

A 'likely benefit' from aligning Web2.0 technologies with an institutional learning and teaching agenda

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Abstract: This paper demonstrates a 'likely benefit', and a practical view of expected challenges, when incorporating Web 2.0 technologies in a contemporary higher education context. After first exploring which factors potentially influence a shift in thinking about learning and teaching in a Web 2.0 context this paper then addresses the important role, or the affordance, of an integrated Learning Management System (LMS) and the pedagogical applications of Web 2.0 technologies. It subsequently uses a series of case studies from the University of Southern Queensland, a large distance education provider in Australia, to support these propositions. Overall, this paper suggests that the goals and ideals of Web 2.0/ Pedagogy 2.0 can be achieved, or at least stimulated, within an institutional LMS environment, as long as the LMS environment is aligned with such ideals.

Introduction

From a higher educational (HE) learning and teaching (L&T) perspective, Web 2.0 technologies, such as social networking sites, blogs, wikis, folksonomies, video, audio and image sharing, offer greater levels of information sharing, interoperability and collaboration, and a variety of opportunities in terms of what such technologies may be used for by a new generation of university students. The challenge for HE providers is to align what students are currently doing with how they are being taught, without blurring the boundaries between 'private' and 'educational' spaces, to the point where students disengage. The ways in which students already use Web 2.0 technologies are, to a great extent, driven by the affordances of the technologies themselves. However, such affordances do not necessarily predict the type of take up on the teaching end of the spectrum. Aligning L&T in ways that suit a Web 2.0 context implies a major shift in thinking about knowledge creation and dissemination, and thus about pedagogy. It requires a conceptual shift from thinking about the Web as a method of communication, to one of education, and thus of knowledge creation and dissemination. While many current Learning Management Systems (LMSs) could be seen as largely text-based and too inflexible to allow for Pedagogy 2.0 (McLoughlin & Lee, 2008), more recently LMSs have been developed that are potentially far better equipped to address the learning needs of students. This ability has been further enhanced by the broad functionality that some LMSs provide to extend their core environments with additional, and in some cases, third party applications.

The advent of Moodle, a learning management system that appears to be well suited to address L&T needs in a Web 2.0 context, is an example of this, and affords the potential to think about the Web as a method of education, as it is essentially based on an open source philosophy of the co-construction of knowledge. However, feedback to date suggests that many university teachers merely use these more progressive environments as a 'traditional' method of communication, or simply as a way to disseminate existing content and resources. This paper will argue that the goals and ideals of Web 2.0 / Pedagogy 2.0 can be achieved, or at least stimulated, within an institutional LMS environment, as long as the LMS environment is aligned with similar progressive goals and ideals. However, this requires universities to resist the temptation to rigidly close the 'wall around the garden', which is a long-established impulse that is difficult to leave behind. This paper will use the implementation of Moodle at the University of Southern Queensland (USQ) as a case study to reinforce this argument and explore which factors potentially influence a shift in thinking about L&T in a Web 2.0 context.

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Web 2.0, Generation V, e-Learning and non-traditional learners

Collectively, Web 2.0 technologies constitute a major shift in the way the Web is used (boyd, 2008). More importantly from an educational perspective, Web 2.0 technologies offer major opportunities for the way in which they *could* be used. This is not to say that the technology inevitably drives these changes, in a technologically-determinist sense, but rather that educators could potentially seize on the ways in which these technologies are already being used and guide this usage into particular directions. In recent years, much has been written about this generation (see Figure 1), which is variously referred to as Generation Y, the Net Generation (Oblinger & Oblinger, 2005), Digital Natives (Prensky, 2001), and Generation V (Havenstein, 2007), and which is generally characterised by having grown up in a technology-saturated environment. Particular sets of characteristics are ascribed to such a generation (Oblinger & Oblinger, 2005), which in turn makes it tempting to call for a complete overhaul of the way we teach such a generation of students, in response to those characteristics. It is not difficult to see parallels between these perceived 'needs' and what a Web 2.0 environment appears to be able to offer. More recently however, more nuanced critiques, based on empirical research, are beginning to appear that throw calls for complete overhauls into doubt (Kennedy et al., 2008), without denying the need to address changing student characteristics particularly those of non-traditional learners.

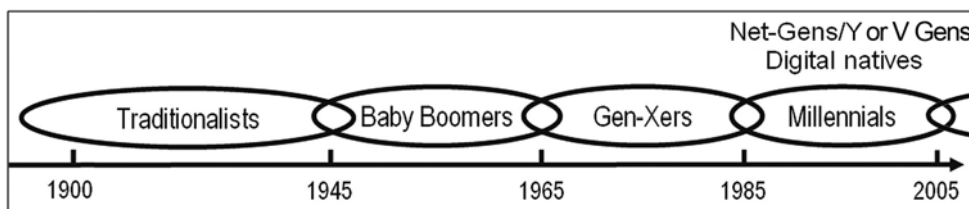


Figure 1. A simplified representation of different generational classifications

Non-traditional learners have grown in prominence and are today a significant consideration when designing L&T environments. For instance in Australia alone international student numbers at universities have doubled in the last 5 years to exceed 200,000 (Barrington, 2004). Schuetze and Slowey (2002) argued that,

Non-traditional students in an elite higher education system were, by definition, a minority. With expansion and change in higher education some non-traditional groups have increased in number arguably to a point where they have come to form a 'new majority' in higher education (p.313).

This has caused a significant blurring of the boundaries in relation to how learning resources have traditionally been supplied as against how they should now be supplied to students (Bridge, 2006). These changes have caused fundamental educational questions to be asked such as 'what to teach and how on earth to teach it' (Jochems, van Merriënboer, & Koper, 2004). For many universities this has required new approaches to the delivery of course content to be considered across the board (Kellner, 2004), and a greater flexibility in the way programs are designed and delivered (Laurillard, 2002). This situation is further highlighted when we consider the issues associated with the learning styles of these students. Whether we like it or not these may not necessarily be the same as what we would normally associate with traditional HE students (traditional learners), at least those who have succeeded at HE and who could comfortably work within a read/write style of L&T (Sarasin, 1999). Barrington (2004) believes this is increasingly becoming an issue because universities (in the West) still privilege certain ways of knowing and focus on a narrow view of the intellect that 'does not always allow for socio-cultural differences' (p. 422). The potential inequity of this situation, particularly for non-traditional learners wishing to fully participate in HE, requires many of these students to have to compensate on a number of fronts. Not only are they trying to understand academic literacies and, in some cases, cultural literacies, but they may also have particular learning styles that would not traditionally be associated with success at a university level. This would suggest, as do Askill-Williams and Lawson (2006), that there is a need to 'represent more fully the diversity and complexity of students' cognitive models about learning' (p. 139) within contemporary university curricula.

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In addition to the increase of non-traditional learners in universities it is also known that many younger students, that may have been considered 'traditional', now approach learning in very different ways. For example, Oblinger and Oblinger (2005) tell us that 'Net Geners' spend so much time online, it seems reasonable to expect that they would have a strong preference for Web-based courses. Paradoxically, 'the reverse is actually true' (p. 2.11) and older students (Matures and Baby Boomers) are much more likely to be satisfied with fully Web-based courses than are traditional-age students. Oblinger and Oblinger also state that,

at the same time that colleges and universities are graduating their first Net Generation learners, most campuses are experiencing an influx of non-traditional students. Three-quarters of all undergraduates are 'non-traditional', according to the National Center for Educational Statistics (p. 2.8).

More recently examples of empirical research are beginning to appear that cut through some common assumptions associated with Gen Y (Kvavik, 2005; Kennedy et al., 2008), assumptions that often identify potential Web 2.0 applications and uses from a theoretical perspective rather than an empirical one (Lesley & Murphy, 2008). While such empirical studies confirm that Gen Y has grown up in an environment 'saturated' by technology, they also suggest that there is much variation with regards to types of use, associated skills, and preferences for use in education. A recent Australian study by Kennedy et al. (2008) shows that 'many first year students are highly tech-savvy. However, when one moves beyond entrenched technologies and tools (e.g. computers, mobile phones, email), the patterns of access and use of a range of other technologies show considerable variation' (p. 108). For example, while Kennedy et al. found a significant growth in students' general use of instant messaging, blogs and podcasting, they also found that the majority of students rarely or never used these technologies for study, and importantly, 'the transfer from a social or entertainment technology to a learning technology is neither automatic nor guaranteed' (p. 119). In terms of educational applications, this has significant implications for rural or regional universities such as the University of Southern Queensland (USQ), with geographically dispersed student populations, many of whom study in distance mode and therefore do not know each other offline.

According to Batson (2008), 'the most significant fact about Web 2.0 for educators is that key functions and intelligence have moved or are moving from the desktop to the Web, and by doing so they have changed' (§ 1). He also stresses the social implications of this movement; 'those functions and intelligence are no longer just about personal productivity, but about the social context for information - what *other* people think about the information' (§ 1). De Byl and Taylor (2007) focus on this social context by referring to a 'Web 2.0 ethos, centering on the idea of a collective intelligence which evolved from hyper-linking, web services, platform-independent software, re-usable and re-mixable content and, above all, user participation' (p. 110). The two central concepts here are collective intelligence and user participation, as these have seriously blurred the boundaries between knowledge management and dissemination. As Batson (2008) states, 'if we accept that all learning is social, Web 2.0 may be more in step with learning reality than the book or the PC' (§ 2). Clearly, the development of a Web 2.0 ethos is driven by the affordances of the technologies themselves. Whether it is a wiki, blog, or a photo sharing site like *Flickr*, the ways in which these are structured invite certain uses, which are usually social in nature. However, once the technologies are there, the extent and ways in which they will be used are firstly not always predictable, and secondly not always desirable from a pedagogical point of view. In other words, it is important to resist the temptation to blindly follow what Generation V (Havenstein, 2007) does, under the guise of 'student-centeredness', without carefully considering what members of this generation (and others!) *should* be able to do upon completion of a university degree.

Overall then, the onus is on universities to clearly define coherent strategies to align the already existent skills of Gen Y with learning objectives and outcomes based on providing tools for meaningful knowledge creation and dissemination suited to a Web 2.0 context (Alexander, 2008). The authors of the 2008 Horizon Report note that Web 2.0 technologies allow for the creation of 'collective knowledge stores', where the 'data are not organized in the traditional sense, and indeed it is in part the unstructured nature of collective intelligence which allows it to be created and mined in ways that often lead to multiple levels of new insights' (p. 23). Similarly, Unsworth (2008) argues that what universities should recognize in the emergence of Web 2.0 is 'a shift in emphasis from the computer as platform to the network as platform, from hardware to data, from the wisdom of the expert to the wisdom of crowds, and from fixity to remixability' (p. 227). Of course, there is a sense of inevitability in descriptions like these, and a lack of recognition that this is essentially contested territory. The challenge to come out of this for universities is twofold: on the one hand it requires

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universities to address the question of access, and on the other it calls for strategies to teach students to engage with these new insights in meaningful ways.

McLoughlin and Lee (2008) define such principles under the header Pedagogy 2.0, which they define as follows: 'Pedagogy 2.0 integrates Web 2.0 tools that support knowledge sharing, peer-to-peer networking, and access to a global audience with socioconstructivist learning approaches to facilitate greater learning autonomy, agency and personalisation' (§ 2). Importantly, they also identify the main challenge as enabling 'self-direction, knowledge building, and learner control by offering flexible options for students to engage in learning that is authentic and relevant to their needs and to those of the networked society while still providing necessary structure and scaffolding' (§ 7). It is the latter that presents the greatest challenge, and goes to the heart of our discussion in this paper, because it forces the spotlight onto a potential contradiction between 'open' (Web 2.0) and 'walled' ('managed') learning systems. In short, it creates unease, as it requires a major shift in the way universities think about the role of the teacher, and indeed about the level of teacher control over learning. This in turn has a ripple effect through every pore of traditional university structures, according to which the teacher assesses, judges and evaluates, and thus 'controls', student learning outcomes. Ultimately, this is a fundamental way in which universities build and maintain their reputations. As Geith (2008) notes, 'measuring, valuing, and recognizing learner performance remains an exclusive function inside formal education systems' (p. 224). Pedagogy 2.0, by contrast, increases 'the level of collaboration with experts and peer groups and [connects] students to an emerging global network or architecture of participation that transcends the walls of the institution' (McLoughlin & Lee, 2008, § 13). The role of teachers or instructors in this context becomes one of working 'collaboratively with learners to review, edit, and apply quality assurance mechanisms to student work while also drawing on input from the wider community outside the classroom or institution' (§ 14). To do this successfully requires a series of adjustments within institutions that historically are slow at adapting to major change (Henshaw, 2008).

The required changes relate to institution level changes, as well as to the ways individual teachers conceptualize their function, and ultimately the ways in which they approach knowledge creation and dissemination. To begin with the latter, Geith (2008) identifies the emergence, in a Web 2.0 context, of an abundance of 'credentialing options focused on the performance of the learner outside the walls of formal education' (p. 225). This in turn leads to a context where 'learners' and 'teachers' are 'freed from constraints imposed by a scarcity of expertise and a scarcity of learning resources' (p. 225). Again, to accept this in principle, as a university teacher, requires a level of comfort with relinquishing control that is likely to take a significant amount of time to develop for a large percentage of those teachers, as it upsets their perceived *raison d'être* in fundamental ways. Furthermore, to negotiate the levels of 'outside' and 'inside' expertise, and integrate these in flexible ways in their teaching requires an understanding of the Web 2.0 environment, an ongoing updating of knowledge, and a degree of immersion in such environments. This may well challenge an ageing university workforce of 'digital immigrants'. For example, Mabrito and Medley (2008) note that 'while N-Gens interact with the world through multimedia, online social networking, and routine multitasking, their professors tend to approach learning linearly, one task at a time, and as an individual activity that is centered largely around printed text' (§ 4). To prepare teachers for Pedagogy 2.0 would therefore require 'a tremendous amount of institutional support' (§ 16). Furthermore, it would require a flexible 'whole-of-institution' approach, where universities are traditionally monolithic systems that in practice tend to be 'less flexible and ultimately less innovative than the granular and remixable information services now often called Web 2.0' (Unsworth, 2008, p. 229).

There are already many instances of individual teachers taking advantage of the increasing availability of 'ubiquitous, free, and efficient online collaboration tools for teaching and learning' (Hargis & Wilcox, 2008), for example through innovative uses of blogs (Bruns & Jacobs, 2006) or by incorporating Web 2.0 environments like *Wikiversity* (Friesen & Hopkins, 2008), social network sites (boyd, 2008) or *Second Life* (Kelton, 2007), among others. The emphasis, in these instances, is on the openness of such tools and environments, which contrasts sharply with virtual learning environments consisting solely of students and their teacher that may not take advantage of network effects (Alexander, 2008), and thereby risk becoming irrelevant. However, as noted above, empirical evidence is beginning to suggest that the role of the teacher, armed with sound pedagogical principles, is vital in such environments for learning to occur. For example, in their study of blogging for instructional purposes, Leslie and Murphy (2008) found that students did not move beyond low level information sharing, nor engaged in knowledge construction, which they attributed to a lack of teacher presence. In short, what students lacked in this context was what teachers traditionally offer: the design of the educational experience; the facilitation of that experience; and subject matter expertise (§ 37).

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What this again suggests is a need for a LMS that is characterized by openness, but at the same time provides a consistent environment and adequate institutional support for professional development of teachers to allow them to take full advantage of the possibilities for sound pedagogy that Web 2.0 applications offer. At USQ the Moodle LMS has recently been implemented, based on the expectation that it will deliver an environment that will allow teachers to take advantage of Web 2.0 tools, while maintaining a level of control and 'scaffolded safety' in which to learn how to take full advantage of such an environment.

'Safe' versus 'open' virtual learning spaces: pedagogical and institutional implications

The main concern with the 'open' approach described above is that students, in having to cope with new or different ways of doing things, may be required to use additional and possibly unnecessary cognitive load, as opposed to using this capacity to focus on the actual learning that is required (Dror, 2008). This concern relates primarily to the ontology of Web 2.0 technologies and social software that is based on the idea of small pieces (fragments), 'loosely connected utilizing commonly recognized standards and web services for linking ideas, knowledge and artifacts' (Attwell, 2007, p.5). This may not be a problem for competent students, but for those students who may be considered 'on the edge' (usually non-traditional), this strategy can increase the amount of mental stress associated with study (Kalyuga, 2007). Shadbolt et al. (2004) reinforce this when they suggest that in taking this temporal (open) approach, 'there is a higher cognitive load on the user to remember the relevant previous information' (p.46). Thus, this raises a question of whether this load should be scaffolded instead, which would imply a less 'open' environment, at least initially.

The 'open' approach may be sustainable where it is employed occasionally and when the context is appropriate, but once it is adopted more widely or for novelty (as 'something different') serious planning across the program is advised. However, if such an 'open' approach can be used in conjunction with, or mediated by, an LMS such as Moodle and/or a personal learning environment (PLE), it has the potential to provide a coordinated suite of information allowing users to focus their energies on knowledge building, 'rather than on splitting their attention, and hence increasing cognitive load, between remembering which instance was next to another while focusing on the detail of a current selection' (Shadbolt et al., 2004, p. 46). Dror (2008) states that by adopting this approach, 'one can considerably reduce cognitive load by tailoring the learning to the architecture of cognition' (p. 218).

Overall, Dron & Bhattacharya (2007) suggest the following ten considerations when attempting to go outside the LMS. Each of these are presented here from a USQ contextualized perspective, and they include both pedagogical and institutional considerations:

1. *Technical problems*

These manifest themselves in a number of ways: from a users' perspective this may include accessing environments that use voice and/or video applications requiring plug-ins and download capabilities greater than some students have access to. Most universities have adequate computing standards to which staff are expected to adhere, but once outside the university's systems there is little or no control over this. From the university's perspective, security issues can also arise from staff (and students) accessing sites that use protocols unacceptable to the infrastructure, particularly when these are accessed from within the university's systems. This has led USQ to develop a series of 'minimum standards' for the delivery of electronic course materials and a range of alternative delivery options for those who have access problems, or in fact no internet access at all. For example all materials are now developed as HTML with printable PDF versions, via a single authoring process, for either online or, if need be, CD based delivery.

2. *Clashing cultures*

As traditional hierarchies or 'more traditional' ways of teaching exist in many courses/subjects, tensions can arise if a 'whole of program approach' is not adopted for the use of new technologies, or ways of doing things. Particularly at USQ, with its strong distance education focus, staff may come to the university who have taught in very different contexts (face-to-face mode). This may lead to students becoming dissatisfied with staff and staff being frustrated with fellow staff pushing the boundaries in isolation. In other words, consultation to overcome the issue of isolated pockets of innovation is recommended for those wishing to extend their discipline in new directions. Therefore moving to a common web friendly platform for the production of teaching resources is one way in which USQ has attempted to minimize this issue.

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3. ***Technophobia***

Technophobia looms large for both students and staff, as part of a natural resistance to change. In some extreme cases, staff do not even use online discussion forums for their students, which is problematic in USQ's institutional context where some 78% of students may never physically be on campus. In addition, a very high proportion of non-traditional students, many of whom come back to study after extended periods of time, means that adopting too many 'new ways of doing things' too quickly (particularly with Web 2.0 technologies) can be off-putting. However, if these tools can be integrated within 'the walled garden' then some monitoring and support can be provided for those who may be struggling.

4. ***Loss of monitoring***

In many cases the use of Web 2.0 technologies bypasses traditional ways of teaching, with students operating outside the gaze of the teacher. This is not dissimilar to students gathering in a café to talk about their work. However, in the context of USQ, where so many students study at a distance, this becomes more problematic. Nevertheless, if these tools are being used as part of assessment and they are housed within the public domain there can be no effective monitoring of when, or by whom, these sites are accessed. This may be addressed within the design of the course by limiting the dependence on this aspect for assessment, but that would then limit the uses of assessment for pedagogical purposes.

5. ***Loss of control***

In a similar vein to lack of monitoring, when utilizing Web 2.0 tools outside the university's domain there is no assurance for staff or students that those tools will endure, even for the life of a course/subject. This may result in the loss of important data and can potentially affect student outcomes. If Web 2.0 type tools can be employed within the university environment then there is at least a reasonable compromise and will be demonstrated in the USQ case studies below. This point also very much relates to the following point of preserving some form of history, not just for the universities sake but also for the student ongoing benefit.

6. ***Loss of history***

The main benefit for both staff and students in using an LMS, such as Moodle, to house Web 2.0 applications is that there is always a record of practice that can be called upon if needed. In most cases systems are backed up daily and do not run the risk of outsiders corrupting important data. This may not be important for some staff members, but in Australia there are also legislative responsibilities that universities are required to adhere to, which mandate that the learning environments students are exposed to must be maintained for a minimum period of two years after they have completed a course/subject of study.

7. ***Assessment woes***

This relates to the loss of history and the ability of staff to assess the veracity of work presented by a student for assessment. This is not to suggest these problems do not also exist within 'the wall', but there is at least a track of who has been to the site. This also offers the student a level of security as they can, in most cases, track their submissions. USQ's introduction of PLEs allows for the syndication of external sources, and attempts to bridge this divide providing at least a level of monitoring based on a common student disclaimer of source materials. What needs to be considered is how best to design assessment to minimize identity fraud whilst taking full advantage of the affordances offered by syndicated Web 2.0 tools.

8. ***Overwhelming choice***

There are so many choices now in the vast wilderness of the Web that it is impractical for teaching staff at USQ to be conversant with, or have accounts with, all the possible environments that could be used for L&T. At a simple level *Wikipedia* (2009) alone lists in excess of 130 potential social networking sites, while other environments list many more. Potentially, one teacher uses *Facebook*, another uses *MySpace*, while yet another wants to use the university's approach to PLEs. As previously mentioned, the potential of additional cognitive load for students (and staff) when so much choice is offered can indeed be overwhelming. If the teacher is to be 'a guide' leading students through a process of learning, universities need to support this by empowering their staff to become more familiar with the diversity of new and emerging landscapes. However, the cost of such an approach certainly challenges the will of some department heads, even if their resistance runs the risk of becoming increasingly irrelevant to students. Therefore, if the university can provide (or allow

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syndication with) a select number of environments that offer Web 2.0 features, the potential to reduce confusion and misinformation is greatly reduced.

9. ***Loss of trust***

Trust is a two-way street; both students and staff not only need to be able to trust each other, but also the environments in which they work. If Web 2.0 tools can be mediated through a student's PLE, or even housed within the LMS, student and staff need to have a level of trust in the veracity of the content being supplied (as discussed above). There is also the sense that the teacher, or university, can monitor the space, thereby protecting students (and staff) from misuse, the threat of hackers and the unreliability of transient spaces.

10. ***Inequalities***

With the large diversity of experience within the USQ's non-traditional student base, it can be considered inequitable to subject these students to a wide variety of Web 2.0 tools that may simply be used, or trialed, for their novelty value. Solid pedagogical advantage should be discernable prior to particular tools being used. Again, this is not to suggest that these spaces should not be used, but rather that a Pedagogy 2.0 approach is preferred if they are to be used, which would include sufficient scaffolding to prevent the advantaging of one set of prior skills, or understanding, over another.

Having highlighted the main considerations in using Web 2.0 technologies, as highlighted by Dron & Bhattacharya (2007), this paper will now provide some examples of how these new technologies can be used effectively in L&T programs, both within and outside of 'the wall'.

The affordances of Web 2.0 technologies have allowed the more traditional (face-to-face) universities to embrace the notion of flexibility in the way they provide their opportunities for learning, which was previously the domain of institutions that focused more on distance and eLearning. On the other hand, institutions that have had a high dependence on providing individualized distance and online learning experiences increasingly need to supplement their materials, to address the changing needs of their increasingly diverse student cohorts. The potentially limitless choice of technologies and approaches for learners and teachers requires great adaptability to changing circumstances and learning needs. Again, some caution is required here, as certain hyperbolic assumptions have justifiably led to reflective statements like these: 'today's digital learner' presumably belongs to Generation Y, but the 'movements' of this generation in the 'digital world' are highly varied and not necessarily fluid (Kennedy et al., 2008). In other words, what about those who move 'less fluidly' or do not move in the digital world at all? In short, despite the exciting opportunities that Web 2.0 tools offer, it is vital to carefully consider the wide range of student abilities and needs at every step of the implementation stage. For USQ the need for more meaningful interaction between staff and students and between students has spawned an emerging dependence on a range of Web 2.0 tools embedded within the LMS and PLE environments, such as:

- Virtual classroom technology
- Synchronous and asynchronous voice and chat applications
- 3D virtual worlds
- ePortfolios and PLEs
- Blog and Wiki spaces allowing for collaboration and reflection

Brief examples of how these tools are currently being used at USQ are described below. It should be noted that USQ has employed a range of tools in conjunction with its installations of Moodle and the Mahara ePortfolio software. The Moodle software has been employed at multiple levels: there is an installation for the student LMS; there is a separate environment for staff professional development that is also used as a playground for trialing new and emerging tools; there is a further installation for community activities engaging institutions and identities outside of the university's walls; and finally an OpenCourseWare installation, housing courses offered through the International OpenCourseWare Consortium emanating from MIT.

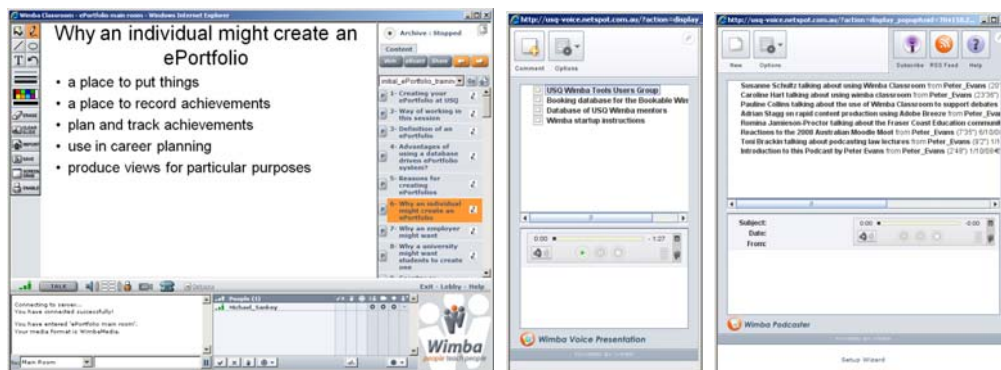
Virtual classroom technology

The implementation of a campus wide approach to virtual classrooms (VCs) in 2008, using the Wimba Collaboration Suit, has allowed this technology to be embedded in the Moodle LMS. This has facilitated the establishment of and contextual use of the VC at both a course/subject level and a university community level. The VC allows for the synchronous sharing of voice, video, presentations

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and application sharing, allowing these sessions to be either instructor or student led. Over the course of 2008 VCs were used in over 61 courses/subjects to host live interactive sessions, both in staff-to-students interactions and student-to-student interactions. Once a VC is established within a course anybody enrolled in that course can access this room at any time. Archives may be made of sessions to allow for recording of particular interactions for asynchronous use. This technology feels 'natural' to Net Gen students and is intuitive enough to cope with for novices, and it has allowed many students, particularly distance students, to establish new networks previously unattainable.

As previously discussed, usability issues have been a concern, particularly for USQ with its high proportion of non-traditional learners. For students unable to interact in the online sessions due to bandwidth constraints, each VC can be accessed by telephone link for the cost of a local call. Initially it was not clear how many students would require this functionality; however, within the first 10 months of use this feature was used in excess of 500 times.



Figures 2. Wimba collaboration suit virtual classroom, voice board and podcast tool.

Synchronous and asynchronous voice and chat applications

The use of voice and chat applications has been developing for many years at USQ. In previous years tools such as *MSN Messenger* and *Skype* have been used in an adhoc way. However, the implementation of Moodle has allowed the course/subject and community based embedding of voice and text-based chat applications. The tools used are the Wimba voice boards, allowing asynchronous voice and text messaging and the Wimba Pronto tool allowing synchronous chat with similar functionality to *MSN Messenger*. These two tools were not implemented until Semester 2, 2008 and are increasingly being adopted into courses with over 1700 sessions being recorded prior to the end of 2008. The Moodle LMS also allows for asynchronous chat within the individual student profile.

3D virtual worlds

The proliferation of 3D games environments, particularly over the last three to four years, has opened up new possibilities for creating immersive multi-user learning environments, even if this is problematic for the university from a security perspective. However, the security issue has mostly been resolved by employing and integrating two 3D environments simultaneously, *Second Life (2Life)* and the open source product *Open Simulator (OpenSim)*. There were occasions where it was considered important for students to be in a wider and more open environment than 2Life can offer, while on other occasions it was necessary to ensure more privacy than 2Life could offer, or a more secure space for students to interact. This more secure space was achieved by deploying the OpenSim environment 'within the walls' but using the interoperability features within that product to take students out to 2Life when required, and vice versa.

For example, USQ currently has an island in the 2Life environment called *Terra Incognita*, hosting a range of different activities, including marketing and promotional activities for the university, a careers fair, teaching areas (Figure 3), break out rooms, a mock law court for hosting moot courts and a number of social spaces. The only concern with this has been that anyone who can access the USQ island can drop in at any time and observe what may be considered as private. On the other hand, OpenSim embedded in the USQ environment allows for the creation of more discreet spaces. For the most part this has alleviated many of the

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security concerns, while also providing a controllable level of interoperability with 2Life. In practice this means that a 3D course can be set up within 'the wall', which then allows teaching staff to send students out and potentially bring information back in.

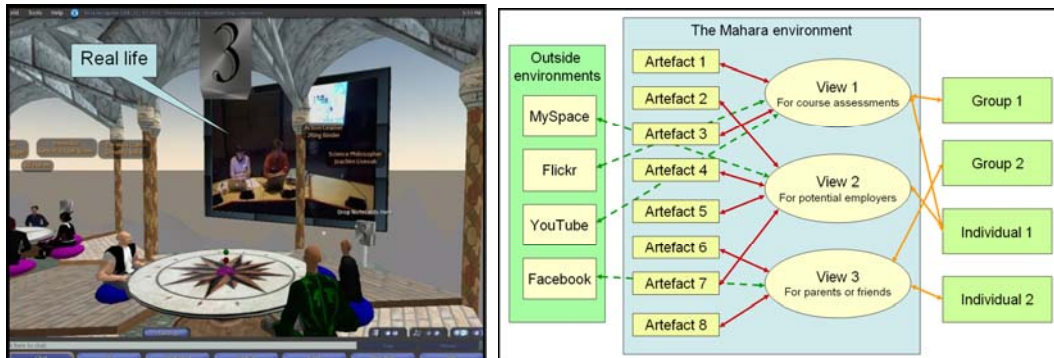


Figure 3 & 4. A USQ 2Life room with live video conferencing (left) and a USQ PLE using Mahara (right)

ePortfolios and PLEs

The move towards ePortfolios for both students and staff has taken an interesting turn at USQ in recent times. The adoption of the open source Mahara software has opened up a range of new vistas for teaching staff. The Mahara software and the integration of this software with the Moodle LMS has allowed the university to provide not just a space for students to create a profile for themselves with some additional features, but also an environment for them which is akin to a Personal Learning Environment (PLE). The Mahara environment allows for the creation of multiple views that students can set up for a range of purposes (Figure 4). They can create and upload documents, house a blog, draw in content from external spaces and make a variety of these available for different people to see, and in some cases interact with.

For example Education students are using their PLEs to house records of their professional practice while also using them to complete assignments for another course. Final year accounting students are building up their PLEs with a portfolio of their work-integrated learning practice. Visual Arts and multimedia students are using their PLEs as a stage from which to link to a range of other environments housing video and audio components while uploading others. These elements then all appear within one or multiple views. Staff undertaking professional development activities are using the PLEs to house and manage artifacts that they can then use towards promotion, while also linking to the university's ePrints repository that feeds all their publications into this same environment. And all of this is only just scratching the surface of what can be potentially done with PLEs due to the affordances of Web 2.0 technologies.

Blog and Wiki spaces allowing for collaboration and reflection

The final example relates to a series of four work-integrated journalism professional development courses housed in the Faculty of Arts at USQ. The courses use a combination of interactive tools integrated into the Moodle LMS. A program website manages how students should negotiate the learning environments and interactive tools, providing information pertinent to the whole program. This site then provides links to the four online multimodal course materials sites, using USQs Integrated Content Environment (ICE) with integrated multimedia enhancements, and links to each course's blog, wiki, and discussion forum spaces. The use of blogs in assessment enables students to complete story writing assignments as part of their daily work at the newspaper and, as with the feature assignments for the standard university course, submit the stories as coursework, and engage in critical evaluation of the practices they applied in story composition. Elements such as a Newsroom Diary, a Research Record and Reflective Posts on self-selected stories, a Court Experience Journal, and a Story Mission Statement, are built into an electronic portfolio-based assessment model.

A 'likely benefit' from aligning Web2.0 technologies with an institutional learning and teaching agenda

Conclusion

As the examples above suggest, the introduction of Web 2.0 technologies into the online L&T environment at USQ is characterized by a staggered whole-of-institution approach, and deliberately so. This staggered approach is based on the recognition that while the introduction of Web 2.0 technologies in a HE context has many potential benefits, such benefits are at the same time largely unproven and still highly contested. There are for example issues of privacy and ownership of data to consider, as well as ethical issues related to inadequate evaluation of implementation (Chowkat et al., 2008). The staggered approach is thus designed to allow time to work through some of those issues, without putting innovation on hold in the meantime. While the uptake is initially driven by early adopters, the ultimate objective is for staff and students to engage with a Web 2.0 environment and its ever-expanding array of tools, and all the advantages that this would afford. The advantages are roughly two-fold: firstly, in a professional context most students will need to be at least comfortable in a Web 2.0 environment upon graduation, and have the ability to quickly adapt to changing circumstances and opportunities in this environment. Secondly, moving academic teaching staff towards adopting Pedagogy 2.0 is expected to instill a lifelong learning ethos, and thus the ability to consistently take advantage of the potential of new technologies, whilst stimulating continuous reflection on pedagogical practices. Both the staggered and whole-of-institution aspects of the approach are designed to provide adequate support and professional development opportunities on the one hand, and also to provide a safeguard against ad hoc and inconsistent practices across different faculties and even within different faculties. In this way, the approach is designed to provide a 'likely benefit' to both student and staff.

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