you might say, that is not already covered by good 'traditional' education that makes little or no use of educational technology. The authors go on to add context by noting that:

...in the broadest sense, effective learning is likely to occur when opportunities to learn involve:

- The right resources
- The right mode [or blend of modes] of delivery
- The right context
- The right learners
- With the right level of support

Again, this could be considered a truism, but the crucial point to appreciate is that, in the Westernised countries at least, the changing nature of society means that what were 'the right resources, the right mode...' for learners 20 or 30 years ago are not necessarily the same for learners today. The reasons for this have been well rehearsed (e.g. Castells, 2001; Rheingold, 2000; 2002) so there is no need to go into the issues in depth here, but a few self-evident examples might refresh the memory.

- Even elementary school pupils are utilizing digital media resources in their learning activities and are approaching higher education with different aspirations than did their parents regarding course learning materials.
- Job mobility and skills transferability have created greater expectations of lifelong learning opportunities.
- Greater numbers of part-time and mature students are returning to learning in subjects or institutions previously dominated by residential, full-time students straight from high school.
- Financial considerations frequently mean that learners need to work full- or part-time, cannot/will not travel to study locations distant from their home/work, and want to pay for studying only what they consider useful for their personal or career ambitions.
- At the risk of using hyperbole, the Internet was in its infancy 20 years ago, and the web did not exist. Regardless of whether you think it is good or bad, it has changed the way that we think about and access information, not simply for education, but for entertainment and work as well.

There is a continuum between enthusiastic early-adopters of new technology who will immediately experiment with every new application and those who stridently (and unreasonably?) resist all forms of new fangled ideas and technology. We think that it is important not to fall into either of the two extremes: the teacher who appears to be infatuated with each new technology and experimentally tests it on learn-

ers without adequately weighing up the strengths and weaknesses; or the neo-Luddite who disadvantages the learners by eschewing *any* new technology and claiming his or her subject is “different” and that therefore it is not easy to incorporate new ways of utilising digital learning resources.

EDUCATIONAL ACTIVITIES TO ENGAGE LEARNERS

As we noted in chapter 1, the essence of online collaborative course design is the use of activities appropriate to the subject and level of the learner. For a course designer it is critical to think of pedagogic models in terms of, first, “What do I want the learner to be able to do?” (transferable skill, contextual understanding, etc.) and only then “What tools (technology?) do I have at my disposal that will help the learner complete these learning activities?” It is one thing to be aware of the strengths and limitations of a particular technology and another to be able to translate these elements into learning opportunities for a student.

In attempting to define a learning activity as “an interaction between a learner and an environment, leading to a planned outcome” the authors of the JISC report (2004) acknowledge that practitioners have always planned activities for learning but also that the new technology-rich environments offer a greater diversity of available options. Different approaches to learning concentrate upon different assumptions about how people learn, and different pedagogies that might support this learning process. This may lead to the adoption of different learning activities being prescribed (e.g. to include mobile or wireless technologies; see JISC, 2005) but there is a great deal of generic overlap that can be applied in varied educational situations and they have listed the associated pedagogy with four approaches to learning:

1. **The associative perspective**—based on the assumption of learning as acquiring competence.
2. **The constructive perspective**—assuming that learning is based upon achieving individual understanding.
3. **The constructive perspective**—assuming that learning is based upon social collaboration to achieve understanding.
4. **The situative perspective**—assuming learning as a social practice developed through participation in specific communities and practices.

It is important, however, not to be too simplistic in this and ensure that course designers do not select media simply in an attempt to replicate a digital version of the face to face environment with which they are

more familiar. We have chosen the term *distributed media* for this type of resource, meaning that the type of medium itself can support learner access across a wide spectrum of geographical locations and time constraints, thus effectively distributing the medium among many users. This distinguishes the resource from a non-distributed medium, such as a face-to-face lecture or conversation that *only* occurs at a particular locality, at a particular time, and, if it is not recorded or repeated, is not able to be distributed spatially and/or temporally. Each distributed media resource comes with its own set of strengths and weaknesses, advantages and disadvantages that when combined in a structured ecology of learning resources can produce quite a different effect from the original intention. In the following table we attempt to illustrate some ways by which generic learning needs can be matched to student learning activities, and how these activities might be facilitated using different levels of engagement with the media of distributed learning.

Three points should be stressed here: The table above is *strictly* to illustrate the possibilities. It is not a prescriptive document or a blueprint for course design. There is no presumption that the move from fundamental to emerging is either a more advanced trajectory or an inevitable progression for all courses. In reality, it is the learning activity that should dictate the outcomes, there may well be an intimate mixture of fundamental, extended, and emerging media used to provide a rich matrix of possible learning resources on any course or module.

HOW CAN DISTRIBUTED MEDIA BE BEST USED?

This is a difficult question because there is no single ‘correct’ answer. There *are* lots and lots of ways to combine distributed media, new technology (software and hardware) and educational applications, but there are so many variable factors that it is almost impossible to say “do this, and it will be successful.” There are, however, some guidelines that can increase the chances of creating successful combinations of learning resources, while at the same time permitting modification or adjustment and encouraging innovation. The rest of this chapter will concentrate on how course designers can best utilise different media to present learning opportunities in different contexts.

To begin with, it is important for course designers to appreciate four fundamental ‘rules’ when considering the use of social networking technology to facilitate distributed learning.

1. **No panacea**—The adoption of new technology or social networking applications should not just be in response to perceived problems with an existing (face-to-face) course. It has become apparent to us

Table 3.1 Examples of the Application of Distributed Media to Learning Activities

Student learning need	Example of student activity	Level of distributed media resource		
		Fundamental	Extended	Emerging
Information handling skills	Web searching Using electronic libraries	Print	Webpages	e-books Digital repositories
Developing understanding	Linking information from different sources	Connected document (with hot links)	e-portfolios	Mashups
Linking theory to practice	Learning by doing	Online quizzes	Instant messaging tutorials	Screencasting
Practicing discussion and argument	Presentation	CD/DVD	Photos/images Online debate using threaded discussion (Flickr?)	Vlog
Sharing essays online				
Practicing articulation of ideas	Reflective journal	Computer conferencing	Blogs Videoconferencing	Podcasts
Rehearsing skills and procedures	Audiovisual essay	Audio clips (Powerpoint)	Video clips	Webcasts YouTube
Practicing teamwork	Group projects	Online games	Social book-marking	Wikis
Learning professional practice	Problem solving exercises	Role playing	Animations or audiographics	Simulations
Feedback	Interactive Tutorial	Telephone support e-mail	Telephone conferencing	Skype

in the research for this book that a substantial number of educators, upon realising that they have problems with an existing course that they teach (e.g. poor student retention, lack of student participation in assignments, poor attendance at lectures), decide to graft on a piece of new technology that they feel will solve the problem. As a result, handouts from lectures or tutorials are pasted onto a website without modification from the face-to-face class; discussion boards are established to force students to talk to each other; papers and articles are

posted online (on the VLE?) to encourage students to read more. This is the equivalent of throwing a lifebelt to a drowning man—it may work, but it is better to have prevented him from falling overboard in the first place. The introduction of distributed media resources needs to be a way of creating new opportunities for sharing and extending learning, rather than constraining learners into different forms of learning participation.

2. Pedagogy first—Before selecting your new technology for interacting and/or communicating with the learners, be sure that you fully understand your educational goal. The applications that we will describe in chapter 4 can be used in a variety of ways in different situations—what works in one context will not necessarily work equally effectively in another context. This does not mean that there is anything wrong with the application that you have selected, nor necessarily with your learners, but due to other factors, the combination may be inappropriate for the task that you would like the learners to perform.

3. Initial induction—Whatever combination you select, even if it is apparently a very user-friendly technology, such as contributing to a wiki, or using SMS text-messaging, which many people use in the nonacademic parts of their life, you need to provide some initial induction training for students. The key point is that learners should be completely comfortable with the new technology so that they can concentrate on the learning experience rather than being distracted by their discomfort with the technology interface. The induction to the ecology of learning resources need not be face-to-face, though some teachers argue that initial face-to-face contact makes subsequent online interaction less intimidating for some learners. Variations of online induction could include detailed written instructions by e-mail; a screencasting of the mouse movements to select menus, download software etc.; a little video clip or podcast talking the learner through an activity; or simply a telephone conversation (one-to-one or teleconference) with the learner to guide him or her through the initial process of gaining access to and navigating through a series of online resources.

4. Need to be serious—The applications of new technology and the learning activities that require the use of distributed media need to have a clear learning purpose that is transparently related to the course of study—they need to be real examples that are worthwhile doing. Students, particularly mature students and students that are paying their own way through university are increasingly strategic in the use of their time. If there is a point to the learning activity, and they can clearly see a link between the task that they have been set and the final assessment or grade that they are likely to get, then they will respond

enthusiastically. Otherwise they will spend their scarce time and attention elsewhere. As Goldhaber (1997; 1998) has argued in his work on “the attention economy”, information is a commodity, and in the digital age we are often swamped by this commodity, so the more scarce resource (the ability to grab our attention) becomes the more valuable commodity. This is simply saying that the course assessments need to clearly relate to the intended learning outcomes of the course, but in the hurly-burly adoption of new technology this important aspect of course design often gets overlooked.

Let’s look at how these guidelines might relate to practice by reference to a specific example. In Table 3.1, as an example of an emergent technology being utilised to support group project work, we proposed the use of a wiki. Although wikis have been around for a decade, their adoption for academic use has been comparatively slow—surprising considering their power and flexibility (Mader, 2006b; Notari, 2006). A wiki is simply a website that can be quickly and easily edited by many people so, as a piece of social networking software, it is ideal for encouraging group collaboration on a document or project (Mader, 2006a). But we are getting ahead of ourselves.

As noted earlier, the social constructivist approach or situated perspective of learning claims that, in general, learning is based upon social collaboration to achieve understanding. If this is our belief then we may want to construct a learning activity in which our students are required to work together, sharing tasks, to produce both a group product (say, a project report, or a group presentation) that will both demonstrate their team-working skills, but also provide evidence of their own individual contributions towards the product (perhaps a reflective essay, or a project diary). In the 1980s, the effective solution would probably have been limited to a process that brought the group physically together in the same room a few times, got them to discuss their ideas, partition the workload, probably go away somewhere else to prepare their individual contributions, then meet again several times to produce more refined iterations of their collective work. Today, this is still a viable option, but the application of this solution is more constrained, and other options are also available. It is constrained because it depends upon the students being able to physically get together at the same place and time—and for many students who are not co-located, and who have pressing work or family commitments, this is not a real option. Fortunately, the collaborative features of wikis make them especially suitable for use in co-operative learning environments (Schaffert et al., 2006).

In a review of the wiki as a teaching tool, Parker and Chao (2007) examined the current literature and gave numerous links to examples

of how wikis are being used in practice, and suggested some additional uses. Significantly, the situation has changed slightly since even their paper was accepted for publication, and some of the attributes that they list as problems in the use of wikis (such as not being able to lock certain pages against change; keeping a wiki private to a known group of contributors; and ‘freezing’ a wiki when it has evolved to suit its end purpose) have since been overcome and are freely available as management options on the newer versions of wiki software. Duffy and Bruns (2006) summarise the uses of a wiki as follows:

- To develop research projects—using the wiki for ongoing documentation of the work.
- Building an annotated, collaborative bibliography—using links to prescribed reading and also to summarised notes on the reading.
- For publishing course resources—teachers can post handouts and students can post comments on these to be shared by all.
- To map concepts—ideas can be posted and edited to produce a linked network of resources.
- As a presentation tool—photographs, diagrams, and commentary can be presented on the wiki, and then subsequently edited to produce a revised version.
- For group authoring—creating and editing a single document by many authors that represents the views of each individual, but achieves a consensus.

In each of these examples the educational process and the required output(s) come first, the wiki is just an alternative solution to face-to-face meetings, with the advantages that the wiki is asynchronous and builds a written record of the interactions.

In the first example above, on the use of wikis in groupwork, the individual students might be required to provide evidence of their own contribution to the group project. In the past this might have been done solely by producing a written justification, and while this is still an option, the use of a blog might be more appropriate. Unlike a wiki (which is normally multi-authored), a blog (from weblog) is usually the product of a single author, frequently presented like a diary, but a blogger has the ability to make links to other online resources and invite other bloggers to comment on their initial postings. As wikis and blogs converge, the barriers between them blur a bit, and now it is common for many blogs to provide an opportunity for other readers to make their own comments on the blog owner’s comments, to link with their own blog spots, and to suggest links for like-minded readers

to investigate. For a real example of pupils and teachers talking about the use of blogging in their academic lives, see the short video illustration at http://thinklab.typepad.com/think_lab/2007/06/have-you-watched.html. The spread of blogging has resulted in two main types of blog, the one-to-many diary type conveying the owner's comments and opinions (with or without comments from other readers), and the many-to-many message-board type in which many readers respond to an original comment or article by posting their own comment, creating a rich dialogue of experience. The latter has been extensively utilised by news agencies to gather news from the grassroots, share it as it is happening, and seek comment from other readers (see the *Guardian* blogspot at <http://blogs.guardian.co.uk/index.html>).

To return to stages of course design, if we want to encourage our students to practice the articulation of their ideas, and to learn to share and comment on the work of their peers, then we start with this objective and consider what learning activities could help to achieve this. There are several ways to facilitate this of course. In a classroom we might stage a whole-class discussion, encouraging learners to offer different perspectives, answer questions, provide some answers, and generally share their experiences. In an online environment this might better be accomplished by using a computer conferencing system or a discussion board on a VLE, where learners and teachers can post their comments, responses, and questions on particular topics over a set period of time. If our preferred objective is to encourage the learners to produce a reflective journal as their learning activity, then a blog might be considered, with the added advantages that it can be shared with peers, and that both peers and teacher(s) can add helpful comments and/or questions, almost like footnotes to the main text. Similarly, if the main object of the learning activity is to encourage the student to practice the clear verbal articulation of their thoughts, then a podcast, a simple audio recording available over the Internet, might be an alternative to a conventional face-to-face presentation.

Each of the design solutions above, in addition to the previously stated advantages of enabling learner participation 'as and when' (i.e. asynchronous and not location specific) have the additional benefit for the whole group of learners that they can provide a detailed record of the learning activity. Unlike a face-to-face discussion in class, which is spontaneous and generally unrecorded, the online version generates a written (or audio) record and allows time for the learners to consider previous comments and offer thoughtful additions (unless, of course, a spontaneous live response is required as part of the learning activity, in which case a distributed live session such as a chat room, an instant

message session, or a Skype exchange could be selected). The written and audio records allow learners to reflect upon the learning session or topic, provide materials for slower learners or for revision, and can be archived for a period of time. With the addition of teacher notes to the learners' work, additional resources such as further reading, specific examples, and breaking news of relevant events can be made available for faster learners or those who would like to specialise in a particular aspect that is not fully covered in their present course.

To continue with our staged process of matching learning objectives and activities to more flexible uses of distributed media, the use of images is apparently particularly problematic. We say this because, although fully aware of the vibrant added-value that images (still and moving) can bring to a learning resource, we have also been struck by the apparent compulsion to use images in inappropriate circumstances. A classic example of this is the use of videoconference facilities. With the spread of the ability to link videoconference equipment over the Internet (IP connections) rather than by landlines, there has been a growth in the adoption of videoconferencing as a tool for teaching and the dissemination of research. While there are many fine examples of teachers playing to the strengths of this new medium—the ability to bring intimacy to a discussion among distributed participants; the ability to support multi-way interaction among the group; to bring in guest presenters from geographically distant localities; to record and archive the session for future re-use; there are also many examples of bad practice. Two bad examples stick out as being particularly common: the delivery of a video lecture, where the teacher simply talks at the students for an hour (or more!) in an attempt to replicate the experience of the lecture theatre. This completely ignores a key strength of videoconferencing, the ability to have quality time for visual interaction. Quite frankly, in many such cases there is no need to see the teacher at all, and the lecture could better be delivered as an audio file. If visual images are essential to such a presentation, then the session can be delivered once, recorded, and made available as a webcast on the course website (or on a DVD) for asynchronous, geographically distributed access. Alternatively, if the teacher really wants interaction with the learners and visual contact is not essential, then perhaps a scheduled teleconference is more appropriate, the telephone being more ubiquitous and more mobile than videoconferencing hardware.

A second example involves trying to run a videoconference session with the same meeting etiquette as a face-to-face meeting. The strengths of the medium, being able to participate live with peers and observe body-language/facial expressions without being co-located, need to be

balanced by an awareness of the disadvantages. Foremost among these, paradoxically, is the need to be inclusive in the group interaction process. The immediacy and collegial familiarity of the videoconference medium can sometimes lure participants into behaving as if they were in a face-to-face meeting, leading to several traps for bad practice:

Bringing a handout to the meeting and passing it around the participants in the same room with you, but neglecting to circulate this in advance so that your distributed learners/colleagues could print it and bring it along to the videoconference.

Failing to clarify the identity of everybody who is participating in the meeting and checking if they can all receive the signal clearly (we tend to assume that everyone in the same room can hear us when we speak).

Asking undirected questions such as “Any questions on that?” When we ask that in front of a videoconference camera, who are we asking? Students either tend to hesitate and say nothing, waiting for someone else to speak, or else everyone speaks at the same time. Better to ask, “Any questions on that?” in each remote site.

Conversely, teachers and other confident speakers often seem to need to fill the quiet gaps by talking, making it difficult or awkward for other participants to interject. Normally on a videoconference the remote camera is open on the person who is talking, so we cannot usually see the body language of the other participants who are waiting their turn to speak. Tutors need to be sensitive and directive on this.

Unfocussed or rambling agendas are bad enough in face-to-face meetings, but their uselessness is magnified online. Videoconference sessions need to be more organised than face-to-face equivalents, not least because institutions that make heavy use of videoconferencing will have strict time slots and if you over-run your allocated videoconference session because you have allowed people to ramble on, you will be cut off at the end of your pre-booked slot. You will be cut off regardless of whether you have come to the end of your agenda, whether you are a professor or a first year student, or whether a participant is in mid-sentence or not.

Tutors need to be aware of these limitations and plan for them, and in the best of cases the good videoconference session can be transformational, but a bad session can be truly pointless. A key point to note here is that the introduction of web 2.0 technology (in this case the ease of introducing hyper-interactivity through Internet-based videoconference connections) is not enough in itself to bring about a pedagogic

change. The application of the new technology requires a corresponding shift in other components of learning and teaching (e.g. in this case, a shift from the tutors 'broadcasting' their own opinions as a video monologue, to a learning session where students are encouraged/facilitated to interact with the tutor and with each other to maximise the educational advantages of interactive 'live-time' sound and video).

The use of videoconferencing is a starkly obvious example of the need to combine changes in the manner of teaching and learning when changes in the media of communication and learning are introduced; but, though they may be more difficult to distinguish, similar lessons apply to using other forms of web 2.0 applications for education. We have previously described this as an ecology of learning with similarities to the functioning of natural ecosystems in that everything is connected to everything else and changes to one element will often have profound (even unpredictable) effects on another part of the system (Rennie & Mason, 2004).

Another familiar example in course design might be the use of still images and photographs as learning resources. Anyone who has used the web a lot will be familiar with the frustration of clicking on a web page and having to wait for ages while an embedded photograph is downloaded, only to discover that, apart from looking attractive, the photograph does not really add anything to the text. Broader bandwidth might allow us to download these images faster, and web 2.0 technologies might allow us to share and manipulate the images with online colleagues, but frequently we are still trying to graft new technologies onto old ways of thinking about learning resources. (A photograph looks good in a book at this point—to break up a long piece of text—so I will stick a photograph onto the website at this point.) As with our example of videoconferencing, course designers need to fundamentally re-think the incorporation of web 2.0 learning resources into the ecology of the overall learning experience. Consider the following real life example that was shared with us during the preparation of this book:

I'm a Programme Manager on the **** e-learning team. I have responsibility for the **** e-learning transformational projects and some new projects in the innovations strand on gaming and mobile technologies. I am interested in the use of social software in a learning and teaching context and have worked with wikis and blogs in an HE institution. I am an addict of flickr.com, my del.icio.us and have just started a combined photo/text blog.

I have done most of my recent and most effective learning in a very informal space—on Flickr. I could have taken a formal photography course and did consider doing so. However for me,

in this instance, a qualification is not the important outcome—it is the learning. Flickr can be used in so many ways—as a store for images, as a social space, and as a place to share content.

But it's the incredible power of the social aspects in self-organised groups that can be very powerful. There are groups that provide information (e.g. what kinds of films work in which contexts, or technical aspects of cameras), discussions (e.g. around the work of a particular photographer or genre), workshops where assignments/activities are set (sometimes with deadlines) and where we can comment or critique each other's work, games, competitions, combining creative writing with images, how to use Photoshop, etc. etc....

What I love to see is where people work collaboratively to produce images, where people tag each other's images, where people link up with other people with similar styles.

Not only that, I have made friends who I meet virtually and some who I now meet physically.

Flickr is my own university where I have choice and control. You could argue that Yahoo (who have taken over Flickr) could take that away from me and my fellow Flickr learners. Yes, they could, but we would just find another way to do it with some other software. It's not the software, or even the service (which I do pay for) but the community of people that support my learning.

Lou

p.s. After posting it I was reflecting further, and what I wanted to add, but never did, was that—in that environment/learning space I am both a learner and a teacher, because I think that whole issue of blurry, moving roles is so very significant with web 2 stuff. The other thing I nearly added was that I'm 46—just to highlight the fact that it's really not only young people using social software in that way. (Lou McGill, personal communication)

There are many significant issues that emerge from this e-mail—the exploitation of informal learning; the interest in the learning rather than the qualification; the learning aspect of online communities of enthusiasts; the blending of online and offline relationships; the blurring of distinctions between learner and teacher; the significance of age and gender in the digital divide. A key point for us, however, is the recognition of the almost serendipitous learning experience that is enabled by the flexibility of the media resources. A person can embark upon a simple task, not necessarily related to learning—such as taking photographs and sharing them online. This may lead to the establishment

of online links to similar enthusiasts, and to the development of communities of interest or communities of practice. As the person pursues a particular personal agenda (e.g. how to improve the quality of their photographs) the online interactions become more specific, perhaps seeking help, or being referred to useful sources of information, or 'dipping into' more structured photographic information such as an online course or manual. The learning activities, and to some extent the learning experience as a whole, is shaped by the learner, rather than a tutor dictating what they feel that the learner should know.

There are limitations to this of course. The appropriate resources may not always be available, or the community may not know of the existence of relevant resources. The danger of just-in-time learning as opposed to just-in-case learning is that the experience for the learner may be partial, incomplete, or at worst misleading. A pick-and-mix education requires that the learner is facilitated/encouraged to have an analytical approach to his or her own learning, and to view each learning activity in an appropriate context—quite a difficult task to perform on your own. For the course designer the trick is to maintain the flexibility of the pick-and-mix counter to allow optimum opportunities for self-directed learning, while at the same time providing signposts to appropriate learning resources, giving feedback on learning activities and tasks, creating opportunities for the learner to contextualise new information, and providing support by enabling knowledge to be articulated, shared, and redefined.

Returning to the earlier mention of Goldhaber's "attention economy", the prime advantage of being able to use diverse types of distributed media learning resources is that they can grab the attention of students and provide alternative ways to promote concepts or share knowledge in ways that learners find easy to assimilate. Notwithstanding our earlier scepticism about the value of being over-focussed on identifying an individual's particular learning style, it is clear that we all assimilate knowledge slightly differently at different times, in different subjects, and in different contexts. The drive to provide learners with a more flexible and more diverse range of alternative learning resources is largely a drive to contextualise learning and to shift the responsibility away from being solely teacher- or institution-led learning to a relationship in which the learner has a far greater responsibility and shared control of the learning process.

So how do we know that distributed learning and social networking using web 2.0 is not just inundation by another new technology? Anyone who has come back from a few days holiday to discover 450 e-mail messages has a right to feel circumspect about being swamped

by the addition of new technologies. For anyone who experienced the early days of the Internet and can remember the delight in receiving a new e-mail from a distant colleague, or remember the awe of discovering the almost sci-fi technology of computer conferencing, the choice of technologies available today might seem to be a gimmick-driven overkill. But we are sure that this has been said of every new technology, as the car replaced the horse-and-cart, or the telephone replaced the telegraph cable, so the lesson is to look closely at the advantages and disadvantages of new forms of digital learning resources—not simply as stand-alone applications, but in combination with the other learning resources being proposed for the ecology of learning. We also need to be aware of the gap between the potential of technologies and their actual use, and we will try to address this in chapter 5.

Several authors have drawn attention to the fact that when the learner is given a greater diversity of choices, there is a correspondingly greater emphasis placed upon the teacher to be responsive to individual learning needs and to some extent personalise the learning experience, rather than just planning and delivering a set body of knowledge. Significantly, Collis and Moonen (2001) noted that:

Thus more-flexible learning for the learner brings more options to the instructor as well, although not always reflecting the instructor's choice but rather in reaction to the learner's choices.. (p 14).

Certainly there are significant challenges in offering a diversity of learning resources to students while still keeping the course manageable for the teacher and the institution. Equally, although there are concerns regarding the inappropriate grafting-on of new technology to courses without careful consideration of how this might alter other elements of the course, the response is not simply to do nothing, ignoring the potential benefits of new applications to help learners understand through the contextualisation of different resources. It follows that the process of matching new technology applications to satisfy particular learning outcomes and carefully selected learning activities means that we need to be aware of the strengths and weaknesses, the advantages and disadvantages of each of the new forms of distributed media resources. We will try to summarise these in the following chapter.

One final point; resist the temptation to go for technology overkill in course design simply because you can. As we have tried to emphasise, the introduction of new technology and distributed media to course design can provide some very effective ways to communicate with students or colleagues and share powerful resources, but there is no compulsion to use all of these media on the one unit or module.

Although the incorporation of distributed media can provide alternative ways of learning, and can even improve learners' access to learning resources that have previously been restricted to specific places (e.g. by the digitisation of print resources commonly held only in a specialist library) these should not be regarded simply as a replacement for the main face-to-face delivery of resources. Rather, they should be a well-designed improvement that extends the range of learning opportunities to all students, regardless of their geographical location or their ability to attend classes in physical terms. This means that the introduction of wikis, blogs, podcasts, discussion boards, and so on needs to be carefully balanced as part of a symbiotic learning system that brings benefit to the learners, rather than confusing, intimidating, or undermining their confidence. Consider the important learning activities, match them with the strengths of a particular distributed medium, perhaps provide some alternative ways to interact with key resources (e.g. an optional blog to reflect on the whole course, or a formative assessment that enables room for an individual specialisation) then consider carefully how all of your selected media function collectively. Be realistic; do not be afraid to go back to the drawing board if the cumulative results are not what you would wish for as a course designer.

CONCLUSIONS

The design of the course as a whole is more important than the choice of specific tools or media. The choice of media needs to reflect the learning objectives of the course/module, not dictate the objectives. After the learning outcomes have been established, start with the learning activities and tailor the choice of distributed media to your course team's agreed purposes. The modes of interaction between the learners, and between the teacher and the learners should influence but not dictate the selection of distributed media.

Although a range of distributed media encourages the adoption of a range of learning strategies, more diversified and personalised learning models are more time-consuming for the tutor to construct and maintain. They do, however, firmly shift the emphasis towards student-centred learning, and should encourage learner interactivity and higher levels of active participation in the learning processes.

Good course design needs to 'open out' learning opportunities with the incorporation of new technology, not create additional constraints for learners and tutors, so the symbiotic relationship between the different components in the learning ecology needs to be carefully consider.

4

THE TOOLS IN PRACTICE

In this chapter we look in detail at a wide range of web 2.0 tools, considering their advantages and disadvantages and describing an actual education application.

The following is a list of the tools discussed:

- blogs
- wikis
- podcasts
- e-portfolios
- social networking
- social bookmarking
- photo sharing
- Second Life
- online forums
- video messaging
- e-books
- instant messaging
- Skype
- games
- mashups
- mobile learning
- RSS feeds
- YouTube
- audiographics

RESOURCE: BLOGS (WEBLOGS)

A blog is a type of web page that is simple to create and disseminate and that is used as a form of online journal by millions of users. Some blogs take the form of regular diary entries that are posted in reverse chronological order (newest at the top) and deal with the enthusiasms of the user (the blogger) who will combine personal opinions with links to other related websites, blogs, and other online articles. The ability for other users to leave comments on blog messages means that themed discussions can be built up very quickly and supporting information (other web articles, images etc.) can be shared with people who have similar interests. There are a variety of different services available on the web that enable one to set up a blog, and although some use hosted software (located at another location on the Internet) while others require you to install the software on your own computer, they are all basically very similar. Due to their simplicity of use and their flexibility, blogs have become a fast-growing feature of educational establishments, corporate businesses, and the public sector (e.g. news media sources such as the online *Guardian* or *New York Times*).

The Educational Challenge

Blogging offers opportunities to extend discussion beyond the classroom, or can add value to the online community in blended and distance learning courses. The immediacy of blogging encourages a very fresh approach to sharing information. While some blog spots can simply be a rant on a personal soap-box issue, most are genuinely interactive sites where like-minded users can share information and ideas. The many-to-many mode provides a learning framework that allows bloggers to acquire information very quickly, and to report on what they have learned. This can be easily used by tutors to both extend the subject matter and reinforce key learning points. As with other digital media available over the Internet, the challenge is to somehow separate the useful information in the background noise of tens of thousands of self-publicising blog sites. In order to try to minimise unhelpful blog messages (or just plain vandalism) some institutions have established blog sites that are open only to registered members (students and staff) of that institution, but this may be argued as being counterproductive in seeking to engage with the global learning community while still not being able to ensure the quality of the posted messages.

Strengths of the Resource

As personal, even reflective online journals, blogs can encourage the skills of writing and self-expression. New resources and ideas can be

easily added to the discussion for sharing and further feedback, so blogs make it easy to access new resources very quickly. A general strength is the ability to make connections with experts and opinions outside the classroom/institutional circle, and though this requires a level of trust and openness, supporting evidence can be included to contribute to the construction of a themed archive of information. This leads to the ability to categorise learning and relate it to the experience of the individual, encouraging the learner to contextualise and personalise the learning activities in ways that strengthen learning and build confidence. The ability to request automatic feedback information when a user links to their blog (trackback) allows blog authors to keep a record of who is accessing or referring to their blogs, and to receive some acknowledgement of the value of their blog site. Potential benefits are that blogs can be used to promote critical and analytical thinking on chosen topics, and that the combination of individual working and social interaction can induce critical self-reflection in a rich learning environment.

Potential Disadvantages

Although extensively used in education, there are mixed views about the added-value effectiveness of the medium to enhance learning over other forms of electronic communication. Most blog spaces are public, even when contained within the firewall of a single institution and this may discourage less confident students from contributing to the blog, much less using it to ‘think aloud’ and expose their thoughts to scrutiny. While a strength of the blog is its immediacy, this also means that any lack of attention in maintaining a regular flow of messages may lead to the abandonment of the blog by readers, and therefore by contributors. Detractors of blogs and other online forums maintain that being unseen makes it easier for students to become lurkers that are not engaging with the learning community; but careful attention to the teacher moderation of the discussion can alleviate this to a large extent. Similarly, although the lack of technical confidence in using new software can be addressed through careful induction training for new students, as can concerns about the development of writing skills, there needs to be a strong motivation on the part of users to want to communicate and exchange ideas. This requires thoughtful course design.

Key Points for Effective Practice

1. Start your own blog related to your own course or subject area. Start small, but without regular entries, your readers will quickly tire and move somewhere else if you allow too much time to elapse before the next entry.

2. Give your students a list of some active blog sites and get them to look at other blogs before they start to post their own comments so that they get a feel for the medium.
3. Ask students to start a blog about a subject of particular interest to the individual student, and relevant to the course. It may be more efficient to provide students with their own blog site and ask them to maintain it.
4. Setting formative or graded assessments that require students to read (and comment upon) each others' blog sites and summarise the issues can be a good way to focus the learners' attention on the essentials.

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Institution: University of East London: Masters Degree in Learning and Teaching in Higher Education— Applications of Learning Technologies

How It Works in Practice The module is an entirely online masters level course which can also be taken as a free-standing professional development course for associate membership of the UK's Higher Educational Academy. Participants are required to maintain individual blogs to record their learning experience and the actions they will take

in their own work context. The blog is also used for informal feedback and allows the course designers to adapt the course over time to the needs of the participants. The objective in using blogs on the course is to encourage students to reflect on their professional practice.

A set of guidelines is provided about what should be recorded in the blogs; for example,

- Your impressions of online learning to date
- Your most and least valued learning on the course
- Skills you need to learn or knowledge you need to acquire

Students are also advised as to the ideal length of entries (500 words), time to allocate (1–2 hours), and the need for clarity in writing.

Lessons Learned The blogs provided very useful feedback on the course; for example, regarding technical problems students experienced with the VLE used on the course, the need for a summary of activities at the beginning of each section and the lack of advice on how to avoid losing blog entries.

Students' experience of using a blog proved to be as valuable as the course designers anticipated, and sample blogs have demonstrated an increasing depth of awareness, real ownership of the process, and communal sharing of ideas about applying blogs in various teaching and learning contexts.

URL: www.uel.ac.uk/sdel/staff_development/accredited_courses.htm

RESOURCE: WIKI

Wikis are collaborative, web-based sites for sharing text and other resources. The significant feature of wikis is their open editing function that allows users to jointly create the resource. The information on a wiki can be edited by any and all users but can be controlled by allowing/denying password access. Superficially a wiki may appear not dissimilar to any other web page, but the ease with which the wiki web pages can be edited means that the application is very much more versatile than a conventional static web page. The medium deliberately encourages participation in the joint creation of content, and this may take place either by revising existing text or by adding links to other web pages (within the wiki or to external websites) to extend the information provided. Through the participation of many authors constantly adding and revising information, the wiki can be effectively self-policed to reduce misinformation through inaccuracy or malicious intent. The

rapid growth of Wikipedia, the free, online, multi-lingual encyclopaedia, has helped to popularise wikis as an effective tool for generating and sharing large amounts of complex knowledge. The wiki has given real substance to the shift of the web towards web 2.0—that is towards an online environment in which users are encouraged to contribute and interact with other users rather than be the passive recipients of static information. Another web 2.0 characteristic of wikis is that they encourage a different attitude to information: whereas print suggests that information is fixed and authoritative; wikis create an environment in which information is seen to be fluid and flexible, and even more importantly, communally constructed and owned.

The Educational Challenge

Wikis allow asynchronous peer-to-peer interaction, and with the convergence of digital media a wiki can include images and sound, as well as text. There are several crucial aspects of wikis that would seem to make them ideal for use in an educational environment. First of all, wikis are subject driven rather than time driven and can be adopted as repositories of information on specialist areas of interest, such as an academic course, a research group, or a corporate organisation with participating workers scattered across the globe. The fundamental premise of wiki construction is a belief in the shared construction of knowledge, and this is consistent with a constructivist pedagogy and a focus on encouraging learner-centred content rather than teacher-generated content that students are expected to read and digest. Wikis are very flexible in being able to adapt how information is organised, so that new pages can be added, the layout changed, and sections deleted by interacting to reach a common consensus. Most wikis will allow users to compare the current version of the text with previous versions in order to refine the text, and also will enable each amendment/addition to be traced to individual users. This facilitates wikis being used to build collaborative projects while enabling the contribution of individual students to be credited.

Because of their potential for dispersing disinformation, wikis offer an ideal opportunity for educators to help students gain the skills to differentiate and make their own judgements regarding the accuracy of information.

Strengths of the Resource

Wikis enable the users to generate web pages easily and to alter/amend the text in collaboration with peers in order to create a mutually agreed version that is commonly accessible. Information is not fixed (as in

print) but flexible and changeable to meet the needs of the community of users. Wikis can be closed (only an agreed group of users can change the text) or open (allowing any registered password-holder to change text). Generally a wiki requires very little technical skill or training in order to use it effectively, allowing the users to concentrate on the contents and the context rather than being distracted by the technology. The resource encourages users to work in groups, to develop peer-to-peer generation of information, and to contextualise knowledge by linking text to other relevant resources. The ease and accessibility of the resource encourages wikis to be utilised for building common agendas, problem-solving, brainstorming and creating complex reference lists of hyperlinked information. The medium is ideal for creating group cohesiveness and commonly agreed definitions or information sources among online communities. Wikis allow the structured organisation of resources, as well as asynchronous editing and participation by geographically distributed users, and can link with other digital resources including image repositories and e-portfolios.

Potential Disadvantages

Some critics have argued that the ease of access to wiki editing, and the unmonitored open environment may lead to a very low level of content and no contextual relevance. There has been an extended debate relating to the accuracy of wiki contents, but educators have argued the importance of using the opportunities of this medium to educate learners to make their own judgements regarding the accuracy of information. The potential complexity of a site that has many authors requires care in the construction of the navigation to ensure that users are able to locate and extend the information in a systematic manner and without repetition.

Key Points for Effective Practice

Although wikis lend themselves to collaborative writing by groups of users, this requires a clear focus and an element of self-discipline. This has several points of advantage over traditional forms of writing, including the ability to trace comments and feedback from other users, and simple linking with other digital sources of knowledge. As with other forms of educational resource, a little bit of pre-planning and some clear guidelines on its use, can really help students to make the best use of the resource. The flexibility of the wiki can allow users to create some very effective, dynamic knowledge bases and to share these widely for further comment, and these can range from the trivial (a shopping list or 'to-do' list) to the very complex (a personal e-portfolio)

or the activities of an inter-disciplinary research group. One particularly valuable use of a wiki is for a group to think about how information is organised, especially in a large or complex area, and to consider how to present it in small, hyperlinked chunks.

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Institution: UHI Millennium Institute, Scotland: Greenspace Research Initiative

How It Works in Practice Greenspace Research is an initiative established to investigate ways to improve the planning and construction of low carbon buildings. From the start, the team has used a wiki to share information between researchers and to make this information available to the wider community of interest, including funders, architects, and renewable energy experts. As the project has grown and other partners have been attracted to join the work, the wiki has been extended to provide links to the new activities. The nature of the work and the interdisciplinarity means that researchers do not need to be colocated or sharing information in real time, but allows a repository of information and links to be built up as different areas of the project progress at different speeds. Researchers (staff and students) are allocated an individual wiki identity and encouraged to develop a particular area of the wiki that is most relevant to their own interests. In common with many other wikis, this site is a combination of some pages of very well developed thinking and other pages that are more like rough notes or early

drafts of information that will be extended and replaced in due course as the wiki evolves.

Lessons Learned

- The uses and potential of wikis are endless, but this flexibility can itself be a problem, so for the best results a wiki should have transparently clear navigation from the outset.
- Having established some simple hierarchy of layout to launch your wiki, it is best to populate it with a few simple examples of text, images, links and so on to set the tone and encourage others to contribute.
- Although wikis can be used as a one-way application to express your ideas, they work best when there is open, multiple authorship around a central theme, so be sure to express your initial ideas clearly (e.g. “This wiki is about...”).
- In advertising your central theme, try not to be too specific because this might discourage other contributors from thinking creatively and might restrict their contributions to a relatively narrow area that soon runs out of steam.
- Be prepared to inject enthusiasm by contributing strategically to the wiki as the enthusiasm of others rises and falls over time.
- Be prepared to be flexible, encouraging others to modify what you have written if it is relevant, and also to add pages/sections of their own as the wiki spreads its wings and becomes a wider repository of useful information on the central theme and its various subdivisions of knowledge.

URL: http://wiki.greenspaceresearch.uhi.ac.uk/index.php/Main_Page

RESOURCE: PODCASTING

A podcast is an audio file which can be downloaded and listened to either on an iPod or MP3 player for mobile study or a computer or laptop for location-based study. Video podcasts (sometimes abbreviated to vidcast or vodcast) are also possible, and useful for referring to visual material or for accompanying PowerPoint slides. A blogcast is a blend of two tools: blogging and podcasting. The blog contains associated text and makes the podcast indexable by search engines.

The term *podcasting* is a combination of iPod (Apple Computer’s portable media player) and broadcasting. As with the term *radio*, podcasting can refer to either the content or the process. Anyone with access to

the Internet and the capability of playing audio files on a computer or any portable media device can listen to podcasts.

The Educational Challenge

Podcasting represents an exciting challenge in that it empowers students to create content and take part in authentic learning projects. In other words, students can be active learners, not passive consumers of information. There are uses of podcasting for assessment, as part of e-portfolios and as collaborative projects. For example, students can conduct oral histories and create podcasts which are then used to present their work. Other examples involve students creating reports, historical interpretations, or scientific narratives.

Universities can make podcasts of special lectures, cross-cultural exchanges, guest speeches or other events and make them widely available to students. A number of institutions are using podcasts of all lectures as a way of providing access for certain kinds of disabled students, and incidentally for all students as a method of review or access to missed lectures. For distance or distributed institutions, podcasting offers a way of providing a richer environment than text for remote students.

The ready availability of podcasts on the Internet provides a resource for teachers to add global perspectives to their teaching through adding podcasts to their reading lists.

Strengths of the Resource

- The ability to listen to material multiple times
- Flexibility and portability (when and where to listen)
- Audio resources for blind and distance education students
- Varied opportunities for student generated content
- Relatively low cost, low-barrier tool for both students and teachers
- Ideal for short pre-class listening segments; for example, to address students' preconceptions
- Good use of 'dead time' while travelling or even walking between classes.

Compared with written text, the spoken word can influence both cognition (adding clarity and meaning) and motivation (by conveying directly a sense of the person creating those words). Audio is an extremely powerful medium for conveying feelings, attitudes and atmosphere.

Listening to an iPod or similar device in public is now common practice and hence socially acceptable. These devices have a tremendous consumer appeal that works to their advantage, particularly for younger students who may be impatient with traditional forms of teaching and learning. For distance students, the strength of podcasting lies in the potency of voice communication, which cuts through the dense text of the Internet and offers a human connection. Tutors, professors and librarians have already begun using podcasting for myriad training and learning situations, for example, podcasts of academic journal digests, and vodcasts demonstrating how to use software and operating systems.

Potential Disadvantages

- The shortcomings of audio in general appear to be in the area of providing complex or detailed information that needs to be heavily processed, logically deconstructed, committed to memory, or otherwise requires a great deal of concentration.
- It is less good at conveying detail and facts, in that we do not remember facts and figures from audio as easily as general opinions and arguments.
- Unlike text, audio is hard to browse and hence is a less efficient use of study time than text.
- Copyright is a potential issue if podcasts are available outside institutional firewalls. Searchability is also potentially problematic as numbers of podcasts increase. Likewise, who and where will podcasts be archived?
- In higher education podcasting has been widely identified with recording lectures and then uploading them as podcasts. Unfortunately this single use of podcasting in higher education has seemed to become its identity. This perspective needs to be changed quickly, otherwise podcasting will become just another dissemination medium.
- If a transcript of the podcast is called for—and it usually is, both for deaf students and because students request it for easier access or review—this adds to the workload in preparing a podcast.

Key Points for Effective Practice

1. A podcast must be professional and compelling—not the equivalent of shaky home videos. Nevertheless, good podcasting is about the message, the content, not the technology, which should be transparent.

2. Podcasts are great for conveying passion, personality and a limited amount of content. Use text instead if there is a lot of material to cover.
3. Like all technologies, podcasting should supplement and enhance, not replace. The aim should be to more deeply engage the student with the concepts of the course, not to convey basic course material.
4. Tips for keeping the learners' attention include: alternating speakers, surprising turns in the conversation, changing the pace, relating the topic to learners' experience.
5. Devise relevant, authentic, and fun projects for students to make their own podcasts. Integrate with assessment if possible.

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Institution: University of Leicester: A Pilot Study to Investigate How Best to Integrate Podcasts into Online Learning

How It Works In Practice This pilot study took place within a research project entitled Informal Mobile Podcasting and Learning Adaptation (IMPALA). The aim of the Impala Project is to deliver a testable and transferable pedagogical model of podcasting for student learning in higher education.

The podcasts were designed to supplement the online course material delivered on the online learning environment. The content consisted of updates on the online material, guidance on the weekly activities, and motivational items such as relevant news items and a fun item such as a joke.

Through a questionnaire students indicated the most important contributions the podcasts made to their learning. The most common response was that the podcasts provided a good introduction to the week's work. Students used them to organise and plan their work, and to stay focused on the course. They particularly liked the informal tone.

A useful finding from this study was the relation between podcasts for entertainment and for learning. The latter requires more focused attention and usually being in a static place in order to take notes, at least for the first time of listening.

Lessons Learned This study showed that podcasting helps students at a distance develop positive attitudes towards the teacher and brings informality and fun to formal learning. Nevertheless, it also helps students engage deeply with the learning material. Based on this study, the conclusions are that podcasts should be:

1. integrated into online courses with strong links to other activities and resources, especially if they encourage active learning or collaboration with others;
2. recorded fresh each week and include up to date news and feedback;
3. partly reusable and recyclable by some sections not being dependent on news or feedback from that week;
4. downloadable onto any mobile device offering MP3 playback as well as tethered computers; and
5. follow a radio magazine style rather than a lecture.

URL: www.impala.ac.uk

RESOURCE: E-PORTFOLIOS

E-portfolios are electronic collections of documents and other objects that support individual claims for what has been learned or achieved. In higher education, e-portfolios can be used at course, programme or institutional level. There is still lack of clarity about whether the term *e-portfolio* refers to the software, a particular presentation of the contents or all of the contents.

The Educational Challenge

The primary challenge is in engaging students to maintain their e-portfolios. This is partly because of the tension between institutional control and student ownership of the e-portfolio. When the institution hosts the software and insists on its use either for assessment or accreditation, the student does not take ownership of the process. The challenge here is for course designers to find a way of integrating the use of the e-portfolio into the course and to motivate learners in maintaining them and to support them in understanding the value of reflection. The e-portfolio software is still immature: there are a few proprietary systems but many institutions are developing their own software, sometimes using open source approaches.

Strengths of the Resource

At an individual level e-portfolios could become a portable, lifelong record of achievements, and hence there would be many advantages for individuals in maintaining them. Not only would they contain a certified record of educational qualifications, but they would be a comprehensive resource on which to draw for job interviews and promotions.

At a course level, e-portfolios can provide a strong impetus for students to take ownership of their learning. Given appropriate course design, e-portfolios encourage reflection on learning and hence a deeper approach to learning in which learners relate new material to concepts with which they are already familiar.

At an institutional or programme level, e-portfolios are ideal for encouraging students to set their own goals. The role of the teacher is to monitor students' progress toward the goals and to advise on strategies and resources that would help students meet their goals. The e-portfolio provides the focus for reviewing and discussing student work as well as the record of progress toward the goals.

Through peer and self assessment, e-portfolios can also be used to help students develop generic skills, such as reflective and critical thinking, the ability to evaluate and provide thoughtful responses to different points of view, and the capacity to assess their own work as well as that of their peers.

As a presentation tool, e-portfolios provide the opportunity for students to make a selection of their work for specific purposes, such as a class presentation or job interview. The e-portfolio software allows different levels of access, so for example, users can make some parts available only to themselves, other parts accessible by their teacher and still others can be open to their classmates or the Internet generally.

E-portfolios can also be used for group work and there is no impediment technically to a group e-portfolio. The reflective element of e-portfolios bears some resemblance to blogging and e-portfolios can contain podcasts as evidence of learning. In short, there is convergence amongst many types of social networking.

Potential Disadvantages

The communication element of e-portfolios begins to blur the boundary with a virtual learning environment and hence cause confusion or overlap in trying to establish a central discussion area.

If an institution uses e-portfolios primarily for assessment and accountability, students soon cease to engage with e-portfolios as a lifelong learning tool and view it purely as a course or degree requirement.

Even so, teachers often need to be persistent, skilled and dedicated to develop reflective practices in their students. E-portfolios can all too easily be used as a ‘dumping ground’ for odd bits of multimedia and other course work without the student engaging with the issue of what constitutes evidence of learning.

Because e-portfolio development on a technical level is still immature, there is a major problem with compatibility, as students change institutions, graduate and move to employment. Will e-portfolios be held by the individual or the institution? What happens as systems develop over time? It is hard to imagine that e-portfolios can really be a lifelong learning tool either at a technical or a personal level, given the speed of technical advance. Yet this is how their full potential will eventually be reached.

Key Points for Effective Practice

1. Use formative or iterative assignments with comments from the teacher and peers.
2. Relate reflective activities to the learning outcomes of the course and prompt students to think further about issues and consider other perspectives.
3. Provide examples of reflective writing so that students understand what reflection means in an academic context and build activities around them.
4. Make it fun by giving students the tools to control the look and feel of their e-portfolio (and templates for those without the relevant skills).
5. Integrate the e-portfolio with the users’ online workspace in order to encourage regular updating and seamless moving from course to portfolio.
6. Provide scaffolding, advice and resources on what constitutes evidence of learning.

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Institution: Woodbury University, Los Angeles, California

Woodbury is a college of 1500 students with a main and a satellite campus, using Nuventive iWebfolio software.

How It Works In Practice Woodbury University has adopted the use of e-portfolios primarily as a tool for helping students to succeed in securing employment in a highly-competitive job market. Secondly, e-portfolios are used to assist faculty in assessing and improving the quality of their courses.

The university offers degree tracks in specific high-demand fields such as architecture, interior architecture, animation, fashion design, graphic design, business, information technology and marketing, all of which have a strong visual component. E-portfolios provide a consistent method for presenting skills and accomplishments in a much clearer way than paper portfolios do, and have the added advantage of being available for the employer to look at and study before or after the interview.

Woodbury is carefully creating structured templates and examples of best practices to guide student efforts in evaluating their own progress over four years and in creating the best possible vehicle for demonstrating their true worth to prospective employers.

Lessons Learned

- E-portfolios have helped the institution increase consistency in assessing student work through developing criteria that apply to disciplines and departments.
- Woodbury discovered that they needed to alter the curriculum slightly to make sure the right data were being generated in the classroom that could be used as a basis for assessing effectiveness.
- Faculty members have asked to have the software for their own use in presenting their work, research, interests and educational history.
- Top-down commitment from the institution is vital for embedding the use of e-portfolios for both students and staff.
- The institution needs to provide a sharp focus for the use of e-portfolios; otherwise they are simply an electronic filing cabinet.

URL: http://www.sun.com/products-n-solutions/edu/success/pdf/woodbury_university_success_story.pdf

RESOURCE: SOCIAL NETWORKING SUCH AS MYSPACE AND FACEBOOK

Social networking sites have become incredibly popular with young people almost overnight. They offer an interactive, user-submitted network of friends, personal profiles, blogs, groups, photos, music, and videos internationally. There are many such sites, some more specialised than others and some very much more popular than others. MySpace.com is a popular, general social network that allows members to set up unique personal profiles that can be linked together through networks of friends. MySpace members can view each others' profiles, communicate with old friends and meet new friends on the service, share photos, post journals and comments, and describe their interests. Facebook is another resource, which was originally developed for college and university students, but has since been made available to anyone with an e-mail address. People may then elect to join one or more participating networks, such as a high school, place of employment, or geographic region. At the time of writing, Facebook has just become the number one site for photos, ahead of public sites such as Flickr, and is the sixth most visited site in the United States.

Bulletins are posts that are placed on an online bulletin board for everyone on a user's friends list to see. Bulletins can be useful for notifying an entire, but usually a portion of the friends list (depending on how many friends are added), without resorting to messaging users individually. Some users choose to use bulletins as a service for delivering chain messages about, for example, politics, religion, or anything else. They have also become the primary attack point for phishing. Bulletins are deleted after 10 days. Some systems offer a Groups feature which allows a group of users to share a common page and message board. Groups can be created by anybody, and the moderator of the group can choose new members to join, or to approve or deny requests to join.

Users can browse profiles by age, interests, subjects being studied or names of friends. Then private messages can be exchanged or public notices left on their profile.

In most cases, users are allowed to customise their user profile pages by entering HTML into such areas as "About Me" "I'd Like to Meet" and "Interests". Videos, and flash-based content can be included this way. Users also have the option to add music to their profile pages.

The Educational Challenge

The rationale for using social networking in education is that teachers have a responsibility to give students skills in how to cope with the vir-

tual relationships and to understand what friendship means in the new social culture created by the web 2.0 environment. It is a well-known fact that the social areas of forums used in higher education receive more messages and visits than the educational conferences. Since the introduction of educational forums in the 1990s, educators have begun to realise that social communication is an important aspect of learning.

Another rationale for the use of social networking in education is the opportunity it provides for student creativity, both in self-presentation through profiles, and in artistic presentation through photos and music additions to their profiles. In short, the use of social networking in education is an acknowledgement of the social change this phenomenon has spawned. As with the social forums in educational conferencing, networking sites give students the feeling of belonging and the chance to explore their own identity.

Strengths of the Resource

As with other web 2.0 tools, ease of use explains much of their success. Social networking is an asynchronous tool and has many of the same advantages as educational forums: allows flexible access and keeps a written record of communications. With social networking, virtual connections often lead to real, face-to-face connections.

Many observers claim that these types of networks are ingrained in Internet practice now and are here to stay, though the formats will change. The essence of them is the idea of joining online communities and being able to participate in them.

Potential Disadvantages

The volatility of the youthful user base means that social network sites are unusually vulnerable to the next 'new new' thing. As quickly as users flock to one trendy Internet site, they can just as quickly move on to another, with no advance warning. Already there is evidence of this in the rise of Facebook compared with MySpace.

On a more serious note, there is evidence of teachers and employers viewing the profile of a student or prospective employee, seeing a very different persona, which has had negative consequences.

There are also access issues due to the pages being designed by users with little HTML experience. A very large proportion of pages do not satisfy the criteria for valid HTML or CSS laid down by the World Wide Web Consortium. Poorly formatted code can cause accessibility problems for those using software such as screen readers. They can also freeze up web browsers due to malformed CSS coding, or as a result of

users placing many high bandwidth objects such as videos, graphics, and Flash in their profiles (sometimes multiple videos and soundfiles are automatically played at the same time when a profile loads).

Finally, social networking has become an addictive pastime for many young people as they keep monitoring their site for new activity or comments. Students even do this during lectures and seminars, a practice that has led at least one American university to ban laptops in the classroom.

Key Points for Effective Practice

- Rather than blocking students from using social networking in the classroom, teach them how to discern when, where, and for what purpose technology may be appropriate or inappropriate.
- Offer opportunities for students:
 - to discriminate content on social network sites,
 - not to accept profiles at face value,
 - to realise that in addition to one's peers, others—marketers, university authorities, law enforcement personnel can and do access profiles.
- Provide opportunities for discussion about profiles—how to construct them and what it means to 'present' oneself online.

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Institution: University of Pennsylvania Course: 'The Networked Life'

How It Works In Practice The course called 'The Networked Life' looks at how our world is connected—socially, economically, strategically and technologically—and why it matters. The course designer and teacher uses Facebook to teach concepts of social networking, demonstrating a more effective appropriation of Net Generation lifestyle to foster critical thinking among his students. In this course, which focuses on the social aspects of computer networks, students create their own

Facebook profiles and investigate the connections among their peers, which leads them to deep questions about how social networks tend to coalesce around a small number of privileged members.

Lessons Learned Students are encouraged to bring to the attention of the course teacher articles, demos, web pages, news events, and other materials that are relevant to course topics. Extra credit will be given if the suggested material is used in the course. The course has three mandatory participative experiments in addition to readings, lectures and assignments.

The lead professor runs regular feedback sessions at the end of the course in order to gather experiences from students which could improve the course.

URL: <http://www.cis.upenn.edu/~mkearns/teaching/NetworkedLife/>

RESOURCE: SOCIAL BOOKMARKING

In a social bookmarking system, users store lists of Internet resources that they find useful. These lists are accessible either to the public or to a specific group, and other people with similar interests can view the links by category, tags, or even randomly. Some allow for privacy on a per-bookmark basis. Users categorise their resources by the use of informally assigned, user-defined keywords or tags. Most social bookmarking services allow users to search for bookmarks which are associated with given tags, and rank the resources by the number of users which have bookmarked them. Many social bookmarking services also have implemented algorithms to draw inferences from the tag keywords that are assigned to resources by examining the clustering of particular keywords, and the relation of keywords to one another.

The increasing popularity of social bookmarking and the growth of competitor sites have led to services extending their facilities to offer more than just sharing bookmarks, such as rating, commenting, the ability to import and export, add notes, reviews, e-mail links, automatic notification, feed subscription, web annotation, and creating groups and social networks. Since the classification and ranking of resources is a continuously evolving process, many social bookmarking services allow users to subscribe to web feeds (see RSS) based on tags, or collection of tag terms. This allows subscribers to become aware of new resources for a given topic, as they are noted, tagged, and classified by other users.

Social bookmarking sprang mainly from academic roots and a personal desire to share links and bookmarks with like-minded individuals. Collaborative bookmarking has arisen predominantly from the organisational desire to glean information or knowledge from workers with the hope of storing and retransmitting that knowledge to other workers, particularly at the time that the knowledge or information is needed. Collaborative bookmarking is as much about linking people together as it is about linking people to relevant websites.

Tags are one-word descriptors that you can assign to your bookmarks. They are like keywords but are non-hierarchical. You can assign as many tags to a bookmark as you like and easily rename or delete them later. Tagging can be a lot easier and more flexible than fitting your information into preconceived categories or folders.

Collaborative tagging is regarded as democratic folksonomy metadata generation, i.e. rather than an individual controlling the metadata or tags about an article or other content, metadata is generated by both the creator and consumers of the content. This caters to the long tail of search terminology by deliberately introducing minority keywords and removes the restriction placed on the content of metadata by a controlled vocabulary. Although a collaborative tagging system is more likely to generate meta-noise (i.e. superfluous metadata), this adds to the usefulness of the metadata as it continues to cater to the 'thin end' of the long tail of system users.

The Educational Challenge

There are a number of ways in which social bookmarking can be useful in teaching and learning. Groups can set up a network to share resources they find over a period of working on a joint project. Experts can share their bookmarks with novices. Individual students can share their resources with their peers. Managing the mass of information on the Internet is extremely difficult and social bookmarking is a simple way for sharing the burden.

Social bookmarking is an ideal tool for research as it allows the user to keep track of all source materials and commentaries found online. The researcher can even tag the bookmarks with asterisks to indicate quality or usefulness.

In browsing the web, users finding a podcast they want to mark for later listening, can simply add it to their bookmarks.

Users of del.icio.us, a popular social bookmarking site can save interesting websites and add a bit of commentary to create a lightweight link-log. This can then be added to the user's blog or website.

Strengths of the Resource

Ease of use is again an important feature of social bookmarking, as it is with most of the other web 2.0 tools described in the book. An additional benefit is that the user's bookmarks can be accessed from any machine, whether at home, at work, in a library, or on a friend's computer. There is nothing to download or install.

Bookmarks can be shared publicly, so your friends, co-workers, and other people can view them for reference, amusement, collaboration, or anything else. Similarly, users can find other people who have interesting bookmarks and add their links to their own collection. Additionally, as people bookmark resources that they find useful, resources that are of more use are bookmarked by more users. Thus, such a system will “rank” a resource based on its perceived utility. This is arguably a more useful metric for end users than other systems which rank resources based on the number of external links pointing to it.

Social bookmarking has several advantages over traditional automated resource location and classification software, such as search engine spiders. All tag-based classification of Internet resources (such as websites) is done by the users, who understand the content of the resource, as opposed to software which algorithmically attempts to determine the meaning of a resource. This provides for semantically classified tags, which are hard to find with contemporary search engines.

Potential Disadvantages

There are drawbacks to tag-based systems:

- There is no standard set of keywords (also known as controlled vocabulary).
- There is no standard for the structure of such tags (e.g. singular vs. plural, capitalization, etc.).
- Mistagging takes place due to spelling errors.
- There are tags that can have more than one meaning.
- There are unclear tags due to synonym/antonym confusion.
- Some users provide highly unorthodox and “personalised” tag schemas.
- There is no mechanism for users to indicate hierarchical relationships between tags (e.g. a site might be labelled as both *cheese* and *cheddar*, with no mechanism that might indicate that *cheddar* is a refinement or subclass of *cheese*).

Social bookmarking can also be susceptible to corruption and collusion. Due to its popularity some users have started considering it as a

tool to use along with search engine optimization to make their website visible. The more a web page is submitted and tagged, the more chances it has of being found. Spammers have started bookmarking multiple times the same web page or each page of their website using a lot of popular tags, hence obliging the developers to constantly adjust their security system to overcome abuses.

Key Points for Effective Practice

Use a folksonomy-based tool for research and take advantage of the insights of other users to find information related to the topic you are researching, even in areas that are not obviously connected to the primary topic. Develop activities for students in which they have to consider how information is or should be classified.

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Institution: UK Open University: Technology Course on Robotics

How It Works In Practice The course designer has added a feed from one of his del.icio.us tags, which allows him to get robotics related news items onto the course homepage without having to negotiate any institutional systems. The Robot newsfeed actually uses a del.icio.us link-roll Javascript include to pull in a javascript->html rendering of his last three del.icio.us bookmarks tagged as 'course news'. This means he can now add links to robot related news stories very easily indeed.

Why does he bother? He anticipates that the links will add an element of currency that might contribute to students' experience of the course in several possible ways, such as:

- by providing content that is up-to-date, and might potentially seed forum discussions;
- by adding a bit of color and a wider context to the course material, especially for students who do not participate in forum discussions.

Lessons Learned The course author is aiming to get students to bookmark and tag the links themselves as part of the assessment process and would like to work this into the course learning outcomes, thus

using social bookmarking to help students break away from the model of using private folders to organise information. Social bookmarking creates a true web of resources and connections, one that is not limited to individuals and their folders but represents the interests and judgments of a community of users.

URL: <http://blogs.open.ac.uk/Maths/ajh59/004638.html>

RESOURCE: PHOTO SHARING, FLICKR

Photo sharing is the publishing or transfer of a user's digital photos online, thus enabling the user to share them with others (whether publicly or privately). This functionality is provided through both websites and applications that facilitate the upload and display of images. The term can also be loosely applied to the use of online photo galleries that are set up and managed by individual users, including photoblogs. While photoblogs tend only to display a chronological view of user-selected medium-sized photos, most photo sharing sites provide multiple views (such as thumbnails, and slideshows), the ability to classify photos into albums as well as add annotations (such as captions or tags) and comments. Some photo sharing sites provide complete online organisation tools equivalent to desktop photo-management applications.

Flickr is currently the most popular site for photo sharing and, like other web 2.0 applications, has added features from other tools to make an online community platform. For example, the addition of tags which allow browsing of photos by categories has fuelled its popularity and the service is widely used by bloggers as a photo repository. It also has a lesser-known feature that has many potential uses for teaching and learning: the ability to add annotations to an image. Another feature is the facility for setting up groups which can either be public, public (invite only), or completely private. Every group has a pool for sharing photos and a discussion board for talking.

Flickr provides rapid access to images tagged with the most popular keywords. Because of its support for user-generated tags, Flickr repeatedly has been cited as a prime example of effective use of folksonomy. It was also the first site to implement the use of tag clouds which are a visual depiction of content tags used on a website. The more frequently used tags are depicted in a larger font or otherwise emphasised, while the displayed order is generally alphabetical. Thus finding a tag is possible by either alphabet or by popularity. Selecting a single tag within a tag cloud will generally lead to a collection of items that are associated with that tag.

Flickr also allows users to categorise their photos into sets or groups of photos that fall under the same heading. However, sets are more flexible than the traditional folder-based method of organizing files, as one photo can belong to one set, many sets, or none at all. Flickr's sets represent a form of categorical metadata rather than a physical hierarchy. Sets may be grouped into collections and collections further grouped into higher-order collections. Images can be posted to the user's collection via email attachments, enabling direct uploads from many camera phones and applications with email capabilities.

Privacy can be managed by setting each photo according to one of the following:

- *Privacy level*, which determines who can see the image
- *Usage license*, so copyrights are protected
- *Content type*, flags photos as either photos, artwork/illustrations, or screenshots
- *Safety level*, so other members only see images within their specified comfort zones

The Educational Challenge

Flickr contains imagery that can be used in every aspect of teaching to help develop visual literacy skills, and in the process, help students understand intellectual property rights, while contributing greatly to a host of learning applications. Every subject area can be enlivened by the appropriate use of images.

Flickr clustering allows clustering of ideas so that a particular word can be clustered in numerous ways. This feature can be the focus of a useful educational game whereby students list all the related tags (categories) that they can think of for a particular concept. Then, using the clustering facility, they analyse the different ways the word has been used by people to tag different concepts. This type of inference thinking helps to broaden the students' thinking and helps them to think in terms of connections instead of one isolated term. They have to compare and contrast tags.

Strengths of the Resource

Though there are many ways of using images currently within web-based teaching material, Flickr is a lightweight and simple tool that people can use to quickly add images to their courses.

Flickr has increasingly been adopted by many web users as their primary photo storage site, especially members of the weblog community. In addition, it is popular with Macintosh and Linux users, who are

often locked out of photo-sharing sites because they require the Windows/Internet Explorer setup to work.

Staff members who have a blog prefer to host their personal photos on a site like Flickr rather than on their institutional website.

Potential Disadvantages

Photo sharing is open to the problem of inappropriate and sexual images being easily available. While some people feel that this rules out sites such as Flickr for education, others think that a better approach is to discuss the issue directly with students. It helps them to think critically about something that is going to be a commonplace experience for them on the Internet. Despite the use of filters, students are going to encounter material that adults deem inappropriate. It is the job of educators to teach them how to deal with that. And unfortunately, blocking sites does not teach students what they need to know.

Key Points for Effective Practice

Use the notes facility of Flickr to encourage students to comment on an image, prompted by specific questions from the instructor. The students can then actively engage with the image and think about and discuss specific aspects.

Devise activities for students to create their own image sets and slideshows, and to make presentations to their peers. They can either use their own photos or take advantage of Flickr's tagging system to find images to use as content.

Develop activities in which students have to browse tags and set requirements to analyse how they have been used.

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*Institution: Fashion Institute of Technology,
State University of New York*

How It Works in Practice This is an online course for distance students who use the commenting function in Flickr to add hot-spot annotations

to an image. Once an image has been published on Flickr, users can draw hotspots on the image and then attach a note to those hotspots. Whenever a user moves the cursor over any of the hotspots, the annotations appear. In this case the subject is art history and Flickr allows students to annotate famous paintings by attaching layers of notes and markings directly on the image. If asked to find the symbolism in a 15th century Flemish painting, students can create boxes around the portions of the painting they want to talk about and put comments on the picture. Other students can then mouse over the same picture and see the annotations or pull the mouse back and see the entire painting. The process can make grading and evaluating students a bit more complex, but this is a minor drawback because the visual dimension provides a more interesting, fun and useful way to learn. It breaks down the classroom walls and creates an entirely new collaborative experience for distance students.

Lessons Learned “The problem when you teach online is that you can’t, for example, point to a part of a painting in the way you would in a face-to-face classroom,” one instructor says. “So it occurred to me that I could use Flickr’s annotation function to have students engage more directly with the work of art itself.”

In addition to the use of Flickr, students enrolled in the e-learning courses have access to the other online services: bookstore, library services, online library, technology support, tutoring.

URL: <http://www3.fitnyc.edu/historyofart/bigideas/caa%20article.pdf>

RESOURCE: SECOND LIFE

First opened to the public in 2003 and designed by Linden Lab in California, Second Life is a 3-D multiuser virtual environment. It is a user-defined world, owned by its residents, in which people explore, communicate, and do business. Well over 7 million people around the globe inhabit Second Life. More surprisingly, Second Life supports a fully integrated marketplace in which transactions involving millions of US dollars a month are transacted. The residents create and retain intellectual property rights on their own virtual goods and services.

Given these components, it would not appear to have significant educational potential. However, the ease with which users generate content appears to be a particular draw for Second Life in a range of educational projects, especially business and marketing programmes. Each user creates an avatar and personalises it to represent them in this virtual world. Avatars walk, fly and gesture, and may resemble the user’s

real-world appearance or appear very different. They can communicate by chat, share files and documents, and eventually voice teleconference. This kind of virtual presence helps the development of community especially for distance education. Second Life is not a game. It has no goal, and most resources are not restricted. Characters move through space or breathe water, and they never age or die. Massively multi-user virtual environments such as Second Life are a new type of collaborative workspace.

Adepts are convinced of the future applications of this first example of a mass market virtual reality. In fact, many see Second Life as taking web 2.0 into web 3.0 or even web 3.D!

The Educational Challenge

Second Life provides a unique and flexible environment for educators interested in distance learning, computer-supported cooperative work, simulation, new media studies, and corporate training. Using Second Life as a supplement to traditional classroom environments also provides new opportunities for enriching existing curricula. For distance education, Second Life offers an opportunity to weave in real-time activities.

Besides improving the quality of distance learning, educators are finding that Second Life is a good way to introduce international perspectives. Students from around the world can join in discussions and work on team projects. Unlike online forums, students in Second Life cannot 'lurk'. Their presence is visible to all. The quality of interaction in Second Life is what distinguishes it from online forums and online games—it does not replace face to face communication, but it is more engaging than text-based communication.

Second Life provides an opportunity to use simulation in a safe environment to enhance experiential learning, allowing individuals to practice skills, try new ideas, and learn from their mistakes. The ability to prepare for similar real-world experiences by using Second Life as a simulation has unlimited potential! Many predict that real and virtual worlds will merge, and we will become used to the 'Metaverse' as a part of our everyday life. More and more people will work in virtual worlds. Instead of frustrating hours in traffic jams to reach the workplace, work will take place in a virtual office, perhaps located at the other side of the world.

Strengths of the Resource

The wide availability, global reach, and low barrier to entry are the essential qualities that make it a useful educational tool. It offers

opportunities to use simulation and the immersion experience is very powerful.

Private islands provide the ability to create secure intranet spaces with restricted membership for students and faculty, or islands can open up to be accessible to everyone in Second Life.

Second Life has a Help Island with volunteer mentors to help students navigate, change their avatar's appearance, learn how to build, and so on.

Potential Disadvantages

While Second Life is relatively easy to use, without a solid foundation, students can struggle while trying to acquire the navigational skills necessary to complete assignments. Frustration can lead to disengagement and then it is hard to encourage students to re-engage. The benefit of being entirely user-driven has the disadvantage that it depends entirely on users to make it a learning experience. It is essentially a blank space.

At the moment, Second Life supports only text chat. Many residents interested in serious business and educational applications consider the lack of a native voice chat system a significant disadvantage and use Skype conferences to talk to other avatars.

While Second Life is a great first step in virtual world building, the environment looks cartoonish and there are rendering artefacts due to the need to balance realism with bandwidth and computing resources. Adepts predict that in a few years computer generated virtual worlds for end users will have photorealistic visual quality.

The appropriateness of some Second Life content for students is an issue. As with the web itself, there is a range of seedy activity available to users: gambling, stripping, and virtual prostitution are easy to find if you look for them. Partially because of that, Linden Lab has set up a teen version of the world, known as Teen Second Life.

Key Points for Effective Practice

Use the many available tutorials and Second Life support material (available in the references below) to help students become proficient users. Second Life provides an opportunity to think outside the box, to practice the true constructivist principles, and to empower students to learn rather than be taught.

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***Institution: Ball State University:
Freshman-Level Composition Class***

How It Works in Practice Ball State University used Second Life to teach an English class focussed on writing for academic research in 2006. The course was a hybrid course with at least half of the class time spent online. The teacher applied the fundamentals of rhetoric to the research process, introducing students to methods of research. The many communities of Second Life provided students with rich opportunities for observation, research and interaction with other cultures, as well as many interview subjects for use in their writing.

By creating online versions of themselves, known as avatars, the students have visited ancient cities built in Second Life and have toured foreign communities, learning as they interact with local residents. The program provided transcripts of conversations, allowing students to incorporate these relationships into their research papers.

Lessons Learned In general, a student's ability to adapt to the Second Life environment was more dependent on attitude than technical skills. One major complaint about online courses is that there is no sense of community but Second Life changes that because by using an avatar, students feel as though they are there because they can 'see' and 'talk' to classmates in real time. Second Life was conducive to collaboration in terms of allowing all of the students to work successfully as a group. Second Life became a part of users' lives. They made friends, explored, and shared their work.

URL: <http://www.educause.edu/ir/library/pdf/ELI07216.pdf>

RESOURCE: ONLINE FORUMS

Online forums are also commonly referred to as computer conferences, web forums, message boards, discussion boards, (electronic) discussion groups, discussion forums, bulletin boards.

A forum is essentially a website composed of a number of threads. Each thread entails a discussion or conversation in the form of a series of posts written by the members. These threads remain saved on the forum website for future reading indefinitely or until deletion by a moderator. Most forum software allows more than one forum to be created. Threads in a forum are either flat (posts are listed in chronological order) or threaded (each post is made in reply to a parent post).

A forum administrator typically has the ability to edit, delete, move or otherwise modify any thread on the forum. Administrators also usually have the ability to close the board, change major software items, change the skin, modify the board, ban, delete, or create members. Moderator privileges are often able to be delegated to other forum members, for example, to students. Forums, unlike wikis, do not allow people to edit other's messages. The moderator or administrator is able to remove messages in case they contravene institutional regulations.

Unlike blogs, forums typically allow anyone to start a new discussion (known as a thread), or reply to an existing thread. While many blogs allow other students to post comments in reply, the number of people who can create entries is normally very limited, and the range of viewpoints and beliefs on a blog is also limited. When blogs are used on a course as well as online forums, students may experience a conflict regarding where to post their reflections or comments.

The Educational Challenge

Designing engaging and effective online activities is not easy, and while some generic types have begun to emerge in the literature, they are not always applicable across all disciplines.

Creating a sense of community amongst learners is a delicate matter, and the necessary trust can be undermined by one student posting unpleasant messages. There is no doubt that when a sense of community has developed, students feel that they learn more and benefit more from studying the course.

Online discussions can easily become disjointed with points being made in isolation from others and questions that have been posed never being answered. Perhaps worse, they can often remain superficial. Effective course design and good online moderating can help, but neither can guarantee high quality discussion.

Obtaining equitable participation from all students is the ideal, but it is rarely reached. There are too many extenuating circumstances which account for the fact that most online forums are dominated by a sub-set of the students, though messages may be read by many more.

Strengths of the Resource

1. It is convenient in time and place. Flexibility and convenience for the learner are paramount especially if they have other commitments. Online forums are accessible 24/7.
2. Compared with face-to-face discussion, it is more equable—especially for quieter students. More students participate online possibly because, compared with traditional classroom settings, it minimizes fear and intimidation in front of colleagues.
3. Details of the discussion remain usually throughout the course. One can backtrack and reread a message.
4. The asynchronous nature allows time for a considered response. This leads to a more profound discussion of ideas than is usual in a face-to-face tutorial.
5. Online forums allow the more reflective student the opportunity to participate. In general students are more likely to express opinions and comment on each other's remarks than they would be in a lecture.
6. The lecturer is seen as a moderator, one of the group, rather than a teacher. Nevertheless, for many students, online teachers are more accessible than those in face-to-face lecture courses.
7. Online forums allow for discussion with students from other class groups.
8. The teacher can reply once to a query and all students can benefit. Online forums can also reduce time spent on other administrative course management duties.
9. Online discussion provides an opportunity for students to rehearse information and to formulate their thoughts, which is ideal practice for assessment.

Potential Disadvantages

In many ways, the advantages of online forums are also disadvantages.

1. The asynchronous nature of the medium provides flexibility, but also requires more motivation and self-discipline from students to log on and participate. It is all too easy for busy students to put off interacting online.
2. While the text-only nature of the communication benefits shy students or those who don't normally participate in face-to-face discussions, many others find online forums off-putting because they are unable to read face-to-face nuances such as body language.

3. The support for reflective messages means that there is no immediacy of response. Similarly, it is difficult to get an indication of depth of feeling in an online response.
4. Some students resent the fact that even the non-contributors get to benefit through reading messages.
5. While threading of messages is usually helpful, discussion threads can become confused, allowing discussion to go off-track.
6. The permanency of the record is also a disadvantage in that some students are reluctant to post a message knowing that it will remain throughout the course.
7. Collaborative work becomes very difficult to bring to a conclusion when some students have not contributed. It is difficult to interpret silence!

Key Points for Effective Practice

- Create a collaborative community spirit by requiring shared activities between students and teachers, ensuring constructive criticism, maintaining motivation, and providing assessment tools with timely feedback.
- Technical support services must be made available to train and provide ongoing support for both learners and instructor.
- Provide related links and resource listings to support discussions.
- Quantity of forum postings alone is not an adequate indicator of community development. Forums exhibiting a high volume of communication traffic do not necessarily equate to the establishment of a strong sense of community. Essentially, forums exhibiting a greater percentage of learner interactions (learner-learner and learner-content) demonstrate a stronger sense of community.

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Institution: The Open University: Masters Programme in Online and Distance Education (MAODE)

How It Works in Practice The MAODE is a totally online programme for students all around the world. It has been using online forums since

the mid-1990s and various innovative practices have been tried in order to improve student learning in general and to exploit the possibilities of online forums in particular. About 10 to 15 students are assigned to an online tutor, and each course will have three to seven different tutor groups, depending on the number of students enrolled. Students are given access to all the forums of all the tutor groups, though they are expected to contribute primarily to their own group. This allows students with time and motivation to observe discussions in other groups, but strategic learners or time-poor students know that they need only read and contribute to one forum.

Collaborative and individual activities are at the core of the course design method and tutors are very experienced at encouraging online interactivity. What is also significant for online participation is that both continuous and final assessments are usually built around online activities and students are encouraged to quote from online messages and use ideas from the online discussions in their assignments.

Extensive feedback has been obtained on the programme over the years and much is known about what does and does not work. The students are mostly in full-time employment as teachers or trainers, and are generally more sophisticated as learners themselves than students in other disciplines. The quality of discussion in the online forums is generally very high, though not all students participate equally. There are always champions of the online discussions who post regularly and others who merely lurk or who do the minimum. On the whole, those who contribute more, benefit more from the courses.

Lessons Learned

- Simply providing the opportunity to interact does not guarantee good interaction; most learners need a structure and a task within which to orient their contributions.
- Students using English as a second language may not be as articulate and as willing to take part in online interaction as mother tongue users.
- Grammatical and spelling mistakes are an accepted fact of online interaction, even amongst English speakers, and comprehensibility is the major focus in reduced bandwidths not correctness.
- Integrating some real-time events, using audiographics, Google or text-based chat, is welcomed by many students, especially when organised by students for project work or self-help.
- Archiving messages regularly helps to move students on to the next unit or activity.

- The time taken to participate in online interaction, especially collaborative activities needs to be factored in to the overall student study time (and probably means a reduction in the amount of material to be studied).
- The structure and timetable imposed by collaborative learning makes the course very much less flexible than traditional distance education.
- The schedules of busy professional people who are attracted to this programme mean that holidays, family crises, sudden job commitments etc. are a major hindrance to regular, sustained participation in group activities.
- Ironically, students definitely experience more guilt and stress about failing their colleagues in collaborative work than their tutors in individual work!

URL: <http://iet.open.ac.uk/courses/postgrad/index.cfm>

RESOURCE: VIDEO MESSAGING

There are a range of tools for easy videoconferencing and file sharing amongst a small group of people on the web. Windows Messenger is one example and FlashMeeting, designed by the Knowledge Media Institute at the Open University, is another. One of the benefits of these systems is that they are very easy to use from a pc over the web and do not depend on expensive equipment, support staff or installations. In this sense, they are more equivalent to instant messaging than to videoconferencing.

As with other web 2.0 tools, it is hard to find a term to describe these tools generically. This is partly because they are evolving so quickly and adding the features and functionalities of other tools, and partly because some names of specific tools come to stand for the whole activity; for example, iPods and podcasting. In this case, what we have called video messaging has characteristics of desktop videoconferencing, of whiteboarding, of instant messaging, of Voice over IP (VOIP) and of streaming video. As soon as one tool becomes popular, other very similar ones spring up overnight.

The Educational Challenge

These tools are ideal for small group tutorials and seminars where students are geographically distributed. Of course, they are real-time tools, but in the case of FlashMeeting at least, it is possible to record and play back a session. This is obviously ideal for students who are unable

to join the real-time session. Most of these tools allow only one speaker at a time, thus eliminating any overlaps and confusions. However, the other participants in the group who are not broadcasting may send text messages. FlashMeeting also includes other ways to communicate, such as shared URLs, emoticons, and voting (all things that have little impact on the bandwidth), that can be used while the main broadcast is streaming. The later versions of FlashMeeting also include whiteboard and file upload/download features.

Flashmeeting is already being extensively used by schools in Europe, the United States, and Asia, as it is free to use and offers a secure environment. FlashMeeting is ideal for pupils practicing their language or communications skills and for joint project work in many curriculum areas both on campus and in distributed classrooms.

Strengths of the Resource

Video messaging is a cost effective way of bringing an international partnership to life as it relies on a basic webcam rather than expensive purpose-built video conference equipment. Video interactions are much richer and more complex than text-only ones, particularly in individual desktop contexts where a number of other parallel communication forms and activities can be freely used alongside the audio-visual channel, in support of, or even antagonistic to it. For example, students can ask questions via instant messaging, or use text chat rooms, shared browsing, virtual whiteboards, and so on, whilst others are speaking over the main video channel.

Potential Disadvantages

Some of these tools are blocked by firewalls e.g. Netmeeting, but FlashMeeting has been designed to be firewall-friendly. Broadband is necessary for a video connection, so some students accessing from home will be disadvantaged if they do not have a high speed connection.

Key Points for Effective Practice

Devise peer-to-peer activities that benefit from real time interaction, so that students can experience both receiving and initiating live video.

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*Institution: A Well-Respected Course on Animation
Operated by a Prominent U.S.-Based Company*

How It Works in Practice Over a six-month period a group of international students studying animation attended 99 live, online study group events amounting to around 120 hours of live broadcast meeting time. Some meetings were very large, with up to 34 participants, but the average participation was 10 students. These events were entirely self-organised, policed and managed by the student community. Some students emerged as natural mentors, and the group exhibited substantial supportive, mutually facilitative roles. The use of video meetings on this course was not part of the original design, but was instigated by one of the students. Despite the lack of formal course support for the activity, students operated the events very successfully, providing peer support for each other.

Lessons Learned The contrast between formal and nonformal models of learning is highlighted by this example. With the advent of newer web technologies that enable the Internet learner to seek content and assistance outside a formal program of learning, modes of non-formal work and learning are becoming increasingly interesting.

No external incentives, positive or negative, were provided to the students for the use of this system, and yet over the six-month sample period something like 100 different students spoke online to each other for 120 hours, with 27 of them attending more than 10 different events. They managed this substantial community themselves, taking on appropriate roles within meetings as required and supporting each other's work. Overall, the surprisingly symmetrical patterns in the log data clearly support the users' subjective experience that the events are remarkably peer-to-peer, and shared very evenly within this large community. Even without formal external drivers the students formed and managed a powerful learning model.

It may well be that the subject, animation, is particularly well suited to peer-critique learning, and indeed it does seem that this substantial community has made strikingly good use of it. The students said in interviews, and demonstrated through each event, that live online meetings are extremely powerful in helping them with their work in this non-formal, at-a-distance learning context. The analysis of the log data also clearly illustrates a substantial and longitudinal mutual support and shared use of each other's time and effort.

URL: <http://kmi.open.ac.uk/publications/pdf/kmi-07-01.pdf>

RESOURCE: E-BOOKS

At its simplest, an e-book is an electronic version of a conventional book that can be read on screen using a desktop computer, any portable device (e.g. laptop, PDA) or in some cases a dedicated e-book hardware device. There are many different kinds of e-books, varying in file formats, the diversity of functions, and their ease of use. The changing and often experimental nature of the e-book can be considered to be challenging the conventional idea of a book, as some e-books may contain audio and movie clips, as well as hyperlinks to other sources of information (which may themselves be regularly changed). Almost by definition, e-books are portable, but beyond that they vary widely in the variety of functions that they support. Some e-books simply allow the reader to browse through page after page of electronic text, most are searchable, and some allow users to annotate the text (and in some cases even to change it) or provide links to allow users to exchange electronic messages with each other. The e-book may be an electronic version of a text that is also available on paper, or may be published only in the electronic version (especially for very specialised subjects), but increasingly access to an e-book takes place on the Internet rather than as a separate device. Initiatives such as Project Gutenberg that aim to popularise e-books through extending a repository of digitised books have placed thousands of e-books in the public domain.

The Educational Challenge

This resource allows the rapid circulation (and rapid updating) of texts at comparatively low cost, particularly highly specialised texts and subjects that require to be frequently updated. The incorporation of links to participative tools, such as a discussion forum or an external wiki, permit author-reader interaction, sometimes leading to user generated content that supplements the original e-book. This shared construction of knowledge is an ideal resource in constructivist pedagogy, but some critics fear that it may undermine the authority and reliability of an e-book as a textbook or primary resource. Proponents of e-books claim that this resource can provide highly focused content for distributed learners, and that the egalitarian characteristics of e-books allow less established authors rapid access to a wider readership. This is especially true when considering that many traditional books now have very short print runs and so can go out of print very quickly—the e-book is seen by some as a promising source for materials that are no longer in print or to which access is impeded by the location of the student.

Strengths of the Resource

The resource enables the reader to search the text and to jump quickly between subject sections, for example to check references (which may also be linked by hypertext to online journals). Some e-books allow users to annotate and/or highlight the text, and a few may even allow users to add, or even change, text. The basic text can be supplemented with other digital resources to create a rich learning resource, including images (moving and still), sound files, and detailed links to other online sources of information that can supplement and add value to the original text. The ease of online publishing allows relatively inexpensive production, marketing, and subsequent updating enabling the text to be kept accurate and up-to-date. For some large paper books (e.g. medical reference books) the versatility of the e-book is an attractive alternative that can be searched and cross-referenced more easily and quickly than the conventional book. The ability to enlarge the electronic font, change the colour contrast, and even to utilise text-to-speech software enables the e-book to be more flexible than the conventional book for users with reading difficulties.

Potential Disadvantages

The ease of access may be a problem for some potential users (even the most user-friendly are less portable than a conventional book). In addition, the ability to copy and paste from digital sources has raised concerns about possible opportunities for plagiarism. Although the basic text e-books are straightforward to use, the versions that embed some of the more complex resources may be awkward or clumsy to use, and the overuse of sound or images for their own sake is likely to annoy regular users. As with wikis, the collective or collaborative authorship of e-books challenges many established notions of copyright and ownership of the text. The main limitations, however, are that even with the tens of thousands of e-books available, there is a strong likelihood that the book you are seeking is not available as an e-book, or perhaps not available in a format that the user can easily access due to file format differences. A second major limitation is the requirement, by definition, that the user needs a computer (or similar device) or Internet access to read the material. Despite the availability of text resources onscreen, many users still prefer to print out paper copies for reading and archiving, though this may change if and when the culture of reading directly from the computer screen becomes more firmly embedded in education.

Key Points for Effective Practice

1. There are various ways to utilise software in order to read e-books—students need instruction on effective use of the appropriate software.
2. Using linked documents within a course VLE, or links from a blog to specific e-books (or even relevant chapters) will help to direct students to particularly relevant information in the appropriate course context.
3. Remind students of appropriate keywords and phrases that can be used to search within e-books in order to make reading activities more strategic.
4. When permissible, downloading an e-book to a memory stick helps to make access less location dependant (e.g. the book may be read in a variety of different locations during the day, using different devices).
5. Encourage students to use linked documents to create their own notes and commentary on pieces of reading, with hot-links to the relevant sections of the e-book to support their notes.

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Institution: Belfast Institute of Further and Higher Education

How It Works in Practice There are a number of approaches to utilising the e-book in formal education, these can range from

- Adopting an e-book as a course reader and giving registered students access;
- Adding an e-book to the institutional library and using this in conjunction with a paper version (e.g. to allow access to the resource for off-campus students);
- Hyperlinking other electronic information, such as a tutorial on a VLE, to specific reference sections of an e-book.

The Belfast Institute has chosen to adopt an integrated approach to the use of e-books in their courses, with course teams working closely with library staff to identify, not just relevant e-books, but also specific chapters and sections that are particularly pertinent to the subject being studied. A link is then made from the course material on the VLE to the relevant section of the e-book and included in the recommended reading for that area of study. By encouraging easy direct access to recommended sections of e-books, the institute is attempting to illustrate to students just how easy it is to make use of this resource. The experiment is still in its early stages, but initial results are encouraging and seem to indicate that once learners have overcome their initial trepidation over using e-books (perhaps a fear of being overwhelmed by online information) by this method of directing them to specific pieces of relevant text, the learners appear more ready to return to use other e-books at subsequent stages of their studies. The initial up-front investment in e-books has proved to be well founded and plans are being discussed to extend the e-library provision on a regular basis.

Lessons Learned

- Simply providing an e-book section in the institution library is not enough to promote the widespread, regular use of e-book resources.
- It is never too early to begin discussions between the course team and the library staff about the purchase of centrally held e-books.
- In general, the e-book seems to be an ideal way of making scarce and expensive resources (books) available to greater numbers of students at multiple locations.
- Basing the e-book resource firmly within the library service, rather than within the course team or department, gives added benefits for institutional buy-in and adoption by staff across the institution, but close collaboration with the academics is necessary to identify specifically relevant resources and links.

URL: http://www.belfastinstitute.ac.uk/site_map.asp

RESOURCE: INSTANT MESSAGING

Instant Messaging (IM) is a simple form of synchronous online communication, allowing two (and with some software more) computer users to communicate across a network connection. The primary medium is text, although as with other web 2.0 tools, progressive convergence

has led to some IM networks providing facilities for audio and video. Most instant messaging applications include the ability to set a status message, roughly analogous to the message on a telephone answering machine, which indicates whether the user is available, busy or away from the computer. For these reasons, IM is more akin to telephoning than it is to e-mailing. On the other hand, people are not forced to reply immediately to incoming messages, and in this sense IM is less intrusive than phoning. Predictions are that IM will surpass e-mail as the primary online communications tool.

As thousands of people can be signed into a service at the same time, there are tools provided to organise IM contacts. These systems allow you to add user names to a “Buddy List” or “Friends List,” which can be sorted into several sub-lists. When a user on a list logs on to the IM service, a notification message or sound is played; these notifications can be customised to the subgroup in order to give the user an idea of the importance of the new visitor. In addition, a user has the ability to block or ignore other users; this is an essential tool in dealing with spammers.

The Educational Challenge

The primary use in higher education is as a tool to encourage contact between students and faculty, usually as virtual office hours (although there is mixed evidence as to whether students do or do not prefer IM contact to face-to-face contact with their teacher). In addition, it is valuable for developing reciprocity and cooperation among students at a distance and is often used for collaboration amongst groups—usually to coordinate more sustained online work, to exchange URLs and other snippets of information. As a synchronous tool, it offers the benefit of prompt feedback and the convenience of being available from different locations. There are also administrative uses in recruiting and admissions, and as a mentoring tool or buddy system. Nevertheless, actual practice shows that the primary value is social—especially for remote students and both for student-student and student-tutor contact.

Strengths of the Resource

Given access to a computer, this form of communication is free, easy to use, immediate and widely accepted by users of all ages. It is particularly chosen as a communications medium by shy people and by those with a hearing impairment. For lecturers ‘isolated’ in their offices, it can be a positive communication tool, being more informal and intimate than the lecture hall. It is possible to save a conversation, so as to refer to it later. Also, the fact that instant messages typically are logged in a local

message history provides some of the advantages of e-mails. Multiple conversations can take place between students or between students and the teacher without any of them being interrupted or disturbed.

Potential Disadvantages

The major disadvantage of IM is the security risks: message interception and infiltration of viruses. Hackers' use of instant messaging networks to deliver malicious code has grown consistently.

For instructors, having an instant-messaging program running in the background on the computer means that work can be interrupted at any moment. Instant messaging can disrupt a train of thought, and it is very difficult to delay responding in order to compose a well-conceived answer to a student's question. IM is seen as fuelling the expectation of ubiquitous instructor access. The time commitment, as with other web 2.0 tools, is a significant consideration.

In short, IM is viewed by many as a time-waster which encourages gossip, poor use of English and other negative behaviour, such as bullying and dangerous contacts with strangers.

Key Points for Effective Practice

1. Use IM to develop a stronger sense of community, especially in online courses where students are remote. IM chats can be considered the virtual equivalent of the kind of communication that typically takes place in the common spaces of a campus environment.
2. Set up IM to allow communication between members of different classes, allowing a much stronger sense of community to grow between students in the same programme who are not taking the same course.
3. Encourage students to use IM to coordinate their collaborative work.

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***Institution: Syracuse University: Distance Education
Course in the School of Information Studies***

How It Works in Practice This study is based on a survey taken by 30 students of a core class for the Masters of Library Science degree at the Syracuse University School of Information Studies. The course was taught primarily through WebCT in an asynchronous manner, with discussion boards, written short lectures, regular small homework assignments, group work, and a large final paper. Training documents were created and presented to students via WebCT along with lists of the AOL IM user names of students who agreed to participate in the IM project. The instructor also participated in the IM service and was available for online consultation. At the end of the semester, the students were given a survey which looked at all aspects of communication used in the course.

Lessons Learned Students who used IM software reported communicating with more students each week than those who did not use IM. They found it easier to communicate about class material and easier to communicate in a social manner with other students. They also used the WebCT discussion boards and the telephone less often than students not using the IM software. However, there was not a clear difference in the frequency of e-mail use between the two groups.

One of the key findings was that students who used IM were more likely to agree with the statement that they felt a sense of community with classmates. While students who chose to use IM services felt it was easier to form friendships with other students, there was not a difference in how important they felt it was to form friendships and personal networks with other students.

As the WebCT courses are designed to encourage discussion only about a particular course, the IM service provided a place to talk about other issues that concern the students. The most frequent areas of discussion were topics about the Information Science school or Masters of Library Science programme in which the students were enrolled and social communication. Several students commented about using the service to discuss this class and other classes the students had in common in an environment not monitored by the instructor.

“I think it’s actually the wrong technology to help facilitate learning, due to its inherent one-on-one nature,” commented one respondent. Even though it was not used for course discussions, several students felt it was valuable as a social tool; in fact, one student called IM a “very fun waste of time.”

Students felt that it “enhanced bonds” and “bonded us emotionally.” One student appreciated the “social conversations about librarianship” and another felt that it “contributed to a sense of support, community and access.” It also helped one student to “feel less isolated.” Social communication came through as the most important and frequent topic of discussion through IM.

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RESOURCE: SKYPE

Although Internet telephony, or Voice-over IP (VoIP), has existed for some time, Skype is the first to make it a massively popular tool, no doubt because it offers unlimited free calls between online users, wherever they are in the world. Handsets have been manufactured for use with Skype that can be connected into computers. Skype has also developed a mobile offering as well as bundled video support into the software. Once the user has logged in, they can locate other users on the central Skype register and take part in an audio or video call across the Internet.

Skype is a form of peer-to-peer network although these are based on an ethic of participation, collaboration, responsible sharing and the contribution of content for others to enjoy. Skype is somewhat different from the likes of Napster and other sharing networks, as Skype users are sharing conversations and expanding their social networks through both its voice application and instant messenger (IM) function. It is, in some ways, like having e-mail, IM and a high-quality phone connection combined in one programme, which operates over the Internet through peer-to-peer networks.

Skype software is free and installs easily, and then with an Internet connection the calls using the system are free, and calls to others not on the system are just very low cost. Schools and colleges with Skype

installed and a Skype address offered will be readily identified by international students and enjoy competitive advantage in terms of both cost and accessibility.

Skypecasting allows phone conversations with up to 100 people. Skypecasting is a merger of Skype and podcasting, as the new service allows users to share recorded conversations as well as live conversations via Internet telephony. Skypecasting uses VOIP software to record teleconferences with many geographically distributed students taking part and to publish them as podcasts, which allow audio or video content to be syndicated over the Internet.

The Educational Challenge

Educational uses are many and varied:

- One-to-one support for remote graduate students
- Authentic interactions with native speakers for language teaching
- Integrating a multicultural perspective through global interaction
- Useful research tool for telephone interviews or feedback from students
- Possibility of keeping Skype office hours especially for remote students
- Opportunities for inviting guest expert speakers into an online course.

Strengths of the Resource

The most obvious strength of Skype is that calls are free to other Skype users. Furthermore, Skype's sound quality keeps the high and low tones of sound, whereas telephones and other VoIP software/hardware clip out those parts of speech. This makes Skype particularly valuable for language learners.

As with other real-time technologies, Skype communications offer immediacy and opportunities for direct feedback. Skype also allows users to exchange large files e.g. photos. Although hardly a web 2.0 use of the tool, one-to-many audio lectures can be given to remote students. Finally, Skype allows you to expand your list of contacts and indicates when others in your social network are available to chat.

Potential Disadvantages

Skype, like most other network applications, has risks as well as benefits. The primary disadvantage of Skype is network security. The

problem arises in Skype's use of peer-to-peer architecture, the same architecture used in many file-sharing systems. Skype uses it to route free calls between computers, and institutional administrators fear it may be used to illegally trade online movies and music. Another concern is that its end-user license agreement appears to permit legal use of university's networks by people outside the university. This has led many universities to ban Skype on campus networks.

A feature of Skype that may be very welcome to its users is that all communications are encrypted end-to-end between the two communicating clients. However, while it may be desirable to prevent telephone conversations being tapped, the encryption also applies to all other Skype activities such as file transfer and chat. This means that any filtering or protection for the user or their PC that is implemented on the organisation's firewall or network will be unable to inspect files or other content transferred to the Skype client. Skype effectively provides an encrypted tunnel through the firewall that could be used for attacks against the client PC and any other networked devices it can connect to in turn. Users and PCs must therefore be able to protect themselves against inappropriate or malicious content including viruses and other malware, or even attacks against the Skype system itself, without any assistance from other systems.

Although Skype will work over a dial-up connection, broadband is better, and this could disadvantage remote students without a broadband connection.

Key points for Effective Practice

1. Encourage students to use Skype for peer-to-peer contact.
2. Engage a guest expert to add a real-time input to the course.

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Institution: Lews Castle College, UHI Millenium, Scotland

How It Works In Practice The undergraduate degree program in Sustainable Rural Development is a fully online course with tutor support that is delivered to students throughout the UK at locations remote from the main teaching campus on the Isle of Lewis in the Scottish Hebrides. In addition to discussion boards and other asynchronous digitised resources on the VLE the tutors use instant messaging and Skype to offer some element of intimacy and synchronous short discussion sessions with the remote students. Students need to have broadband Internet access and are given guidance in the relatively simple task of downloading the proprietary software, but are thereafter able to make free calls to other users, including tutors and fellow learners. An icon can be set by the tutor to indicate when she or he is available to receive calls, and this icon can be seen on the desktop of the remote student. If they would like to discuss a particular item on the course, a call can be placed to the tutor simply by clicking a button. If the call is accepted both tutor and student can have voice, video live image, and live text chat in any (or all) combinations. Usually the sessions are fairly short (5–10 minutes) similar to a phone call rather than a set ‘lecture’ and are used to raise questions, clarify points, or put across a particular point of view. The chat sessions can be recorded and archived for future reference. The inclusion of video allows the participants to see each other in real time while they are talking and allows facial cues that greatly increase the sense of intimacy over simple telephone conversation. Pre-arranged mini-conference calls of three or four people can be used to have a group discussion on particular points that have a relevance to more than one learner.

Lessons Learned

- Keep the sessions short and focussed; the novelty of the situation sometimes encourages participants to become immersed in the discussion and if this is not properly directed can tend to ramble a bit.
- The tutor should set some time aside for incoming Skype calls and make this time known to the group of learners.
- The tutor should set his or her ‘online status’ icon to indicate availability for calls i.e. available, busy, or away, in order to avoid unwanted distractions by incoming callers.
- Use the Skype sessions to deal with individual problems and questions in order to add value to the other components of the course learning resources. This is especially important when

not all students on the course have access to Skype, so the Skype contact should be regarded as an ‘optional’ extra for students rather than a mainstream method of tutor–student communication. In this case students without Skype can opt for other methods of personal communication—instant messaging, telephone, or other means that suit their needs better.

- If the online chat facility is used, save the conversation at the end and archive as evidence of the activity that can be called upon in future to help reflection, supervision, and other issues.

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RESOURCE: GAMES AND SIMULATIONS

Games and simulations are not new to education. However, information and communication technology have been added to them, giving them a different character. Computer games, for example, can be delivered to desktop computers, TVs, consoles or mobile devices via CD-Rom, DVD, cartridge or they can be online.

Simulation games allow players to control factors from populations to pollutants, transport systems to stock trading, theme park attractions to family relationships and football teams. Games tend to be less real but more fun; simulations usually have greater realism.

Most games have goals, rules and challenges; web 2.0 games have interactivity. For many popular games, the ultimate key to success lies in deciphering the rules, and not manipulating joysticks. Some games offer an immersive environment in which students become involved both intellectually and emotionally.

Computer simulations tend to be more open-ended and allow the players to do whatever they like within the confines of the virtual world. Simulations allow the user to dynamically explore the modelled domain, and within education, the interactive, dynamic and open nature of simulations puts the user in charge and creates a valuable learning experience. The value of ‘sim’ games is the extent to which games technology permits users to experience a simulated version of actual reality or practice.

The Educational Challenge

Interactive games allow students to compete not only against each other, but also against students distant from themselves. This results in opportunities to develop teams competing at a distance.

Good simulation games can exemplify effective learning principles that enable students to manipulate and evaluate rather than reproduce concepts. The game should be more than an exercise for students; it should allow them to share a common experience and use this as a basis for more detailed discussions.

Simulations are appropriate when there are underlying mathematical models, when a system can be simplified to investigate the effects of a few important criteria, and when our understanding of system properties benefits from their being examined dynamically. In management education, for instance, simulations are often built around role playing activities. The people of the organisation may be simulated with artificial agents whose actions are not determined and changes in the organisation result in a variety of consequences.

Strengths of the Resource

Problem-solving: One characteristic of games that supports learning is that they challenge and support players to approach, explore and overcome increasingly complex problems and thereby learn better how to tackle those problems in similar contexts in future. Good games should allow the learner to operate at the outer limits of their capability and to increase their limits with growing competence.

Alternative solutions: A second characteristic is that games offer the capacity for players to try out alternative courses of action in specific contexts and then experience consequences—in other words to understand how manipulating systems causes particular effects. In all simulations there are multiple paths students can take; students often play the simulation several times taking different paths to see how the results differ because there is not one right answer or one winner. The multiple decision paths allow them to enhance and expand their decision constructs.

Practice: Learning by playing games is a process of constant practice and interaction in progressively more challenging tasks through which players gradually come to understand underlying sets and systems of rules. Unlike reading a book, playing a game demands interpretive competence with images, sounds and actions as well as written words. Successfully playing a game depends on the player's ability to recognise the game's multimodal features and therefore to learn its underlying grammar and how it communicates meaning. Players probe the virtual world of the game, form hypotheses about it, re-probe

it with those hypotheses in mind, and then, based on feedback from that virtual world, accept or re-think those hypotheses. This process is similar to the basic procedure of the scientific method.

Different identities: Games may offer the experience of exploring and developing different identities and the tools and practices that support these. Games are more than simply problems or puzzles; they are microworlds, and in such environments students develop a much firmer sense of how specific social processes and practices are interwoven and how different bodies of knowledge relate to each other.

Motivation: Students who use games find that difficult tasks can be engaging, intriguing and amusing when incorporated into a story and a meaningful context. Motivation and a sense of meaningfulness are aspects they appreciate about the games, and these in turn make learning more efficient. Collaborative learning can enhance the learning process as games encourage students to work together and suggest different strategies and solutions as they interact with the games' learning environment.

Multiple modalities: Students who are visual learners tend to like learning through games and generally games reinforce learning through print, sound, and image.

Potential Disadvantages

Achieving a balance between fun, game play and learning is a goal that is very hard to achieve. Many games are simply banal and others are overly complicated. Designing an effective game is a major challenge. Educational institutions usually do not have the resources of commercial game producers, but students will be accustomed to the quality and dynamism of commercial games.

All too often educational games are used as a fun diversion, a supplement to the curriculum, not a deeply-embedded, core learning element.

Commercial games tend to present stereotyped characters, genders and races. Educational games can correct this. However, the game play, interaction and story must support and be subordinate to the learning processes and knowledge objectives. The overall purpose is not to play a game but to learn in an engaging and effective way! Characters, story, and interactions must be relevant to the learning context of the specific subject or it will cause frustration.

Game playing can be addictive, and many commercial games are full of violence and aggressive behaviour. Educational games can

counteract this by being action-oriented—but not action as in violence or speed but as a constant encouragement to do things—to take action. The overall idea of gaming is to engage, to be active, to be someone, to perform some kind of mission, to reach goals, and be rewarded.

Key Points for Effective Practice

1. Games should stretch students' abilities.
2. Games should be rooted in some firm reality or present strong internal consistency and logic.
3. It is of vital importance that the user does not get stuck anywhere in the game—he or she must be able to quit the game, change strategy, use and “cross-use” different resources without becoming trapped in long sequences that are difficult or impossible to interrupt.
4. Structure and navigation must be crystal clear—no hidden features, buttons, or too many surprises! Avoid gadget and gizmo overload. The guiding principle of navigation design is simplicity and relevance—less is more. The learner should not concentrate his or her efforts on “cracking the code” of the game. And relevance and simplicity do not mean that navigation and structure cannot be elegant.

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Institution: Glasgow Graduate School of Law

How It Works in Practice Since 2000, the Law School has been developing a simulation environment of a town, which is part fiction and part historical fact. This is used on a number of different courses: it provides economic, professional and architectural issues. In time, the School wants to generalise the tool for any program that deals with client or patient: engineers, social workers, health workers, surveyors or accountants.

The simulation is based on the principle of transactional learning; that is active, involved learning from, in this case, legal action, not merely learning about legal actions. The work is intensely collaborative and reflective. Currently the School has formed a consortium to develop an open-source transactional learning environment, called SIMPLE.

Lessons Learned Large-scale simulations such as this need to enhance professional learning across a range of professions. It is not obvious how to do this effectively.

Professional educational simulations need to respond to the ‘lived life’ of the profession so that users develop the insights and modes of enquiry of the profession, as well as form the values and ethics in keeping with the profession.

The simulation designers need to develop narratives typical of the professional life they are simulating. Assessment is ideally part of the simulation.

URL: http://www.bileta2007.co.uk/papers/images/stream_1/MahargP_McKellarP.pdf

RESOURCE: MASHUPS

A mashup is essentially the creation of something new from parts of several separate sources in order to produce a single integrated whole. The name derives from the practice of mixing two or more songs. Typically a mashup combines bits from existing websites or applications, but the term is beginning to be used more widely for combinations of information generally. The first mashups tended to involve the integration of information with maps and this remains a useful educational application. However, many people are now experimenting with mashups using Google, eBay, Amazon, Flickr, and Yahoo’s APIs and volunteer programmers are taking it upon themselves to combine and remix the data and services of unrelated, even competing sites. A further development is that services have appeared which allow users to create mashups without needing programming skills, so that for example, photos from Flickr can be laid onto maps showing exactly where the photo was taken.

The phenomenon of mashups reflects the prevailing environment of web 2.0: it is no longer just a collection of pages, as people are seizing far more control of what they do online. Creativity is the key watchword of mashups as users take bits and pieces from a number of websites and stitch them together in clever ways. In this sense, mashups merely reuse

information, but in the process, produce customised, personalised or novel functionality.

The Educational Challenge

As with the other tools discussed in this chapter, the educational use of mashups can be teacher-centric or student-centric. In other words, the teacher can retain control by designing applications that put students in the position of passive receivers, or can empower students to make the tool their own. Designed with care, mashups can be a powerful learning tool, and can further advance education towards massive personalization. Students can use existing mashups to create presentations based on small chunks of learning content composed of Wiki text, multiple choice tests, movies from YouTube, GoogleVideo, Grouper, and Slideshare presentations. The challenge for the teacher is to design subject-specific problems, issues or questions which motivate learners to create unique responses. As the features and functionality of existing sites grow, so too do the opportunities for new combinations of data.

Strengths of the Resource

Many mashups are visual and this is valuable for visual learners. Mapping mashups provide sophisticated yet easy-to-use tools for visualization—tools that clearly show spatial relationships. In many cases, rendering data or concepts in a visual form—as opposed to simple text and numbers—helps users see and understand more thoroughly the material being represented.

As with other web 2.0 tools, mashups can be useful both as tools other people have created and as something for students to create themselves. An example of useful existing mashups are the online mapping services which allow users to navigate most of the globe through a web interface, viewing varying levels of resolution through maps, satellite imagery, or a combination of them. Mapping mashups overlay data on those maps with clickable markers showing specific points of interest. As for student generated mashups, anyone with a browser can access vast stores of information, mash it up, and serve it in new ways—a sort of endless mix and match opportunity.

There are many administrative applications of mashups used by universities: campus orientation maps for students, locations of job opportunities and graduate programmes and maps for administrators showing the location of new student recruits.

Potential Disadvantages

As the concept of mashups becomes common, one of the dangers is that the mix and match aspect takes precedence over the value of the final product. In other words, it becomes a silly game without learning potential. The use of mashups by students, therefore, needs guidance and scaffolding by the teacher.

There are also institutional issues: as these web based services become the medium for learning, there is a need to provide a level of service and reliability over and above that required for a more passive, resource presentation approach to the web. Similarly, whilst such technology is essentially an empowering one for all learners, there are circumstances in which some students may not have access to the web from home, and some strategy for bridging this 'digital divide' should be in place.

These bottom-up efforts present tough challenges for the sites on which the new services are built. Mashups often use the data without asking first, then present it in unintended ways. Not surprisingly, some website operators have objected. Yahoo initially blocked one mashup site from using its traffic data with Google Maps (before relenting!), and Amazon asked a mashup designer to change how it made links to potential rival sites.

Key Points for Effective Practice

1. The use of mashups by students requires the teacher to adopt a 'fluid' attitude to information: that it is always changing, something that can be mixed in different ways to produce a new learning experience. For this reason, mashups represent a very different experience of learning from the traditional textbook, which presents information as static and unchanging.
2. Mashups should be viewed as a new way of presenting and analysing data, a multimedia experience to enhance understanding. For some students, the multimedia aspect of a mashup makes an otherwise abstract concept concrete, helping them see patterns and movements that explain ideas and their significance. In manipulating data and thinking critically about patterns and relationships, students can get a taste of research as well as experience authentic learning.

Selected References

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A sample of Wikipedia, Google, Wordtraker, and Yahoo! mashup <http://www.wordsfinder.com/>

Brown, M. (2007, March/April). Mashing up the once and future CMS. *Educause Review*, 42(2), 8–9. Retrieved from <http://www.educause.edu/apps/er/erm07/erm0725.asp>

Institution: Galson Estate Trust, the Isle of Lewis, Scotland

How It Works in Practice The Galson Estate in NW Lewis has recently been returned to community ownership and has as one of the key objectives in its business plan the promotion of tourism based upon the unique cultural, environmental, and historical assets of the area. A mashup of web 2.0 tools is at the core of the concept of bringing together the heritage assets of the community in order to increase informal learning about the area.

The long-term sustainability of the project is based upon the motivation of local businesses and enthusiastic individuals, under the co-ordination of Galson Estate Trust, to provide ongoing content management and development with minimal further external expertise or funding.

The community's acquisition of ownership of the Galson Estate coincides with the popularisation of a number of social networking tools which are ideal for developing a sense of community, e.g. YouTube, podcasting, Flickr, and Internet broadcasting. In this project, the aim is to 'mashup' these applications for the purpose of presenting the geographical community to visitors and tourists. The project builds on the fact that broadband is now available throughout the area.

The essence of the project is that, with training, the community can generate all of the content on the site and thereby experience informal learning in the process. Some funding has been secured for:

1. The initial setup, customisation, and inter-linking of the new technology applications that provide the platform (the network ecology) to enable the local community to interact with visitors and tourists both past and future.
2. Training of members of the local community (e.g. tourism micro-businesses, local societies involved in heritage and music, school children, and local volunteer enthusiasts) to manipulate and input data relevant to their own subject areas. A number of learning-by-doing workshops have been run.

Lessons Learned The main lesson from this project is that public participation needs time to gestate, and once it becomes established, it has its own momentum. The training opportunities were well attended and

it was evident that the most effective training revolves around the most appropriate and not the most flashy applications.

Partly because of the speed with which mashups are appearing, and partly because of the developing community involvement, it is important to balance a vision of the project aims with a flexibility to respond to new initiatives, new tools and new participants. If a consultant had been hired to develop the website in a few weeks, it would have been a very different experience altogether. Community involvement and generation of content have made this an exciting and educational project.

URL: <http://www.galsontrust.com/>

RESOURCE: MOBILE LEARNING (M-LEARNING)

Mobile learning devices currently consist of cell phones, personal digital assistants (PDAs), MP3 players, portable game devices, handhelds, tablets, and laptops. However, what used to be separate devices are now converging onto one device. For example, Smartphones are integrated communications devices that combine telephony, computing, messaging and multimedia.

Wireless technology on campuses is becoming the norm, so that students are connected in the library, lecture theatre, cafeteria, halls of residence and even outside on the lawn. For students off campus, Bluetooth technology makes it possible to create personal area networks (PANs) among physically proximate devices, connecting headset device to phones, which can in turn connect to a computer, a PDA, and any other nearby Bluetooth-enabled device.

Currently, laptop computers used in higher education settings outnumber desktop and laboratory computers on campus, while notebook computers are ranked as the most important hardware issue on campus today, followed in second place by mobile telephones. In short, there are more wireless networks, services, and devices than ever before.

The Educational Challenge

Innovative uses of PDAs, mobile phones, and handhelds in education tend to be organisational, administrative and supportive, in other words, learning-related, rather than strictly learning applications per se. This is primarily due to the small screen and keyboard. However, there are many advantages to mobility that render these devices useful for education in almost every discipline. Mobile learning is considered the next step in a long tradition of technology-mediated learning which is heading towards ubiquitous, pervasive, personal, and connected learning.

Learning is a deeply personal act that is facilitated when learning experiences are relevant, reliable, and engaging. The promise of mobile devices is that they help the innovative course designer deliver appropriate strategies, tools, and resources for different kinds of learning.

Strengths of the Resource

The primary strength of mobile devices for learning is that so many learners own and use them already. This reduces the need for training and access, and adds to the rationale for integrating them into education.

Mobile learning is a response to pressures for on-demand access of learners in an information-centric world. It also connects formal educational experience (e.g. taking a class, attending a workshop, or participating in a training session) with informal, situated learning experience (e.g. field work, museums, and galleries). It also allows learners to study while travelling, commuting and at a distance from a wired computer. As campus-based students become more mobile in their learning, the divide that used to exist between distance and campus students ceases to exist. Distance learning is no longer second best. Wireless technology is improving in speed and security at the same time that it is dropping in price. There is increasing evidence that laptops encourage students to be more creative in their projects, as they can easily add photos, audio clips and details ‘from the field’.

Potential Disadvantages

Mobile devices have limited storage capacities and batteries have to be charged regularly. Data can be lost if this is not done correctly. Laptops tend to be much less robust than desktops. Bandwidth may degrade with a larger number of users when using wireless networks.

There are disadvantages for teachers especially with the concept of being ‘always on’, and hence always available.

Questions have arisen about wireless devices enabling cheating on examinations, which has led to many institutions banning them in examination halls.

More challenging is the issue of whether brevity of expression, due to small screens and keyboards limiting the amount and type of information that can be displayed, lead to superficiality of communication and lack of real engagement with issues.

Finally, will the “filter generation”—learners who multiprocess and multitask using multiple media—learn how to think critically and communicate effectively while using mobile digital tools?

Key Points for Effective Practice

- Match the mobile device to the learning objectives.
- Design activities which are interactive, allowing a two-way flow of information.
- Investigate the hardware, software and bandwidth of the learners before planning and developing the activity.
- Keep pages to 40 kilobytes or less for online resources. The magic number appears to be about 15 seconds for the maximum time users will wait for a page to load.
- Keep fonts simple. San serif fonts like Arial and Helvetica are easier to read on screen. Arial is a very common font that will probably be available on most devices.
- Use moblogs (mobile weblogs) for field work and contexts where students are distributed. Each student can add descriptions from their own location.
- Use PDAs for remote students to contribute data to form a single project.
- Build activities in which students interact with each other, not just with the teacher e.g. sharing and commenting on each others' projects).

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Institution: University of Bristol, Graduate School of Education

How It Works in Practice Microsoft Pocket PCs and Palm OS based devices were given to 14 teacher training students to take on teaching practice. Although the course is supported by resources, discussions

and course documents on a VLE, students on teaching practice had difficulty gaining regular access to it. PDAs were considered to be a possible solution to this problem in order to enable their access to the VLE and Internet, and support their teaching and learning.

The project aimed to investigate the potential of the PDA in particular as:

- an e-book
- a source of dedicated science software
- an interface to the world wide web especially via a course-linked VLE
- a store of previously recorded pupil data
- a communications device for e-mailing peers and tutors.

Lessons Learned There is great potential for the use of hand-held, Internet-enabled devices to support students on teaching practice. Having the Internet available as a portable resource was very welcome; it was the software application that the PGCE students considered to be most helpful to both teaching and learning. It helped them maintain their feeling of being part of a community of learners while away from the university.

During the course of the year the most commonly used applications were the calendar or diary scheduler, the web browser and the e-mail client. The other applications that proved useful were software such as spreadsheets or markbooks for organising pupil data, and the word processor or note recorder to note information for future use.

Having the Internet literally in your hand enabled the PDA to act as a distributed memory system. The wealth of information on the Internet meant that students could answer virtually any question and whilst the GPRS signal was not as fast as a broadband connection the delay was acceptable both to the PGCE students and their pupils. Students also discovered that they could even use a PDA surreptitiously in a lesson or meeting to look up the topic under discussion or to chat with experts without overtly appearing absent minded or particularly unintelligent. Nevertheless, the experiment was only partially successful in the sense that, for these students, the use of the relatively unfamiliar PDAs tailed off as the pressures of the PGCE course increased.

URL: <https://www.bris.ac.uk/education/research/sites/pda>

RESOURCE: RSS FEEDS

Really Simple Syndication (RSS), is a set of web feed formats used to publish frequently updated content such as blog and wiki entries, news headlines or podcasts. The RSS feed contains either a summary of the content from the associated site or the full text. This explains the alternative meaning of RSS—Rich Site Summary. The value of RSS feeds is that they make it possible for people to keep up-to-date with their favourite websites in an automated manner rather than having to check them manually. In this sense, RSS feeds could be called a ‘personal newspaper’.

The popularity of blogs and wikis has led to the increased use of RSS feeds; however, they can be used to deliver a great variety of content and even media types. RSS content is read using either a feed reader or an aggregator. The user subscribes to a feed by entering the feed’s link into the reader or by clicking an RSS icon in a browser that initiates the subscription process. The reader checks the user’s subscribed feeds regularly for new content, downloading any updates that it finds.

In many ways, RSS answers the question of how to filter and organise the vast amount of information on the Web. Internet users tend to settle on preferred sources of information, whether news sites, blogs, wikis, or other online resources that regularly update content. RSS allows users to create a list of those sources in an application that automatically retrieves updates, saving considerable time and effort. RSS feeds can be offered at varying levels of granularity, further enhancing users’ ability to specify exactly what information they want to receive. For example, a college or university might offer one RSS feed for the institution’s main news page, sharing information that concerns the institution broadly, and other feeds focused on the college of arts and sciences, the history department, or research being conducted by a professor of European history. Users can subscribe to feeds independently, tailoring the content they receive to their unique interests and needs. There are even feeds that aggregate other feeds.

Growing numbers of online resources offer RSS functionality. Because applications such as browsers and operating systems increasingly support RSS, the technology has the potential to become the primary vehicle through which users interact with the Internet.

An RSS file will typically display the most recent content of a website, usually 10 items or so, updated whenever a new item is added. An aggregator will check a large number of individual RSS files, returning to a given site once an hour or so. Consequently, when new material

is published to a news site or weblog, it is very quickly picked up and distributed.

Though most readers use RSS by turning to an aggregator website, many others use applications known as *headline readers*. A headline reader performs the same function as an aggregator, but is a stand-alone application that usually resides on the reader's own computer (though some, such as Bloglines, are stand-alone websites). Desktop readers, such as AmphetaDesk, FeedDemon and NewsGator, divide the screen into three panes:

- a list of RSS feeds to which a reader subscribes
- a list of titles from the currently selected feed
- the text of the currently selected item.

The Educational Challenge

Finding suitable news feeds is relatively easy; in many cases websites will advertise that they have available RSS news feeds and will also provide addresses, instructions and examples of their use. In addition there are directories of news feeds to find a suitable feed for a particular subject area.

Students involved in cutting edge research projects can use RSS to monitor news and search engines for specific keywords (like nanotechnology or coldfusion) by creating search feeds. Any time a mention of the keyword phrase occurs in a news piece the item will appear in the search feed. Furthermore, collaborative projects using online tools with a distributed team can use RSS feeds to notify each other of new contributions to the site.

Students writing papers or working on research papers on specific topics can create search feeds, so that each time that topic is mentioned they receive notification in their custom search feed.

Strengths of the Resource

For users of RSS feeds the most commonly expressed benefit is convenience. RSS headline readers automatically flag new items, so users need not search through a number of websites looking for new content. Additionally, content is displayed first as a summary description, allowing users to browse quickly through numerous items. RSS readers also provide users with more choice and control because they can determine whether or not to subscribe to a given feed. And unlike e-mail newsletters, which RSS feeds most resemble, the feeds do not contain spam or viruses.

The strength of RSS is its simplicity, flexibility, and utility. Although RSS is not the semantic web originally dreamed of in the laboratory, it is currently the closest example and provides some of the benefits of the original dream.

A particular strength of RSS is that it effectively nullifies spam, which is an increasing problem with e-mail. Furthermore, users can easily opt-in and out of feeds that provide content of interest or importance. Compared with the relative difficulty of unsubscribing from e-mail lists, RSS feeds bring control back into the hands of the end-user.

Potential Disadvantages

To take advantage of RSS feeds, users must locate online sources they trust, which can be a time-consuming task. Even if a site is deemed reliable, it may not offer RSS feeds. Moreover, relying totally on RSS feeds reduces the serendipity that comes from browsing websites and finding unexpected resources.

Not all content is appropriate for RSS, and users need to set up their feeds with care by selecting sites which are frequently updated.

While there are no inherent accessibility problems with the RSS file format, the method by which an RSS feed is displayed does have accessibility implications. A wide range of applications exist that aggregate and display. How accessible they are will be dependent on the application themselves, the operating system on which they run, and, if applicable, the assistive device being used.

Key Points for Effective Practice

1. Use the many how to manuals, such as the one listed in the Selected References, to get started.
2. Search for sites useful to your subject matter.
3. If you have 20 to 30 students posting their work to a wiki, blog, flickr or other site, instead of checking all 30 sites, you can subscribe to their RSS feeds using an aggregator and view it all from the one place.
4. Encourage students to set up their own feeds, particularly when working on collaborative projects.

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***Institution: Athabasca University, Canada:
Combining RSS with Blogging Software***

How It Works in Practice In 2001, Athabasca University's Centre for Distance Education made RSS conversions of all of its online materials that require occasional updating. Twenty courses, involving syllabi, assignment pages, and faculty bios, were installed at a private account on Blogger.com, using a common template developed for the Centre's website. Each page was made accessible to the faculty member responsible for its upkeep. Instead of having to send updated information to a programmer, the faculty member sends it directly to the web, without needing to touch any of its page code. The Centre set up a virtual server to receive these updates, in order to avoid compromising the file transfer passwords of the University's secure server.

Lessons Learned The result was an immediate increase in departmental speed and job satisfaction. For the webmaster responsible for maintaining the online course sites, the update process for each teaching semester was reduced from two weeks to a single day. For the individual faculty members, the amount of time spent on the updates was the same, though they now had ownership of them, rather than having to refer hack editing work to the media team. For the editing and programming mediators, the result has been an easing of their workload, and the ability to concentrate on developing new course design methods.

URL: http://technologysource.org/article/blogging_as_a_course_management_tool/

RESOURCE: VIDEO CLIPS AND YOUTUBE

The YouTube generation is a term that has been coined for the group of Internet users who are making use of today's technology of video sharing with the ease of personal video uploading. Vlogs are an offshoot of this group, allowing users to blog their lives and experiences in writing, and accompany the whole package with a video rendition of their travels. Video sharing is exploding into a variety of industries, including mass media advertising and music. YouTube allows the post-

ing of copyrighted works but removes them once the copyright holder objects.

The Educational Challenge

This medium can enrich the learning experience of college students by providing video material to accompany their textbooks, in-class documentaries and course lectures. However, it is more in tune with web 2.0 approaches to devise activities in which students create the content. The web's shift from a tool of reference to one of collaboration presents teachers with some rich opportunities for e-learning.

Strengths of the Resource

Unlike more static and limited media, like PowerPoint and the decorative course web page, video and audio sharing help professors be more creative and ambitious in the classroom. Video sharing with classmates on the social front is easy, fun, and rising in participation. Education using multimedia and other visual aids has always been a strengthening component of many subjects' curriculum, and today's educators are taking steps to incorporate the Internet and media-based tools to improve participation and learning. Still, video sharing on a small scale could prove to have multiple benefits. Class projects that involve presentations or directions on how to do something could be enhanced with video uploading.

Potential Disadvantages

Infringements of copyright are a potential disadvantage of video sharing, although steps are being taken, for example, by Google, which has bought YouTube, to address the problem. Nevertheless good educational material can be made available, legally, on YouTube and other such services. As with other web 2.0 tools, it is incumbent on teachers to raise the issue of copyright with students and thereby encourage, enhance and empower critical thought.

Another unfortunate aspect of YouTube popularity is the misuse made of it by students videoing lectures without permission and uploading clips of their instructor doing less than appropriate things in the classroom.

Key Points for Effective Practice

YouTube is not necessary for good teaching, in the same way that wheeling a VCR into the classroom is not necessary, or bringing in PowerPoint slide shows with images, or audio recordings. YouTube simply makes more resources available to teachers than ever before, and facili-

tates engaging and active learning. Rather than use up valuable time in class watching a film or video clips, such media can be assigned to students as homework in the same way that reading is assigned. However, to make it work, faculty should keep in mind that the best way to deliver this content is through a course blog. YouTube provides some simple code that bloggers can use to stream the videos on a blog, rather than having to watch them within the YouTube interface, which has advertisements and occasional obnoxious comments.

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IERG on YouTube: <http://ierg.net.weblite~dns.com/news-item/ierg-on-youtube>
 YouTube and Cultural Studies: <http://insidehighered.com/views/2006/11/13/conway>

Institution: University of Texas at Arlington: Senior Level Literature Course on Chilean Nobel Laureate Pablo Neruda

How It Works in Practice For this poetry class, YouTube offered several useful media clips e.g. film clips of Neruda's poetry being used in a film, and music videos of Latin American singers using Neruda's lyrics. These clips illustrated both the reach and the enduring quality of Neruda's poetry even in North American culture. In addition, there were student-produced videos about Neruda, which were of poor quality, though arguably one can learn as much from poor quality when highlighted as such.

Lessons Learned A good video clip can truly convey more than 1000 words, especially in the realms of culture and poetry. Using video clips brings the course alive for the instructor as well as for the students.

URL: <http://insidehighered.com/views/2006/11/13/conway>

RESOURCE: AUDIOGRAPHICS OR INTERACTIVE/ ELECTRONIC WHITEBOARDS

The combined use of voice transmission and computer networking has been used in education for at least 15 years. Nevertheless, no one term has emerged to refer to this activity, partly because the technology keeps evolving. An early term was *audiographics*, but this is not widely used; *interactive whiteboard* is a more descriptive term but tends to be used for a large physical display panel that can function as an electronic copy board. Typically, interactive whiteboards are used in lecture or

classroom environments and the technology allows the lecturer to write or draw on the surface, print off the image, save it to computer and then distribute it over a network. By contrast, the term *electronic whiteboard* usually refers to a system which involves networked audio as well as screen sharing, and is more appropriate for distance or distributed learning.

Typical definitions are: real-time data conferencing combined with audio capability, or, audio conferencing on a personal computer. Whatever the name, this form of social software enables two-way communication as well as a shared screen for drawing, viewing photos or graphics, and in some cases, for sharing computer applications.

Audiographics facilitates a high degree of interactivity between students or between students and the instructor at the time the learning is taking place. The exchange of information is two-way. When students have questions about the material, they are able to ask the instructor for clarification and the instructor is able to respond in real time. In short, electronic whiteboards are a synchronous learning environment. There are currently two distinct kinds of applications in distance and distributed education:

1. The students are all together in a study centre sharing one screen and the instructor is remote.
2. All of the users are accessing through a personal computer and each has a screen and audio connection. This has only become possible with recent technology developments whereby both voice and computer can be connected through one phone line.

The Educational Challenge

Like all good teaching practice, the effective use of audiographics is directly proportional to the amount of effort that precedes the event. Therefore, when used as a tutorial, the instructor needs to prepare material in advance and load it onto the system so that it is easily accessible during the live tutorial.

Now that this technology can be integrated with a virtual learning environment and used with one phone line, it can also function as a communication medium amongst a small group of students for self-help or for working on joint projects. This frees its application from formal, planned tutorials to informal, spur-of-the-moment communications.

In large group settings, the main issue is turn-taking: how it is managed and controlled. Teachers can call on individual students to respond, but this can be daunting for some learners by requiring an immediate comment. Most systems also have a chat box which allows

text messages to appear on the shared screen. Some systems have a method of indicating that someone wants a turn to talk.

Strengths of the Resource

The main strength of audiographics is its application to visual and graphical subjects, such as mathematics and technology, and to auditory subjects like language learning. Text-based virtual learning environments are very limiting for these subjects, and audiographics offers a unique medium for students of these subjects studying at a distance.

The combination of audio and shared screen is beneficial in any subject for motivating and engaging remote students. The personal computer 'whiteboard' can help to enhance a student's retention capability as well as attention span by giving the student something to look at while listening. This is a tremendously important advantage of audiographics. It is also a very inexpensive way to reach out to a large group of remote sites. This cost-saving becomes especially apparent when it is necessary to provide updates and modifications to course materials. Audiographics then is one of the more cost-effective instructional delivery methods.

Studies have found electronic whiteboard activities to be highly motivating and learner-centred when integrated innovatively. They offer a powerful facility for enhancing content and supporting collaborative learning.

One major advantage of audiographics over other distance education techniques is that the tutorial can be modified during delivery e.g. elaborating on a point or skipping some sections. As a real-time technology, one of its most powerful features is the capacity to enable students to interact with the lecturer and each other. There are many combinations of tutorial design: for example, a session could begin with audiographics, then move to offline group work and finish with another connection, either by audio-only or by audiographics in which students can present their offline work.

Audiographics makes it easy for teachers to enhance presentation content by easily integrating a wide range of material into a lesson, such as a picture from the Internet, a graph from a spreadsheet, or text from a Microsoft Word file, in addition to student and teacher annotations on these objects.

Many systems have a voting facility which can be used for rapid learner feedback to the presenter.

Notes and resources from the session can be stored and made available to students who missed the session.

Potential Disadvantages

Multipoint conferencing becomes increasingly complex with the number of sites involved and participant interaction tends to decrease. It requires some skill on the part of the teacher to remember to include everyone. People new to audiographic conferencing often tend to teach or speak to one location (usually to those students on site).

Higher levels of audiographic interactivity require students to have the confidence as well as skills to use a computer at their 'end'. Students unfamiliar with audiographics need to be eased into increased involvement by gradually increasing their level of input.

There is considerable variation in functionality across available software packages. Useful features to look for include:

- Facility to print out or save the results to the computer.
- Support for remote voting or feedback.
- Facility to store sequences of screens for playback.
- Facility to control computer applications via the screen interface.

Key Points for Effective Practice

1. As with all slides, use large type and few words. Pictures add interest but must be relevant.
2. Combining media. Not all delivery has to be entirely by audiographic conferencing. Very effective presentations can be made by combining printed materials (distributed in advance), audio-only conferencing (for discussion), videotapes, computer based education, audiotapes, and e-mail.
3. Promoting interaction between students at all sites is as important as good graphics.
4. Have a back-up strategy in case of telecommunications failure (e.g. revert to audio-only).

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***Institution: University of Strathclyde: PgDip
in Computer Aided Building Design***

How It Works in Practice An electronic whiteboard on this programme is used to investigate the strengths and weaknesses of the Internet as a design communication medium and also to promote group working, peer learning and the development of students' ICT and organisational skills, while also encouraging cooperative and collaborative working.

The whiteboard was used for real-time sessions both amongst the design team and between the client and the design team, usually by importing and then annotating drawings (Jpegs) created on other CAD software. This ability proved very successful in the exchange of information. The drawing tools supplied with the whiteboard were rather primitive and best used only for marking up drawings created in more sophisticated packages. The students often used the text directly onto the whiteboard to add comments to the drawings rather than opening up additional text boxes which often reduced the size of the available viewable window on the screen.

Having text and drawings visible at the same time seemed essential for the development of the proposals. One criticism of working on the whiteboard was the difficulty in knowing who was in control and the students quickly had to establish a set of procedures for writing, drawing, and taking turns. Most students found it more effective to use chat messages and reserve the whiteboard for drawing.

When using the whiteboard, some groups agreed upon a colour coding system for different team members. Codes were established for ending messages in chat sessions in order not to waste too much time anticipating a longer response. Students were often misunderstood when engaging in their virtual communications. Difficulties were overcome in the strategic wording of communications by using humour and adopting a more informal approach to communication.

Lessons Learned Establish all technologies well in advance to ensure reliability. The latest systems are not necessarily the best—'tried and true' is more reliable.

- Allow for technical hitches and have alternative methods of continuing project work.
- Allow students time to familiarise themselves with the software being used.
- Do not overestimate what can be achieved.
- Prepare students for what to expect with team work and working in virtual environments.

URL: <http://cebe.cf.ac.uk/transactions/pdf/HilaryGrierson.pdf>

5

CONSTRAINTS ON COURSE DESIGN

In this chapter we discuss a wide range of problems that can occur in course design using social networking tools. We have divided the discussion into three sections—issues related: to students, teachers or academics, and educational institutions. Of course this division is rather arbitrary as the three are intimately connected, so these categories are used simply to provide structure to the chapter.

Perhaps the most significant factor, which affects all three parts of the triad, is the degree of un-researched, overblown and unsubstantiated claims currently being made about the effect that these tools will have on education in general and young learners in particular. So much web 2.0 literature focuses on the potential of these tools to:

- Provide anytime, anywhere learning.
- Allow students to become publishers, teachers, creators.
- Give access to vast amounts of content.
- Increase students' opportunities to interact with other students, teachers and experts.
- Extend learning to the traditionally excluded, to the disabled and to the global community.

The list goes on, and most of these 'potentialities' are perfectly accurate. The more relevant issue is whether any are being actualised! There is no guarantee that these tools are wanted or desirable or without other insuperable barriers just because they allow these facilities.

The kind of enthusiasm that web 2.0 has generated is not unique; in fact it is common to most social initiatives, particularly those related to education. The problem is that it creates unreasonable expectations and

an inevitable backlash. Already we see many commentators objecting to the very category web 2.0, downplaying its importance and innovative qualities. Whether it is new, different, merely evolutionary, what the web was originally meant to be, or all of these, the fact is that it is a force to be reckoned with in education. This requires research, experimentation and an open mind but not a gung-ho attitude.

ISSUES FOR STUDENTS

While many commentators have written about the readiness of the young to use web 2.0 tools and the effects this is having on their perceptions of learning (e.g. Oblinger & Oblinger, 2005; Prensky, 2001a, 2001b), there is also evidence that some students do not welcome e-learning, much less the use of web 2.0 tools for education. Although this may well change with time, it will probably take considerably longer than the enthusiasts assume. Kirkwood and Price, for instance, note that online access remains problematic for some students and access from work or public machines is frequently not adequate for the kinds of online activities that web 2.0 tools require. They note:

Access to ICT is rarely ideal and unrestricted: learners often need to share computing and communication facilities with others. Course design should reflect this and not be overdependent upon ICT.

Getting access to and downloading remote resources can be very time-consuming when working via a dial-up network: in certain circumstances such activities will not be sanctioned. (Kirkwood & Price, 2005, p. 271)

These researchers point to another student issue: the blurring of the distinction between full-time and part-time study, such that many of the constraints that used to be unique to part-time, distance students are now faced by those ostensibly engaged in full-time study—namely, combining employment with study (p. 258). This means that lack of time and the need for flexible study patterns are major considerations for course designers.

The degree to which young learners are using web 2.0 tools masks another student issue: the need to provide training for those, possibly a small minority, who are not skilled in the use of a range of software that might be used on formal courses. This creates problems for course design, in that it is necessary to cater to novices as well as provide stimulating and challenging activities for the very experienced users. In terms of the kind of training required, there are further headaches:

novices (whether students or tutors) want personalised, just-in-time training opportunities, not formalised, standardised courses at a time convenient to the providing institution. Despite the fact that commentators have been predicting for nearly 20 years that training will no longer be required as software becomes more intuitive and more widely used, every evaluation study still cites training as a continuing requirement (e.g. Weyers, Adamson & Murie, 2004)

Related to technology training is the need for training in information literacy. Recent research in a Horizon Report notes:

Contrary to the conventional wisdom, the information literacy skills of new students are not improving as the post-1993 Internet boomlet enters college. At the same time, in a sea of user-created content, collaborative work, and instant access to information of varying quality, the skills of critical thinking, research, and evaluation are increasingly required to make sense of the world. (New Media Consortium, 2007, p. 4)

Guinee and Eagleton (2006) have observed students taking notes from online sources and have discovered that they tend to copy large blocks of text rather than paraphrasing for future reference. When they come to use the material, they have lost track of the distinction between their own words and material copied from other sources. Furthermore, they do not assess the quality of the ideas copied, nor do they try to produce a synthesis from the materials they have copied. In short, they have the technical skills to find, cut and paste information, but not the pedagogical literacy skills to make it their own.

Several studies seem to indicate that students want only a moderate amount of new learning tools to be used on formal courses (e.g. Kvavik & Caruso, 2005) and most students are very strategic in their use of these tools. For example, Kear (2004) found that:

Students will participate in a discussion forum if they see sufficient benefits for the time invested—and there are different kinds of benefits for different students. Some students will only take part if the course assessment gives them marks for doing so. Some will take part because they gain information and help from others, which supports their learning. Others value interaction for its own sake, and gain support and motivation from other students in the forum. (p. 162)

Students continue to value face-to-face teaching, though it is unclear whether they simply say this in response to questionnaires, regardless of whether they actually attend, or whether they equate face-to-face

with value for money, or whether they are suspicious of online forms of learning.

Course design must, therefore, address two aspects of the student perspective:

1. The need to keep the student workload very much in mind—there is evidence that overloaded courses lead to surface-level learning, and activities and online interaction are much more time-consuming than is usually acknowledged.
2. The need to plan every aspect of the course for strategic learners—that is, every element must deliver ‘learning value for time spent’.

These are both difficult elements to judge accurately when designing a course because there is a large unpredictable element in online learning. Having the honesty to admit that some element has not worked, as well as the perceptiveness and resources to change it are the best ways of approaching the problem.

Reflection as a Learned Skill

The expanding use of e-portfolios and blogging in higher education has uncovered another shortcoming of many students: the misunderstanding of, or inability to, reflect on their learning. Yet the practice of reflection has become a prominent tool for learning in recent years. One definition of it is the following:

Reflection is a form of mental processing that we use to fulfil a purpose or to achieve some anticipated outcome. It is applied to gain a better understanding of relatively complicated or unstructured ideas and is largely based on the reprocessing of knowledge, understanding and possibly emotions that we already possess. (Moon, 2005)

Successful uses of e-portfolios in higher education inevitably ascribe a key role to reflection in the design of the course. As the definition suggests, structuring the practice of reflection transforms it into a learning experience. For example, the teacher may provide prompts to help students connect their reading with the core issues of the course. The affective dimension of reflection is also an important part of the process and one with which students may well need guidance. They may need encouragement to use the first person in their reflective writing and to acknowledge the significance of feelings in the learning process.

One very effective way of structuring reflective activities is to relate them to the learning objectives of the course. Documents, project plans

and an annotated bibliography might also be organised around the objectives along with the reflective pieces of work. Frequent feedback may be required to prompt students to think further about issues, and to consider other perspectives.

Reflection is not something to be carried out only at the end of an activity or learning experience. Reflection should be a continuous process throughout the study period. At the beginning of a course it is useful for students to reflect on what they don't know, what they would like to learn and how they want to go about it. Students might then work in small groups to identify useful resources to address their knowledge gaps. They might also form larger discussion groups to evaluate the resources they have found. Students might be required to keep a learning journal throughout the course in which they record their thoughts, observations, feelings and questions. It is up to the teacher or tutor to direct students' attention to other resources or to further questions. This process is facilitated by e-portfolio software which allows the student to share parts or the whole of the growing portfolio with named people.

Many students will need help in understanding what reflection means in an academic context. For this reason it is useful to provide examples of reflective writing and to build an activity around them by asking students to evaluate what learning is being gained through the reflective process. One of the barriers to learning through reflection is that students rely on formulaic responses to reflection exercises. This may be prevented by studying examples of authentic reflection and by the teacher referring to the examples if students appear to be floundering.

Reflection is an essential feature of a deep approach to learning. However, it is inappropriate and unnecessary on a course whose aim is to impart a large corpus of information for students to digest and reiterate on the exam at the end.

Reflection seems to be a part of the kinds of learning in which learners try to understand material that they encounter and to relate it to what they already knew. Relating new material to what one knows already may mean reflecting on what one knows and modifying it (deep approach). Reflection does not seem to have a role in the learning in which learners try just to retain new information without creating deep links with the new ideas (surface approach). Reflection will also be involved in the process of representing learning—when, for example, a learner's understanding is tested in a format that demands reprocessing of the ideas (e.g. an essay). It is less or uninvolved in an approach that requires

reiteration of the responses in the same format as the original knowledge. (Moon, 2005)

An example of an activity that helps students to relate new material to what they already know is called a 'critical incident diary', which works very well in e-portfolio software. This involves students describing instances of learning over a period of about a week. Examples might include solving a problem, encountering a new idea, resolving a conflict or enjoying a novel experience. The purpose in writing about these instances is first of all to observe them, second to be able to describe them and finally to consider what was learnt from them: if the learning can be related to course issues, so much the better.

Should reflection be assessed? This is a question which divides practitioners down the middle. Some say that it is not appropriate to "grade people's feelings." Others contend that it will only be valued by students if it does contribute to their final grade. What is obvious is that the teacher needs to think carefully about how to assess the reflective component of the course. Three factors are critical:

- The reflective activities need to be directly related to the learning outcomes of the course.
- They need to be appropriate to the level and content of the course.
- Students need to receive adequate preparation and feedback from the teacher about the reflection process.

If these guidelines are followed, assessing the reflective element of an e-portfolio or blog can contribute to students' intrinsic motivations for learning.

Herrington and Oliver (2002) describe the method they used to encourage reflection on a graduate level online course. This involved a learning journal and a continuous process of reflecting on their work. However, the central feature of the process was their use of an authentic task, chosen by the student, as the focus of the work.

It is entirely up to the student to propose a task that suits their own particular circumstances, with the proviso that their work is informed by current literature, and that they consciously reflect on the process as it is happening. (Herrington & Oliver, 2002, p. 317)

The other significant aspect of the process was that students had access to a variety of online resources and supports; for example, a list of books and relevant texts, links to online journal articles on reflec-

tion, and a website which helped students structure their reflection on the task. The authors note that a complex task requiring decision making and reasoning is required in order that students appreciate the need for reflection.

At an undergraduate level, a number of practitioners recommend dual entry procedures to support students in understanding the nature and value of reflection (Hatton & Smith, 1995). So, for example, in the first column students might describe a learning experience or summarise an issue from the course material; in the second column, they might write a critical reflection on the experience or issue. In this way students learn to distinguish between description and reflection, and are empowered to consider their own thoughts and feelings about their learning.

The aim of developing reflective learners is to encourage students to be more self-aware and self-critical; to be honest about themselves, and open to criticism and feedback. An e-portfolio with structured reflective processes and mentoring by the teacher can instil these qualities in students. Activities which require students to be objective in weighing up evidence or which encourage them to be open to different approaches and prepared to try them, fit well within an e-portfolio framework. Ultimately this method of teaching helps to develop independent life-long learners. Nevertheless, many students are resistant to reflecting on their own learning and it will require course design skill on the part of the teacher to instil it. Many studies report findings that suggest students are task-focused and outcome oriented and that they find it difficult to understand the need for reflection (e.g. Mitchell, 2002).

ISSUES FOR TEACHERS

Ever since the introduction of online learning in the early 1990s, there have been reports about the ways in which technology changes faculty roles because it changes their workload and responsibilities. The change is usually regarded as more work for the same pay and recognition. This perception on the part of teachers has four related elements: workload, promotion, skills and intellectual property rights.

1. Workload

Parker's (2003) analysis of over one hundred articles concludes that it is intrinsic rewards that motivate most teachers to develop innovative, online elements in their courses: personal satisfaction, flexible scheduling and reaching non-traditional students. Using new technologies and developing new ideas also enter the equation. Maguire's (2005)

study shows that if the necessary extrinsic rewards are offered, such as decreased workload, release time, stipends and technology support, then the usual barriers are more easily overcome.

Workload and time requirements are difficult to measure, which perhaps explains contradictory evidence from studies claiming that moving to online teaching takes more time and those which show that it does not. Sammons and Ruth (2007) conclude that:

Time requirements are difficult to measure, as they are dependent on the subject, number of students, instructor skills, type of technologies used in the course, and course quality, but the clear finding is that for most full timers the conversion to online mode is a significant user of previously discretionary time. Regardless of whether the workload actually increases, certainly the pace of work and the working style change. The time spent teaching online may not actually be greater, but the “chunking” or flow of tasks online is different. (Sammons & Ruth, 2007)

Nevertheless, there is some evidence that the amount of interaction with students actually increases. Because of the individualized nature of e-mail communication, interactions are more numerous and personalized than in many traditional courses (American Association of University Professors [AAUP], 2002). For some faculty, the increase in student-teacher interaction may be viewed as a disincentive, for others it acts as an incentive.

Faculty members also complain about changes in the scale of their teaching and this is linked to government and university level policies and pushes to save money. They often report increasing staff workloads, first year transition problems and problems arising from the increasing diversity of students. Although generally critical of pushes for flexible delivery through the use of Internet-based technologies, these new modes of delivery are acknowledged as the most obvious way to deal with the larger student numbers. However, many faculty members continue to express reservations about more flexible modes because, although they are an obvious response to larger student numbers, they are not viewed as solutions to problems caused by these large numbers. They fear that online solutions will diminish community involvement on campus, personal contact, self development and one-to-one contact.

In addition to the increasing number of students, there is an increasing diversity of students. Changes noted in the student population include the more diverse language and educational background of students, the more diverse experience and skills of students and more

diverse student circumstances. The increase in diversity of students' language and educational background was linked to the growing number of international students and to government and university level policies on widening participation (Lynch & Collins, 2001). In theory, web 2.0 tools should help to address the problems created by the increasing diversity of student backgrounds and experiences: choice, personalisation, flexibility and student-centred approaches are all hallmarks of web 2.0 tools. In any case, one-size-fits-all lectures are less and less effective for the changing student population.

2. Promotion

As we noted in chapter 1, the nature of scholarship is changing due to web 2.0 and other technologies. The traditional processes of recognition and promotion act as a barrier to faculty venturing into the web 2.0 environment. The 2007 Horizon Report notes:

Academic review and faculty rewards are increasingly out of sync with new forms of scholarship. The trends toward digital expressions of scholarship and more interdisciplinary and collaborative work continue to move away from the standards of traditional peer-reviewed paper publication. New forms of peer review are emerging, but existing academic practices of specialization and long-honored notions of academic status are persistent barriers to the adoption of new approaches. Given the pace of change, the academy will grow more out of step with how scholarship is actually conducted until constraints imposed by traditional tenure and promotion processes are eased. (New Media Consortium, 2007, p. 4)

An example of this new form of scholarship is given by Weller (2007b) who explains the benefits of blogging and justifies it as an academic activity:

My main aim was to get across the idea that keeping a blog is both an academically valid activity and also really beneficial for the individual.... For me I would say the two strongest points are that it provides a useful means of engaging with technology, a base camp in the online world as it were, and that of all the academic activity I engage in, blogging is the one I probably enjoy the most (apart from having drinks in a bar at a conference in Hawaii, say, which is also quite nice). It is where a lot of the stuff you came into academia for in the first place, but has been eroded by increased administration, workloads and formal metrics (casts disapproving look at RAE), still persists—for example, lively debate, creativity,

new ideas, good humour, collegiality, the progressive development of half-formed concepts through dialogue, etc. (Weller, 2007b)

Related to the issue of promotion is the perception that using these tools will de-professionalise the faculty role. As content is increasingly available online and particularly in open-content sites (e.g. the Open Learn website by the Open University <http://www.open.ac.uk/open-learn/home.php>), some academics see their traditional role as content experts being undermined. Chisholm notes:

Faculty who use commercial course management software become almost invisible...this invisibility contributes to the illusion that the twenty-first century instructor is a generic, easily replaceable part in a larger Automated Education Machine. (Chisholm, 2006)

Instead of seeing web 2.0 tools as an opportunity, they see it as a threat to their traditional ways of working, their well-established view of their curriculum and their notions of teaching and learning. They perceive that their role as teachers will be diminished as the role of technology increases, even though most studies suggest that the role of the teacher will change but not necessarily diminish. While it is true that the nature of the interaction with students becomes computer-mediated, the quality of interaction often improves—moving from question and answer to genuine discussion and debate.

3. *Skills*

Lack of the necessary skills to use web 2.0 and other online tools is a recurring theme in the literature on inhibitors to innovation in education. There are two aspects of this skill shortage: lack of experience with the technology and lack of understanding about how to use it for learning. Many teachers are worried about developing online courses on their own time with few institutional resources. Without assistance from instructional designers or graphic designers, faculty may feel that the task is too daunting (O'Quinn & Corry, 2002). Wilson (2001) found that faculty frequently expressed inhibitions about not possessing the necessary and progressive technological savvy or having the requisite technical support for themselves (Bower, 2001; Pachnowski & Jurczyk, 2003; Rockwell, Schauer, Fritz & Marx, 1999).

Technical skills need to be offered by the institution, although they may best be acquired through personal practice, collegial interaction or one-to-one sessions with friends. The same applies to pedagogical skills, which include:

- **Online community building:** Academics have to learn how to welcome, encourage, support, and control students in an online environment. They also have to encourage intra-class participation (e.g. introducing and connecting students).
- **Designing online activities:** Academics need to be able to design learning activities that can effectively be carried out online.
- **Discussion forum:** There is a wide range of skills to learn to facilitate an effective online discussion. These include discussion activity design and set-up, discussion introduction and close-down, discussion moderation, and assessment of contributions.
- **Information literacy:** Academics have to develop skills to help students find and manage information (McSporran & Young, 2004).

Academics have always seen themselves as content experts not media experts. Online learning is increasingly demanding a different set of skills.

4. *Intellectual Property Rights*

Many faculty members see the move from face-to-face teaching to online learning as a loss of their rights over their teaching material. Open Content initiatives by universities are an obvious example, but even material posted in the institutional VLE may be considered the property of that institution. Chisholm (2006) notes:

Teachers can lose their intellectual property when they upload course materials to course-management programs. In a 2000 article published in the *Atlantic Monthly*, Eyal Press and Jennifer Washburn reveal that many teachers who develop courses on WebCT and similar systems lose the rights to their material after they post it, thereby enabling the vendor or the university to sell the material to an online school or to hire an adjunct to “redeliver” the same material for considerably less money. Many universities have rewritten their faculty handbooks or intellectual property agreements so that the university or the course-management system owns the course material. Their doing so is part of a larger effort to turn faculty work into a currency that retains its value long after a teacher graduates or is laid off. (Chisholm, 2006)

Chisholm argues that faculty who knowingly or unknowingly give up ownership of their course materials contribute to the erosion of intellectual freedom, and that freedom is compromised when individual course material is distributed to others as part of a standardized curriculum initiative. Furthermore, distance education courses are often treated by universities like inventions, with the result that the university treats them more like items for which they own the patent and for which they will return a portion of the royalties to the faculty member. This is in contrast to the traditional classroom where the faculty members have the full rights to publish their materials and all royalties return to the faculty member (Estabrook, 1999).

These perceptions and attitudes are clearly at odds with the social changes happening on the web regarding what is often called, the gift culture, the notions of user-generated content and the evidence from research on socially constructed knowledge.

Knowledge Acquisition through Ongoing Discourse

Knowledge acquisition is not a stand-alone entity but rather is constructed over time through social engagements and ongoing discourses within cultural contexts and value systems. Based on assumptions of social constructivist theory, an individual acquires knowledge only through his or her engaged social activities. When members of a community get together and interpret a world as their shared world, they form a set of beliefs and culture, and, over time, knowledge about their world. In this social negotiation process or zone of proximal development (ZPD), students contribute to and learn from each other's pragmatic knowledge while adjusting to a group consensus on a topic (B. Kim, 2001; Vygotsky, 1978).

Influenced by knowledge acquisition theories, many learning theorists have begun to connect learning theories with brain research. Existing studies on the brain look at the complex and interconnected nature of the brain and how the mind constructs meaning. Brain researchers examine how the brain seeks meaning through different patterns, and why instructions should be designed with the process of reflective inquiry that allows students to connect problems directly to their lives (Gibson & McKay, 1999). Since learning is influenced not only by new information but also by emotion and personal biases, "the need for social interaction...is somewhat like the weather. [It is] ongoing and the emotional impact of any lesson or life experience may continue to reverberate long after the specific event" (Caine & Caine, 1991, p. 82). Accordingly, knowledge acquisition in an online environment has to

embed activities that allow students to frequently reassess their knowledge in response to new developments of predicted or unpredictably new knowledge created through social engagements. In designing an online course, the question is how to design a curriculum that allows students to connect and reflect on literature and personal experiences, and to acquire new knowledge through social engagements and ongoing discourses.

It is generally recognised that technologies are first used by enthusiastic early information technology (IT) adopters, later by mainstream users, and eventually by late adopters (e.g. McGovern, Pannan & van der Kraats, 2001). While some elements of online learning have been mainstreamed, web 2.0 uses are still in the early adopter phase. Long-standing tensions regarding online learning have still not been resolved and remain barriers certainly for the late adopters, if not even for those who follow immediately behind the early adopters.

ISSUES FOR INSTITUTIONS

Marginson and Considine (2000) outline a significant change in the governance of educational institutions over the last few years. Although they write about the Australian context, their comments are widely applicable:

Universities are no longer governed by legislation: they are more commonly ruled by formulae, incentives, targets and plans. These mechanisms are more amenable to executive-led re-engineering than are the deliberations of a council or an academic board, and less accessible to counter-strategies of resistance. They also fit with management-controlled tools such as soft money budgets, commercial companies, temporary institutes for research or teaching, fund-raising and marketing campaigns, all drawn together in a complex web of accountability tied only to the senior executive office. (Marginson & Considine, 2000, p. 10)

These changes mean that the culture of institutions has to reflect the new imperatives, and there is considerable resistance to this cultural change. Some have referred to it as the commoditization of knowledge and the 'student as customer' approach to learning. What web 2.0 approaches have led to, according to some, is the 'cult of the amateur'. Keen (2007) has written a book with this title in which, apart from a number of rants and provocative statements, he points out the downside of mass amateurization:

- The lines between fact and opinion, informed expertise and amateurish speculation are wilfully blurred,
- History has proven that the crowd is not often very wise, and he cites slavery, infanticide, the Iraq war and the disastrous Tulip-mania that swept the Netherlands in the 17th century.
- Because web 2.0 celebrates the “noble amateur” over the expert, and because many search engines and websites tout popularity rather than reliability, it is easy for misinformation and rumours to proliferate in cyberspace.
- The democratized web’s penchant for mashups, remixes and cut-and-paste jobs threatens not just copyright laws but also the very ideas of authorship and intellectual property.
- Blogs and wikis are decimating the publishing, music and news-gathering industries that created the original content those websites ‘aggregate’.

Many other commentators agree about the spread of amateurisation, though not all are so caustic. Coates, for example, pinpoints weblogs as the leading tool in the process:

Weblogs are becoming the bridge between the individual and the community in cyberspace—a place where one can self-publicise and self-describe but also learn, debate and engage in community. In other words, weblogs are not only a representative sample of mass amateurisation, they’re becoming enmeshed in the very structures of information-retrieval, community interaction and media distribution themselves. Weblogs are now facilitators of mass amateurisation. (Coates, 2003)

Poore (2006) takes a more measured approach and one more geared to the educational implications of amateurization for the course designer:

Web 2.0, and the changes to thinking about education it signifies, is a frightening prospect for many. There is, of course, the fear of being technologically left behind. And then there is the fear that many students ‘won’t know anything anymore’. But the latter, at least, is not quite true...students will just need to know different things. And if those ‘things’ are the higher-order skills of analysis, critique and evaluation, then that is surely a good thing, and new ways of learning need to be embraced. It’s our job as teachers to make sure, however, that students don’t simply become overwhelmed by what’s out there in cyberspace, and that we focus

instead on using our own critical skills to lead them safely through Web 2.0. (Poore, 2006)

Downes (2007) has an even more optimistic view:

It may be that the resulting socialisation of teaching and learning, if it occurs, will go hand in hand with less prescriptive, target-driven and centralised policy. Looking back five years from now, I suspect the apotheosis of mechanistic, e-learning 'content delivery' systems will coincide with the peak of target-driven, test-based education policy, and what follows will be more personal and aimed towards a broader set of personal development goals in both technology and pedagogy. The personalisation agenda is not only about interface options and learning styles, but the whole experience of how, what and with whom we learn. (Downes, 2007, pp. 9–10)

No doubt there are many who are more pessimistic about the possible demise of policy-driven education.

Another aspect of this amateurisation of education is the view of some academics that course design using web 2.0 tools is simply a form of pandering to students and 'dumbing down' the content of courses. Many critics of current student attitudes have pointed to students' inability to make their educational activities a true priority (Crone & MacKay, 2007); their need for someone else to provide structure, direction, and praise; and their inability or unwillingness to engage deeply with concepts and ideas. A particularly strident attack comes from Gorman (2007) who says:

There is a present danger that we are 'educating' a generation of intellectual sluggards incapable of moving beyond the Internet and of interacting with, and learning from, the myriad of texts created by human minds over the millennia and perhaps found only in those distant archives and dusty file cabinets full of treasures unknown. What a dreary, flat, uninteresting world we will create if we succumb to that danger! (Gorman, 2007)

The opposite argument to the pandering claim is that if education providers fail to engage with the way students interact and exchange ideas, they risk becoming irrelevant. Between these two extremes lies the route of engaging with their tools and discourse while at the same time directing them to an educational outcome.

For educational institutions, these issues raise a number of concerns around policies and practices in the following areas:

- Learning managements systems or virtual learning environments (VLEs)
- Staff development
- Assessment processes.

Virtual Learning Environments

Regarding institutional VLEs, Attwell (2007) points out:

The major implementations of educational technology have been not to encourage such networking and creativity but to manage learning and to isolate networks. Learning Management Systems are WSYWYG—they do what they say, manage learning. Systems have been developed as a ‘walled garden’, to perpetuate the isolation of the school from the wider outside community.

We tend to recreate with new technologies older social forms of organisation. Thus we talk of the virtual classroom or the virtual university, attempting to recreate and preserve the old paradigm of education with new technical forms. Even in Second Life, a multi player 3D virtual world, universities have been investing heavily in buying islands to recreate in 3D form their building and classrooms. (Attwell, 2007)

In short, he implies that institutions are not grasping the implications of web 2.0 changes. Attwell’s reference to the ‘walled garden’ raises a particularly contentious and complicated issue for universities and other educational institutions: in order to control activities, aggregate blogs and in some cases, provide protection from predators, many institutions have chosen to keep all educational material and interaction behind a firewall. Of course this practice negates some of the main benefits of social networking: the opportunity to extend and develop interactions with people outside the limited group of peers on one’s course. Anderson (2007), commenting on blogs in particular, says:

Motivation is arguably the most important task of the teacher. Those that really want to learn usually do. Closed blogs tell students that they are engaged in ‘school’ work that by definition is removed from their real world of family, personal interest and employment. Many find it much harder to engage with energy when the context is alien and removed from their real existence. (Anderson, 2007)

In terms of protection of students, commentators talk about moral panic and evidence this by noting that there are more studies of sexual

predators on sites like MySpace than actual proven instances. Boyd (2006b) notes: “Moral panics are a common reaction to teenagers when they engage in practices not understood by adult culture. There were moral panics over rock and roll, television, jazz and even reading novels in the early 1800s.”

Staff Development

The second issue facing institutions is the need to understand the nature of the requirement for staff development, given the impact of the Internet in general and web 2.0 in particular. It is well known that most innovative efforts in higher education today are the product of individual faculty members working alone, with the use of innovative approaches and materials restricted to individual courses. Bates (2005) referred to this as the Lone Ranger phenomenon:

Teachers work individually creating their own Web-based materials.... They are essential in most institutions for getting Web-based learning started. They are usually very enthusiastic, and put in a great deal of their own time on developing the materials.... This model of Web-based development fits well with the autonomy of the individual teacher...Lone Rangers are usually self-taught, not just in the use of technology but also in course design. (Bates, 2005, p. 164)

Bates goes on to list the many problems with this model: quality issues, workload for the individual (and possible burnout) and scalability. In short, he concludes, Lone Rangers are amateurs, not professionals. Teamwork is imperative in designing, supporting and presenting online courses. However, has web 2.0 thinking changed the model yet again? Waller, in his article entitled ‘Are We All Learning Designers Now?’ reflects on the process of course design thus:

I used to explain that to create a good piece of instruction you needed at least three people, each from different disciplines. The subject matter expert (SME) is the person who knows a great deal about the subject in hand and may have already delivered face to face courses in the same vein. They will know how to test individuals on their knowledge and proficiency of the subject once the course has ended. To be able to transfer the knowledge, especially using technology, an instructional designer must look at the material that the SME supplies and work out a way that will make the technology assisted version just as good if not better than the ‘chalk and talk’ variety. There will be few people who can do

both of these roles. Lastly a programmer will interpret what the instructional designer says and convert it into graphics, assessment tests or flash animations or whatever else is required. Again, few people exist who can do any two of these roles let alone all three. But is this all now old hat? (Waller, 2007)

He points to the range of rapid content production tools now available which allow anyone, regardless of experience, to create a learning program. He cites the call to cede control of learning to the learner. Nevertheless, he concludes that the evidence of 'death by podcast' courses and 'let them get on with it blogs and wikis' clearly show the need for better course design. In fact, he thinks that a disproportionate amount of the process of offering courses should be devoted to designing them.

What does all this mean for institutions trying to support academics in designing innovatory courses? The answer is not a monolithic training programme for all staff, but rather a multi-faceted approach with a wide range of strategies and types of staff development. Some examples include:

- Case studies could be developed from within the institution of successful uses of innovatory course designs.
- Communities of practice should be encouraged, both inter- and intra-institution.
- Opportunities for sharing and re-using resources might be encouraged and supported through banks of teaching resources.
- Rewards or time allowances for academics wishing to develop innovatory course material.
- Seminars and workshops led not just by early adopters, but also by less enthusiastic users.

It will take time for institutions to adjust to web 2.0 and the many changes it might bring, but all the while, web 2.0 applications will continue to evolve, making the process of change much more complicated. Web 2.0 is a potentially disruptive technology because of its potential to change the model of higher education from institution-controlled, teacher-centric, to a more student-centred model.

Assessment Processes

A third area of contention for institutions and one in which they have created problems for themselves is that of assessment. Most educational institutions remain rigidly tied to the idea of developing and assess-

ing individual attainment. Obviously assessment is connected with accreditation and quality assurance—two very important elements in educational institutions’ decreasing armoury of weapons against the onslaught of social perceptions of an over-priced, ivory-tower, feather-bedded profession. Against the onslaught of web 2.0, individual assessment is increasingly problematic, however. Plagiarism detection software is the usual institutional response. On this subject, Weller (2007b) blogs:

My feeling though is that plagiarism is a symptom of old-fashioned assessment techniques, and to put effort into plagiarism detection is to miss the point. What a plagiarism susceptible system reveals is an unhealthy emphasis on content and an old-fashioned world-view. If you assume that all content is freely available (not necessarily true, but let’s go with it as a starting point), then if you ask students to create content then of course they’re going to lift bits from various sources, whether intentionally or unintentionally. There is an argument that the assessment method is going contrary to the connectedness of the modern world here, although acknowledging others is always good practice. But my point is that if we took this as a base assumption we would devise different assessment methods. There is nothing about the conventional exam or essay that is an absolute measure of academic quality—in fact you can view these as administrative conveniences based on the face to face, physical constraints of education. Finding ways of perpetuating them by ‘catching’ plagiarism to me just demonstrates a lack of imagination. (Weller, 2007b)

While the idea that we should enable each individual to develop to their full potential is laudable as a social goal, knowledge and creativity in a web 2.0 world are dependent on engagement within wider social networks. How can this be developed within education systems based on individual attainment? Despite the fact that many studies show that learning takes place in a much wider context than the formal classroom, education systems remain wedded to attainment against a narrow curriculum of formal knowledge. Informal learning is hardly acknowledged, much less fostered and facilitated. Critical to such an understanding is a basic need to shift thinking from ‘learners engaging with institutional provision and procedures’ to ‘the institution engaging with the learner’. This would imply that institutions have to recognise the new cultures of learning and networking, and engage with those cultures.

Yet that involves a profound change in institutional practice and procedures, curriculum organisation, and pedagogic approaches. Individual achievement acts as a substantial barrier to collaboration, reflection and feedback, and to project based group work. Stiggins (2004) distinguishes between the assessment *of* learning and assessment *for* learning. The assessment of learning seeks to discover how much students have learned as of a particular point in time. Assessment for learning asks how we can use assessment to help students learn more. Moving to assessment for learning would allow the introduction of wider forms of assessment including group, peer and self-assessment. Of course, there is an issue as to how much learning is actually taking place through participation and engagement in social networking sites, but the aim should be to understand and improve this activity, not exclude it.

Assessment 2.0

Some leading edge practitioners are beginning to talk about how web 2.0 tools can be embedded into assessment. They view the tools as offering a rich environment for finding, capturing, describing, organising and sharing evidence for assessment purposes. Elliott (2007) gives a specific example:

For example, when undertaking an assessment, a student could use Live Search to search the world wide web for relevant information, subscribe to a number of RSS feeds using Bloglines to monitor appropriate websites, and check Wikipedia for appropriate articles. Relevant web pages could be saved using Furl or parts of web pages could be grabbed using Clipmarks. Google docs and spreadsheets could be used to pull together this information into an initial report, which can be stored online using Box.net. The whole project can be coordinated using a dedicated home page created using Netvibes, which would include RSS feeds, calendars, instant messaging, e-mail and a range of additional 'gadgets' relevant to the assessment task. Throughout this process, students can learn from one another by sharing their discoveries through such services as Furl and Clipmarks, which permit students to subscribe to one another's archives—or rate archived material to identify the most relevant information. (Elliott, 2007)

Elliott goes on to suggest ways in which issues of authenticity and ownership of the evidence can be assured—by examining the e-mail messages, forum contributions, and blog posts for authorial tone and literacy, or by using Skype for remote oral questioning of learners to assess whether the learner actually understands what has been submit-

Table 5.1

Assessment of learning	Assessment for learning
Purpose of portfolio prescribed by institution	Purpose of portfolio agreed upon with learner
Artifacts mandated by institution to determine outcomes of instruction	Artifacts selected by learner to tell the story of their learning
Portfolio usually developed at the end of a class, term or program—time limited	Portfolio maintained on an ongoing basis throughout the class, term or program—time flexible
Portfolio and/or artifacts usually “scored” based on a rubric and quantitative data is collected for external audiences	Portfolio and artifacts reviewed with learner and used to provide feedback to improve learning
Portfolio is usually structured around a set of outcomes, goals or standards	Portfolio organization is determined by learner or negotiated with mentor/advisor/teacher
Sometimes used to make high stakes decisions	Rarely used for high stakes decisions
Summative—what has been learned to date? (Past to present)	Formative—what are the learning needs in the future? (Present to future)
Requires extrinsic motivation	Fosters intrinsic motivation—engages the learner
Audience: external—little choice	Audience: learner, family, friends—learner can choose

Source: Barrett (2006)

ted. The paper also includes an analysis of a wide range of web 2.0 tools suggesting their applicability for various assessment types: summative, formative, individual, peer and group.

Barrett (2006) examines e-portfolios comparing their use as assessment of learning versus assessment for learning. She has created Table 5.1.

It is evident from this list that long-held learning beliefs about assessment and established educational methods must be reshaped in order to incorporate the benefits of web 2.0.

CONCLUSION

Course designers need to exploit the skills students have developed outside formal education without pandering to their desire for instant gratification or shallow thinking. They must see their role as expand-

ing, not contracting because content is no longer the primary requirement. In short, they are not being asked to abdicate their authority, but rather to direct it in a different direction. Courses which exploit web 2.0 technologies and approaches can also be challenging and demanding if they require critical thinking skills and develop knowledge rather than mere information management.

For students, the tools may change, but the real work of analysis, synthesis and deep level engagement with ideas, should not change. For institutions, there may well be a sea change that requires re-thinking many sacred cows such as control, authority and ownership. This change does not signal the death-knell of formal education anymore than the growth of libraries did. Libraries have existed as long as universities; the web is a somewhat different form of library—full of learning potential, and requiring, not undermining, universities as a means of actualising the potential of learners.

6

EVALUATING COURSE DESIGN AND UNDERSTANDING ITS IMPLICATIONS

WHAT DOES IT MEAN TO EVALUATE COURSE DESIGN?

If the basic principle of ‘designing by learning outcomes’ is followed, evaluating a course would seem to be a simple process of gathering data to see whether students have achieved those learning outcomes. This form of evaluation usually is carried out, at best, by questionnaires and sometimes interviews with students, and, at worst, by considering students’ final grades. The shortcomings of both of these methods are legion (e.g. Garson, 2007). Nevertheless, they both ‘work’ as long as the questions posed by the evaluation are answerable by simple quantitative or qualitative data. However, as we have said throughout this book, web 2.0 is not just a set of technologies; it is also an attitude toward teaching and learning. Evaluating attitudes or the degree of change in either teachers or learners is much more complex, and given that both the attitudes and the technology are in continual evolution, traditional approaches to evaluation are no longer appropriate.

We suggest that one of the implications of web 2.0 attitudes and technologies is that course design needs to be seen as ‘emergent’. Defining the learning outcomes, curriculum, activities and assessment before the course even begins (which has traditionally been common practice with distance-taught online programmes) becomes problematic if the web 2.0 concepts of student empowerment, user generated content, and harnessing collective intelligence are truly adopted by the course designers. There is an apparent mismatch between centralised control (traditional course design) and increased user control (course design

reflecting web 2.0 practice). The essence of web 2.0 activity is democratic; higher education is *not* democratic. It is authoritarian, controlling and top-down. The use of wikis exemplifies this clash very well. Developing content collaboratively conflicts with academic notions of authorship and intellectual property, of individual assessment, and of individual rewards for contributions. People are clearly willing to make anonymous contributions to Wikipedia, but are students willing to do this in the context of a for-credit course with all the concomitant baggage of traditional higher education? The 2006 FutureLab Report on learning networks struggles with this very dilemma:

This approach suggests that education should focus on learners as subjects rather than as objects within a system. This changes the emphasis of education and requires the development of learning episodes for pupils that have dialogue and communication as core features. From this perspective there is a far greater emphasis on networked rather than linear models of learning, and on providing culturally relevant, experiential and purposeful learning episodes, rather than the consumption of abstract knowledge in environments alien to that in which the knowledge was both created and will be applied in the future. (Rudd, Sutch & Facer, 2006, p. 5)

This change has also been described as a move from analytic knowledge to synthetic knowledge (Brown, 2000). Such a move has implications not only for course design, but also for evaluating it.

EMERGENT COURSE DESIGN

Emergent design is a name used by Cavallo (2000) to describe a theoretical framework for the implementation of systemic change in education and learning environments:

The phrase Emergent Design puts a spotlight on the need...to study the conceptual space where the purposeful stance implied by the word “design” mates with the openness implied by the word “emergent.” The emphasis on *emergence* as the guiding principle does not imply that this is an anything-goes environment reacting to the whims of the participant teachers and learners.... We brought a very disciplined set of principles, methodologies, tools, activities, models, and exemplars for learning environments. However, to deliver a pre-set curriculum with pre-chosen problems, explanations, and sequence of events would be not

only antithetical to the underlying learning philosophy, but also it would be incapable of taking advantage of the very benefits that the technology affords. (Cavallo, 2000)

Although Cavallo's context was rather different, the term *emergent design* seems to be very applicable to the context of designing courses with a web 2.0 pedagogy: student-centred, user generated and collectively developed. However, as Cavallo suggests, empowering students to create content, learn from their peers and make choices about how they contribute to the course, does not mean that the course design is laissez-faire, and the teacher's role is just to stand by (virtually) and let students do what they feel like. The design of web 2.0 courses is different but not 'lesser', and requires as much if not more skill than preparing content for a lecture course or writing material for a distance taught course. Thompson and MacDonald have also adopted an emergent design approach and note:

Ideally, design is ongoing throughout the delivery of the course. A course that lends itself to rapid re-design as learners' needs become better articulated and understood leads to a quality eLearning experience. (Thompson & MacDonald, 2005)

As a result of their evaluation of online courses using an emergent design approach, they propose four factors which are critical to this method of course design:

1. Keeping your finger on the pulse of the learning experience by creating opportunities to collect and act on feedback.
2. A modular course design that enables quick modifications.
3. Access to resources (time and money) and skilled professionals in order to implement just-in-time changes.
4. A willingness for e-moderators to play dual roles as both facilitator and designer.

In a similar vein, McWilliam (2005) writing in the *Journal of Learning Design*, talks about the need for teachers to 'unlearn' many of their tacit conceptions of good pedagogy. One of her seven 'deadly habits' is the assumption that curriculum must be set in advance:

If pedagogy might be rethought as the co-creation of value, then curriculum cannot be 'fully formed' and set in place in advance of pedagogical activity. This of course flies directly in the face of the heavy investment in National Curriculum Frameworks for schools in both the UK and Australia. While this does not imply that teachers have a new licence to be unprepared for pedagogical

activity, the nature and purposes of *what counts as preparation* must change. From fixed and immutable, curriculum needs to be conceptualised as *content for meddling with*. (McWilliam, 2005, p. 7)

Another of her deadly habits that is particularly applicable to designing with web 2.0 tools is the assumption that teachers should know more than students. Given the volatility of the web 2.0 tools, and their ‘ownership’ primarily by young people, course designers are unlikely ever to be as conversant with the range of tools described in this book as those who use them regularly for leisure and entertainment. However, what is needed (and what we have tried to do in this book) is to give teachers and course designers an understanding of how to use these tools in ways that promote learning. McWilliam talks about ‘useful ignorance’ as a space of pedagogical possibility rather than a lacuna. ‘Not knowing’ can be put to work without shame or bluster. McWilliam’s ‘not knowing’ is very similar to the notion of learning how to learn:

Our best learners will be those who can make ‘not knowing’ useful, who do not need the blueprint, the template, the map, to make a new kind of sense. This is the new habit that teachers need to acquire—the habit of being usefully ignorant. (McWilliam, 2005, p. 4)

Common course design principles have proposed a rational planning model in which the educational philosophy comes first, the pedagogy is derived from it and the course strategy derived from the pedagogy. It is hard to imagine that this model was ever followed except as a post hoc rationalisation for a particular course design. In fact despite an extensive literature on course design for higher education, most instructors work mainly from intuition, influenced heavily by how they themselves were taught. Furthermore, most teachers assume that content is the starting point of course design. Irlbeck, Kays, Jones & Sims (2006), explain it thus:

Traditional ID (instructional design) often assumes a top-down design process with experts in content and design principles creating the environment and content. Models range from the conventional ADDIE model to more complex designs such as Tennyson (1999), but all assume that experts decide objectives, assessment criteria, outcomes, and learning activities. This has been enshrined in a set of best practices developed and approved by accrediting associations. Emergence theory suggests a radical alternative...that design should proceed from the ground-up rather than

from the top-down.... Experts may still be called upon for the establishment and articulation of intended course outcomes, but the driving force resides in the behaviour of the students and the interactions between instructor-learner, learner-learner, learner-content, and learner-interface. (Irlbeck et al., 2006)

This leads to another implication of emergent design, and one that many instructors find very difficult to accept: that they must reduce the amount of content they can 'teach' on a networked, interactive and student-empowered course. If students are encouraged to generate content, even in the form of online messages to forums, if they are expected to engage with a range of technologies (e.g. an e-portfolio, a blog and a wiki), the amount of content, the subject areas, and the number of issues addressed by the course must be reduced. Students do not have the time to cover the same amount of content as in traditional courses as well as contribute to that content and use a range of demanding and interactive media. It is well known from many evaluations that online interaction (writing and even reading forum messages) is very time-consuming (Jones & Johnson-Yale, 2005; Kear, 2004). In theory, this should be welcomed by teachers, as they can scale down the amount of content on the course; however, in practice, academics are reluctant to reduce the areas covered and still equate quality with quantity. In short, they do not trust the power of peer learning, the importance of self-expression as a means of learning, and above all, the need to value the learning process over the content that is learned.

Emergent design can be seen as a method of designing for the unexpected, of assuming that it is impossible to anticipate how students will use the tools or tackle the activities. An example of this in relation to the use of e-portfolios might be to provide a template for those who do not want to engage with the presentation aspects of the tool, but to also provide the means for those students who do want to design the look and feel of their own e-portfolio.

EVALUATING EMERGENT-DESIGNED COURSES

Web 2.0 approaches applied to the practice of evaluating courses, leads to the conclusion that students should participate in the process, not just by completing questionnaires or taking part in focus groups, but by actually proposing the evaluation issues and criteria. However, this would certainly pose a problem for some kinds of evaluations. In higher education, institutions usually require evaluation data to demonstrate effectiveness to funders and other stakeholders, and to provide

a measure of performance for marketing or staff promotion purposes. Educational evaluation is also a professional activity that individual educators undertake in order to continuously review and enhance the learning they are endeavouring to facilitate. This latter kind of evaluation, when applied to courses espousing a student-empowering philosophy, would be appropriate for student engagement in the process. One question which the participant evaluators should consider is whether there were any unintended or unforeseen consequences of studying on the course. Some consequences may be positive and some may be negative. These unintended consequences may be as important as the intended consequences. So evaluations should measure not just whether the course does what it should be doing, but what else it may be doing.

Blogs are a good tool for participant evaluation: students can reflect on what they have learned on the course, and even more significantly, they can be encouraged to evaluate their own performance on the course. Alternatively, a group document could be produced by using a wiki set up to evaluate the course. Students could be asked to include an evaluation of the software tools on the course and to make links to the many reviews available on the web about particular web 2.0 tools.

Evaluating the extent and value of another web 2.0 characteristic—collective intelligence—is a challenging issue, especially if traditional notions of evaluation are applied. Most education focuses on producing autonomous learners, whereas collective intelligence encourages ownership of work as a group. We need to think very differently about evaluation as well as develop new approaches to its application to web 2.0 sorts of courses.

GENERAL OVERVIEW EVALUATIONS

So far, there are few evaluations of courses which integrate web 2.0 tools rather than merely adding them on the periphery of an existing course. However, there are a number of overview reports and studies evaluating the dangers, limitations, benefits and challenges of using these technologies in teaching. Three examples of these reports are:

1. *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century* (Jenkins, 2006)
2. *Emerging Technologies for Learning*, Vol. 2 (BECTA, 2007)
3. *Social Software and Learning* (Owen, Grant, Sayers & Facer, 2006)

*Confronting the Challenges of Participatory Culture:
Media Education for the 21st Century (Jenkins, 2006)*

The first report was commissioned by the MacArthur Foundation to help determine how digital technologies are changing the way young people learn, play, socialize, and participate in civic life. The report tackles the question, ‘why do people learn more, participate more actively, engage more deeply with popular culture than they do with the contents of their textbooks.’ The report notes:

While formal education is often conservative, the informal learning within popular culture is often experimental. While formal education is static, the informal learning within popular culture is innovative. The structures that sustain informal learning are more provisional, those supporting formal education are more institutional. Informal learning communities can evolve to respond to short-term needs and temporary interests, whereas the institutions supporting public education have remained little changed despite decades of school reform. Informal learning communities are ad hoc and localized; formal educational communities are bureaucratic and increasingly national in scope. We can move in and out of informal learning communities if they fail to meet our needs; we enjoy no such mobility in our relations to formal education. (Jenkins, 2006, p. 9)

Despite this level of informal learning, media literacy still needs to be taught, the report claims. For the same reasons that a library full of books does not necessarily mean that readers will learn very much, so without encouragement to reflect and direction in how media are used, learners may gain little from spending their time engaging with web 2.0 tools. The lesson for course designers is to capture some of the qualities of informal uses of web 2.0 tools while introducing structure and direction into learners’ engagement with them.

The report also tackles another hotly debated issue of young people’s preoccupation with leisure and social uses of web 2.0 tools: their habit of multi-tasking. Many teachers regard multitasking as a decline in students’ attention span with the rise of digital media. The report makes a case for multitasking as “a method of monitoring and responding to the sea of information around us”. It claims that students need help

distinguishing between being off task and handling multiple tasks simultaneously. They must learn to recognize the relationship between information coming at them from multiple directions and making reasonable hypotheses and models based on partial,

fragmented, or intermittent information (all part of the world they will confront in the workplace). They need to know when and how to pay close attention to a specific input as well as when and how to scan the environment searching for meaningful data. (Jenkins, 2006, p. 36)

Emerging Technologies for Learning, Vol. 2 (BECTA, 2007)

The second report was commissioned by the British Educational Communications and Technology Agency (BECTA, 2007) to help educators consider how emerging technologies may impact on education in the medium term. The first chapter discusses the educational benefits of blogs, wikis, and most of the other social software tools listed in chapter 4 of this book. Social bookmarking, for instance, the report says, is “ideally suited to classroom use as it enables groups to build up a collection of resources very easily around a particular topic such that each individual can benefit from the work of others”. Social tagging, the application of free-text keyword tags that others can see and share, is potentially even more revolutionary, the report claims,

because it provides an alternative means of categorising and organising knowledge based on emergent usage rather than pre-determined classification. Potentially, this gives people a tool for developing language and negotiating shared meaning that acts as a counterpoint to one of the main sources of institutional power in education: control of language and terminology. (BECTA, 2007, p. 12)

The success of these social networking tools is due to people’s preference for sharing objects as a form of sociality rather than contributing to general discussions (p. 13). This chapter of the report concludes with the prediction that

we can expect to see social tools being used to help develop critical skills such as networking, search and assimilation of new topics, sense making, pattern recognition and decision making, as well as in the development of shared values. These tools are about connections and context not content...they support learning as a process, not an outcome, and encompass a more diverse range of learning and behavioural styles than perhaps any previous generation of technology. But perhaps more interesting is the fact that they operate at the intersection of technology, teaching and creativity. (p. 18)

Social Software and Learning (Owen et al., 2006)

The third overview evaluation document to be considered is a report by Futurelab, *Social Software and Learning*. One of the most interesting aspects of the report is the discussion of social bookmarking. It notes that the bookmarking activity becomes social when tagging is added to the functionality; that is, when users add a tag or keyword to the links they create:

This process of organising information through user-generated tags has become known as “folksonomy”. It implies a bottom-up mode of organising information as opposed to a hierarchical and top-down taxonomy. Rather than visualising information as contained within a hierarchical tree structure, it is contained within sets, which may overlap one another, allowing information to be within two categories at the same time. (Owen et al., 2006, pp. 17–18)

A folksonomy is therefore the opposite of a taxonomy. The latter is hierarchical, designed by experts, and each item fits only one category. A folksonomy is not hierarchical and emerges from popular usage. The report goes on to discuss the limitations of the folksonomy process:

- The use of synonyms is uncontrolled, so the tag *blog* does not get URLs tagged with the word *weblog*.
- People use the same tag word to refer to quite different things.
- Tags can be categories, descriptions, opinions and comments, and a mixture of all of these.

This has led to calls for greater control, especially as the number of users grows and the type of content bookmarked becomes less predictable. The report quotes Shirky (2005) who claims that imposing a defined structure on social tagging would counter the whole notion and value of social tagging because it is the very fact that tags emerge from the user group’s actual practices rather than following a pre-determined structure that makes a folksonomy powerful. Of course the scale and activity level of the user base are critical to systems of social tagging. It is the combination of tags, and access to the context in which they were tagged (by whom, and when) which provides more information, in a human social context, than can ever be the case with a search engine.

This discussion sums up many of the distinguishing elements of web 2.0 activity: user-generated, sharing, wisdom of the crowd, bottom-up rather than top-down, and personalised rather than one size fits all. The early educational uses of forums were all about interaction; social

networking takes interaction into a new dimension. All three of these reports point to a new direction for education:

- the need for learners to be innovators and creators of knowledge, not mere recipients of it
- the need for learners to be able to operate in an information-rich environment.

The implications of these two requirements are that the curriculum must adapt to reflect new ways of working, living and learning that are evolving outside higher education. The strong boundaries around subjects are increasingly inappropriate; through social networking, knowledge is less convergent and more divergent, linked and multi-sourced. Trustworthiness of resources is a significant issue for users and developing judgment is a critical skill in all disciplines.

A common reaction to these overview reports from those academics who claim that their discipline is 'different', is that students still need a solid grounding in the fundamental building blocks of their subject; that students need to know what others have discovered, proved, and legitimated before they can innovate or be creative. This is a classic response that perpetuates traditional ways of teaching and tends to be from faculty who do not opt to come to training and staff development events, do not read papers about web 2.0 tools and do not experiment with new ways of teaching. Nevertheless, because research communities are beginning to use various forms of social networking, these 'refuseniks' may soon be exposed to the tools and see the benefits for their own research work. Another driver for change may come from their students who will increasingly demand a different teaching style.

TECHNOLOGY-SPECIFIC EVALUATIONS

Carnegie Mellon has produced an excellent evaluation of podcasting (Deal, 2007). It begins by defining three applications of the technology:

1. creating audio (or video) archives of classroom lectures;
2. creating or referencing supplemental course materials;
3. assignments or activities that require students to create podcasts.

The report examines the strengths and weaknesses of all three applications by extensive desk research of the theoretical and practical literature. For example, it notes that, contrary to lecturer fears, most students perceive lecture podcasts as a tool for review rather than as a

license to skip lectures. However, in commenting on this finding, the author goes on to say:

No studies to date have shown evidence of any effect, positive or negative, on learning outcomes. Some critics point to this disconnect between students' perceptions and reality as evidence that students might overestimate the usefulness of reviewing recorded lectures—possibly drawing them away from more effective study strategies. (Deal, 2007, p. 5)

The report quotes other studies which show that by adding RSS feeds to the lecture podcasts, the usage by students increased dramatically. Related to this is a more dramatic finding:

One of the most surprising findings from these studies—and the most consistently reported—is that a majority of students report using lecture podcasts at home or on a computer, rather than in a mobile environment with a portable device. (Deal, 2007, p. 6)

This evidence is particularly significant in that it undermines so much of the hype about podcasting, such as its flexibility and mobility being in keeping with student lifestyles, and predictions that students would listen to podcasts while commuting, exercising, and driving. The report references three research studies from cognitive psychology which clearly demonstrate that simultaneous processing (i.e. multi-tasking) diminishes performance. Presumably students, whether consciously or unconsciously, realise that in order to use a lecture properly, they need to be in an environment where they can concentrate. This discussion of multitasking presents a different perspective from the MacArthur report cited above.

The second use of podcasting described in the evaluation offers another sort of potential. On the one hand, supplemental material can be made available as open content on the web for people around the world who do not have access to higher education material. The report cites examples of this use by Harvard Extension School. On the other hand, podcasting can be used as a vehicle for delivering course content, while reserving the face-to-face lecture time for interaction, student presentations and discussion.

Supplemental materials have a much better track record of positively influencing learning outcomes and student performance. That record is not surprising, given that these types of materials are often much more thoughtfully approached, designed with clear educational goals in mind, and produced specifically to take advantage of the podcast format. (Deal, 2007, p. 8)

The third application is the one with the most student-centred learning approach: student-generated podcasts. The report describes these in relation to student assignments and discusses several successful applications, particularly one which required students to work in pairs.

The report concludes with the question, 'Does podcasting enhance education?' It answers the question by saying that podcasting has no inherent value; it requires good course design and appropriate application.

Another technology that has been the subject of detailed evaluation is digital games as a tool for learning. Several special issues of journals have been devoted to gaming in education and indeed there is at least one journal devoted entirely to issues around games in education. However, if we restrict the analysis to higher education applications and focus on what could be categorised as web 2.0 games (social, networked and on the web), the number of in-depth evaluations is quite small. One of the issues arising from educational evaluations is whether and how learning outcomes can be identified or measured. On the one hand, Smith's research led to the following claim:

It is a characteristic of games that they often don't deliver knowledge in a form that is easily measured or evaluated by fixed standards. It is more appropriate to speak of general skills like level-headedness, analysis and the ability to understand and interact with rapidly changing environments. (Smith, 2002)

However, many other discussions of games make many assumptions about student learning outcomes. A number of evaluations of gaming, therefore, use activity theory as the methodology for research (Pelletier & Oliver, 2006; Squire, 2002) and aim to concentrate on how students actually play the game, how they solve problems and develop strategies. This approach helps to counter unsubstantiated claims about what students learn from games. Squire provides a rationale for his use of activity theory in evaluating learning outcomes:

Activity Theory provides a theoretical language for looking at how an educational game or resource mediates players' understandings of other phenomena while acknowledging the social and cultural contexts in which game play is situated. Learning is conceptualized not as a function of the game itself—or even a simple coupling of the player and game; rather, learning is seen as transformations that occur through the dynamic relations between subjects, artifacts, and mediating social structures. (Squire, 2002)

Oblinger (2004) begins her analysis by confronting a myth about games:

While the mental image that college and university personnel may have of game playing is a solitary student with a game console, the reality is that games are highly social. Students play games in groups; they play with and against others; they discuss games in online communities; they add on to existing games, sharing their work with others. (Oblinger, 2004)

She talks about the informal use of games by students as encouraging collaboration and hence setting the groundwork for peer-to-peer teaching. She notes that popular games have online communities of players, debating games, sharing game tips or offering critiques to designers. This reflection on the process of game playing is analogous to meta-cognition, an important learning skill.

When used formally on courses, games encourage students to mobilize a wide range of information to solve the game-related problem, and hence create an alternative learning approach from memorizing facts. The most significant thing about really successful games is their immersive quality—this is what is motivational for students. Foreman compares games with a well-designed formal course:

The game world resembles a well-designed academic course, one that (1) builds and integrates knowledge in a structured continuum that leads from the beginning of the semester to its end; and (2) requires that a student actively and continuously engage with subject matter and learning goals. (Foreman, 2003)

Kambouri, Thomas and Mellar (2006) have carried out a case study in adult education looking at the use of a game to teach literacy. They show that by supporting learners in taking control of and self-regulating their own learning, the results exceeded the expectations of both the game designers and the teachers. The learners made use of instant messaging as an additional communication medium, thereby increasing the literacy outcome of the game.

THE STUDENT VIEWPOINT

At the beginning of this book we asked whether students actually want their courses to use web 2.0 tools. A number of studies have begun to tackle this question by asking students what technologies they currently use for their study (Conole, Oliver, Falconer, Littlejohn & Harvey, 2006)

and how much technology they want to see used on courses (Kvavik & Caruso, 2005). The evidence from these and other studies is that students are definitely using a wide range of tools, such as mobile devices, social bookmarking, and Google, and they do want a moderate amount of IT to be used on their courses. However, because the number of academics engaging thoroughly with web 2.0 tools and designing courses which embed these technologies (rather than using them peripherally or using them in web 1.0 ways) is so few, it is still too early to say whether students in general would welcome learning through these tools, rather than merely using them as peripheral support tools.

Obviously it would be foolish to ‘throw away’ centuries of structured knowledge-building in a headlong rush to adopt social networking practices. Clearly there is a place and role for knowledge to be organised for the learner by others with acknowledged expertise. Newcomers to a knowledge domain will find it more efficient to access a structured resource than to try to grapple with multiple representations arising from social shaping. Finding the balance between the two extremes is the art of the teacher!

QUALITY ASSURANCE IN A STUDENT-EMPOWERED ENVIRONMENT

Like evaluation studies, quality assurance processes need to change to reflect the new perspective on learning that social networking brings. There are many dimensions to the issue of quality assurance: at a macro level, it can be about return on investment and reporting to stakeholders; at the micro level, quality should be about relevance to learners’ development. Quality assurance of a particular course is a similar process to evaluation and arguably should also involve the learners. After all, the ultimate purpose of both is to improve the learning process:

Quality development has to be seen as a process of negotiation in which all stakeholders need to participate. The aim of such a participative model for quality development is to define the values and objectives of the learning process together among the stakeholders. Such an active participation of learners will play an important role in future quality development systems. The learners have an active role in these concepts and need to be aware of their personal proposals and demands. (Ehlers, 2007)

As we have seen, the web in general and Wikipedia in particular contain a plethora of un-authenticated, unfiltered information. Qual-

ity in higher education has traditionally been associated with control; but web 2.0 is characterised by lack of central control and empowerment of users. Many institutions have responded by keeping their social networking uses for teaching behind their institutional firewall. Similarly, the primary institutional response to the undoubted problem of plagiarism is to develop and use detection software. An alternative response would be to teach students how to be critical users of websites and to re-design assessment to test process rather than content. In short, attitudes to quality assurance and processes for judging it need to be rethought.

EMBEDDING INNOVATIONS

There is a well-established literature on the processes of embedding innovations in institutions in general and in higher education in particular. A recent paper by the Australian Flexible Learning Framework provides an excellent analysis of embedding e-learning innovations in educational institutions. It begins by summarising existing literature:

A broad range of enablers, barriers, implementation models and frameworks are well documented in the literature. While there are different configurations for local contexts, a synthesis of the content highlighted a common and consistent message; namely the embedding process must be based on a clear vision for e-learning, be driven by champions, explored from multiple perspectives, involve a range of stakeholders over a period of time, have committed support and that there is no one way to do it. In other words, embedding innovative e-learning is about systemic change. (Jasinski, 2007, p. 2)

From this list of requirements, it is evident that while many institutions have all of these requirements in place regarding e-learning in general, very few have them all in place regarding web 2.0 tools. The report suggests that some innovations merely require incremental change, while others require radical change. The peripheral uses of web 2.0 tools that are common in higher education give evidence of the fact that incremental change is far easier to effect than radical change. Furthermore, incremental innovations are more likely to be adopted and embedded than more radical changes that challenge the dominant model. Examples of this distinction are evident throughout this book:

- The use of blogs has almost been mainstreamed now, although perhaps not in all disciplines, as their predecessors (learning logs and reflective practices) have something of a tradition in higher education.
- Changes to the whole assessment process to include collaborative content on wikis and in general to assess process rather than content, are much more radical and will take longer to win support and champions.
- Mobile devices are seen as peripheral support tools and are unthreatening due to the ubiquitous use of mobile phones, so their use for education is easily adopted.
- Podcasting as an alternative access mode to lectures will be embedded without quibble, but as a medium for students to create content, it will be seen as more radical and less acceptable.
- Social networking is dismissed as trivia and understanding its power and implications for learning will be a much more radical change.
- The notion of passing control to learners is very challenging to most educational institutions and they rightly or wrongly point to the dangers of web 2.0 tools and the fact that not all learners have access to them. This aspect will probably be the most difficult to embed.

The report notes that innovative practitioners are outpacing the readiness of institutions to support and condone them. This is true of most innovations in any domain. However, one research finding from the report was particularly relevant to web 2.0 applications, and relates to the need for diverse strategies and styles of practice across the range of staff that are required to embed innovation. The report identifies four of these:

1. Exploring (discovering new perspectives and territory)
2. Visioning (developing a long-term purpose and path to achieving it)
3. Experimenting (trying out novel combinations)
4. Modifying (building on past achievements)

It claims that most innovators tended to have one particular innovation style: exploring, and this was off-putting to staff with a different approach (Jasinski, 2007, pp. 6–7). Therefore, raising the profile of other approaches to innovation is key to attracting a broad range of staff to participate.

INDIRECT EDUCATIONAL USES OF WEB 2.0

Research for this book produced a very extensive list of institutional uses of social software—even more extensive than the number of courses actually embedding it into the design. Just as many businesses are adopting web 2.0 strategies for marketing, branding and general awareness-raising, so the more business-oriented aspects of formal education are doing the same. Examples include:

- Social bookmarking by libraries
- Podcasts for alumni
- RSS feeds for administrators
- YouTube video tours of the campus for new recruits
- Instant messaging for student queries about the registration process
- Wikis and blogs for research and scholarship

These are no doubt equivalent to the peripheral uses of web 2.0 tools by educators. They are enhancers and tasters but may still act as support for embedding these tools into mainstream institutional use in that they set a precedent for instructors and could well act as a driver for faculty to engage with these tools. For students, they may also create expectations that these tools will also be used on courses.

HOLISTIC COURSE DESIGN

Given that most course designers will not be starting with a blank sheet, but rather patching up, adding to, or fitting in with an existing programme, how is it possible to use holistic design principles? Even more fundamentally, how is effective course design communicated? The literature is full of models and representations of how to design courses, but we suspect that these are high-minded academic exercises that are rarely used in practice. More useful are discussions with colleagues, whether face-to-face or online, although the closer the examples from others are to one's own discipline, the more easily they are assimilated and used.

When making changes to an existing course, it is important to keep a number of elements in balance. This might involve changing a number of aspects of the course, not just one. In our experience, the following considerations need to be balanced:

- The amount of online versus offline work;
- The types of study configurations: individual, small group, large group;

- Work in private spaces and work in public spaces;
- Opportunities for individual creativity and choice, but training and scaffolding for those not yet skilled;
- Support for the development of learning literacies (how to learn, how to analyse and criticise) as well as technical literacies (how to learn through web 2.0 technologies).

More important than all of these, however, is the need to balance student workload. Of course students will always complain that there is too much to do or to study, so it is crucial to be reasonably sure that any changes made to the course do not create workload problems for either the teacher or the student. This can be hard to predict without experience of the kinds of demands that online interaction can make. Some novice designers put their toe in the water by saying that their additions are optional. This is rarely a good idea because most activities need a critical mass of students to participate in order to be successful. Time-challenged students (and that is the majority nowadays) will ignore anything that is optional.

Another way of checking whether a course design is balanced, or remains balanced, is to look at the course as a whole and make sure that there are opportunities for learning in the following ways:

- Assimilating information—this is rarely a problem and all too often is the only approach used on courses. It consists of reading papers and textbooks, and listening to lectures. It could also involve viewing vlogs, photos and other visual material.
- Communicating—this mode is increasingly common through online discussions and debates with peers and tutors, and now through online presentations.
- Producing—once restricted to essays and exams, there are now many more ways in which students can create content. Web 2.0 tools offer opportunities for designing, composing, and remixing through wikis, e-portfolios and social networking.
- Information handling—this method of learning needs scaffolding so that students learn how to select and analyse the information that they gather and how to order and manipulate it. RSS feeds are an excellent vehicle for developing skills in information management.
- Experiential learning—Web 2.0 tools are ideal for providing opportunities for exploring and practicing the language and methods of different disciplines. Games, Second Life and even blogging can all be used to give students experience in applying their learning to practice (from Conole & Fill, 2005).

As we have indicated throughout, however, the design needs to put students at the centre and to offer them the opportunity and the environment in which to be active users of the tools by allowing them to create podcasts, rather than using them merely to produce more information for them to assimilate.

DESIGNING STUDENT-CENTRED ACTIVITIES

Littlejohn and Pegler note the evidence that most student activities are designed around a very limited number of learning tasks:

Many tutors may be using the same approaches again and again, with little variation. This means that the vast majority of the available activity types are not being used and are probably not even being considered. (Littlejohn & Pegler, 2007, p. 94)

The most commonly used activity types are assimilative and information handling; communication activities are more common in online education; however, productive and experiential activities are usually overlooked. Littlejohn and Pegler give many examples of the full range of activity types which could be used in higher education, and offer frameworks for thinking through design decisions. As with many other practitioners in this field, they warn against starting with tools, but rather support the notion that tools should be selected on the basis of their appropriateness for particular learning tasks (Littlejohn & Pegler, 2007, p. 133).

Conole and Fill promote the use of a framework to guide course design and claim that:

A more theoretically consistent approach to learning design is needed which inter-relates theory with the desired features of learning, and then maps relevant tools and resources (both human and technical) against these. This approach makes the relationship between practice and underpinning theory more explicit and, we argue, should enable practitioners to make more theoretically informed choices of the tools and resources used to support learning. (Conole & Fill, 2005)

They provide a toolkit containing nearly 30 techniques such as brainstorming, field work, role plays, reflection and syndicates, with interactions ranging from individual, small group, student to tutor, to large group and class based. They have grouped the tasks according to whether they are associative (learning as activity), cognitive (learning

through understanding) or situative (learning as social practice). They conclude that:

The concept of a learning activity [is] the underpinning for the development of a learning activity design toolkit which aims to provide easy to use guidelines for practitioners to make pedagogically informed decisions on designing learning activities and making choices about the use of appropriate tools and resources to support this. A learning activity occurs within a context with a set of associated attributes and addresses a set of learning outcomes. Learning outcomes are achieved through a sequence of tasks and associated roles adopted by the participants which might call upon a set of tools and resources. Some of the tasks are assessed. (Conole & Fill, 2005)

Much of the extensive literature on course design takes a similarly systematic, theoretical, or framework-based approach to the process. Whether practitioners actually use such approaches is another matter; however, even being aware of them or reading about them provides a more informed way to consider course design.

Brown and Voltz (2005) have a more descriptive and less systematic approach to e-learning design. They suggest that activities should “open up opportunities for action rather than direct students down a prescribed pathway” (Brown & Voltz, 2005, p. 3). The activity should involve students in making choices about what experiences to undertake and “be complex enough both to engage and to challenge students for the duration of the study, if not longer” (p. 3). They also remind designers that “the use of an appropriate and clearly evident activity is fundamental to an effective learning outcome, and ensuring that the integrity of the activity is maintained as the focus shifts to the media-focused development stages is an ongoing challenge for the e-learning designer” (p. 3).

FEATURE CREEP

As we have indicated in chapter 4, a characteristic of many technologies and particularly so of web 2.0, is what has been called feature creep or feature annexation or even creeping convergence. This is the characteristic whereby one tool adopts the features of another in order to offer users a single location for a wide range of activities. So, for example, blogging software now offers video blogging or vlogs; e-portfolio software has added many of the features of a virtual learning environment; Second Life has been integrated with Moodle, creating Sloodle;

mobile phones routinely provide a camera and other mobile devices offer phone, camera, Internet access and e-mail. This process has implications for institutional learning environments because they also are obliged to add more and more features (e.g. blogs, wikis, e-portfolios etc.) into their platform.

The course design version of feature creep is the addition of a web 2.0 technology to an existing course in order to address a particular problem or to update the course and make it more attractive. In fact, the more common applications of these technologies in courses are undoubtedly as feature annexation rather than as design creation for a new course altogether. The problem is that adding a web 2.0 technology changes the whole course: the balance between teacher and taught, the role and expectation of each participant, and the benefits and responsibilities are subtly altered. The addition of the new technology may actually address the original problem, but it will also create other problems. This is true for both course design and technology design.

Take for example the addition of video to blogging: on the one hand it benefits those who find writing difficult and it adds a multimedia component to text-based communication. On the other hand, it creates access problems for those on dial-up modems and for those without video equipment. It also changes the whole nature of the communication. There are similar issues with e-portfolio software as it annexes commenting facilities, secure graded assignment returns, and photo repositories, it clashes with and duplicates other institutional provision, thereby creating confusion over where discussion is taking place and where the learning community is centred. However, such an e-portfolio becomes increasingly useful to the owner as a storage facility on which to draw for job interviews, assignments and for lifelong learning.

The same process takes place in course design: a wiki is added to a traditional lecture course to increase student engagement and participation. It may be successful at this, but slowly leads to students questioning the lecturer's authority, or objecting to the traditional exam format which tests only lecture-based material, or is infiltrated with incorrect or malicious information because the lecturer is not used to having to regularly monitor it. Another example is the introduction on a distance taught course of marks for contributions to the discussion board, in order to increase student participation. From the student point of view, this alters the whole dynamic of online discussion—yes, most students will log on and put in messages, but of what quality and for purpose? Many students will create messages for the sake of creating messages rather than to really communicate.

The point is that course design needs to be understood as a holistic process in which all the learning elements are in balance. Technology in itself does not make the defining difference. What is required is more thoroughgoing and appropriate ways of using technology to create a learning environment which is motivating and engaging, yet challenging and rewarding.

SUMMARY

There is considerable argument over whether web 2.0 tools are a revolution or merely an evolution. We will not add to the debate because it seems irrelevant to our purpose here. What we need to understand is how people can learn in this environment and how we as course designers can enhance learning through the right tools and applications.

The key points we have suggested are:

1. We need to trust the power of peer learning and the importance of self-expression as vehicles for developing the kinds of process skills that are of increasing value in a socially networked world.
2. Emergent design is convergent with the use of web 2.0 tools because it makes space for the unexpected and caters for user-generated content.
3. The learning process is more important and more lasting than the recollection of any particular content, and hence should be given more significance in course design than the transfer of information.
4. The art of course design is to capture the essence of the informal uses of web 2.0 tools while introducing structure and direction into students' engagement with them.
5. Passing control of learning to learners will be a very challenging and threatening request for many lecturers and most institutions. This is where the essential feature of social networking conflicts with educational practice.
6. Changes to existing courses require maintaining a balance amongst different kinds of learning opportunities.

Armentano (2007) puts these points more poetically:

An online course is a beautiful collision of technology and education, people and information, ideas and communication, diversity and unification, cultures and communities, students and experts.

The Educational Future of Web 2.0

Anderson (2007) suggests three elements of current web 2.0 practice that look set to have a profound impact on education in the future. The first of these is the notion of the wisdom of crowds, or the power of groups. This emergence of online social networking communities could create a significant threat to universities as the traditional repositories of wisdom and knowledge creation. Anderson's corollary to this possibility is that the issue of online identity and privacy will increasingly become the focus of tension and acrimony. The rise of blogs particularly is already beginning to affect journalism and newspaper circulation. How will universities be affected by the wisdom of the crowd rather than the wisdom of the expert?

His second prediction is that the growth of user-generated content will increase the rise of the amateur and the culture of DIY. These two will also challenge the status of the academy as the elite source of knowledge. Anderson says, "These challenges may not be as profound as some of the more ardent proponents of web 2.0 indicate, but there will be serious challenges none the less".

Finally, he predicts that there will be profound intellectual property debates over the ownership of the huge amounts of data that web 2.0 is generating, along with new tools for aggregating and processing it.

All of these 'futures' point to a large-scale transformation toward a more participatory form of learning, where teachers and learners share the teaching and learning roles, where information is found in blogs and wikis, controlled through RSS feeds and connected through social networking sites. The participatory culture is empowering and while the tools will change, the genie of participation will be reluctant to go back into the teacher-centred bottle of traditional education.

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INDEX

- amateurization 145-7, 177
- assessment 2.0 152-3
- attention economy 50-1, 58
- audiographics 126-131

- Bebo 33
- blended learning 25-7, 38-9
- blogging 3, 5, 10-11, 15, 17, 28, 49, 52-3, 62-5, 119, 121, 126, 146, 148, 160, 170, 171, 174, 175, 177

- CMS 36-8, 42
- collaborative learning 14-15, 35-6, 47, 51, 66-7, 94-5, 125, 167; and bookmarking 81
- complex adaptive system 30-1
- computer conferencing 1-2, 22, 53, 59
- computer games 5, 109-113, 166-7
- connectivism 18-19

- del.icio.us 3, 81, 83
- distributed learning 25-9, 35, 38, 41-2, 47-8, 70, 127

- e-books 98-102
- emergent theory 22; and course design 156-9
- e-portfolios 3, 17, 28, 73-6, 136-9, 159, 174, 175

- Facebook 77-80
- Flickr 3, 4, 49, 56-7, 77, 84-7
- folksonomy 3, 5, 81, 83, 84, 163

- instant messaging 28, 53, 96, 101-5, 106, 108, 167, 171
- interactivity 44, 54, 63
- intimacy 33-4

- Learning Design 19-20
- learning outcomes 20-1, 31-2, 48, 51, 60, 165, 166
- learning styles 32-3, 58

- mashup 4, 41, 49, 113-7
- millennials 8-9, 44
- mobile learning 117-121, 170
- MySpace 4, 33, 77-80, 148

- online forums 90-5

- podcasting 3, 5, 50, 53, 69-73, 74, 81, 106, 164-6, 170, 171

- reflection 136-9
- RSS feed 3, 10, 18, 80, 121-4, 165, 171

- screencasting 49, 50
- Second Life 87-90, 148, 174
- social bookmarking 80-4; 162-3

- social networking: and assessment 14; and constructivism 17-19, 66; educational uses 1-2, 4, 170; and learning 30-1, 35-6, 48-9, 77-80; limitations 5-7; research on 9-11, 164; skills 8-9
- student-centred learning 15-17, 28-30, 32, 37-8, 42, 60, 173-4
- Skype 28, 35, 53, 89, 105-9
- tag cloud 84
- training 50, 63, 71, 117, 118, 134-5, 142-3, 149-150, 164, 172
- trust 16, 34-5, 63, 164
- user-generated content 4-6, 15-17, 70, 98, 144, 166, 176
- video clips 50, 124-7
- videoconferencing 22, 28, 54-6
- VLE 28, 36, 43, 53, 74, 100, 101, 120, 143, 148-9, 175
- wikipedia 3, 31, 66, 156, 168
- wikis 10, 17, 28, 49, 51-2, 65-9, 121, 156, 160, 170, 171, 175
- YouTube 4, 31, 49, 114, 124-7, 171