WORKING OUTSIDE OF THE SYSTEM

Engaging in Web 2.0 to enhance learning and teaching in the design studio

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Abstract. The Deakin Studies Online (DSO) Learning Management System (LMS) forms the fundamental basis for tertiary education at Deakin University. This LMS is founded on Web 1.0 principles, however significant potential exists for engagement in Web 2.0 technologies to support learning and teaching in the design studio. A digitally enhanced design curriculum is discussed starting with html-based reflective folios in 2001, the use of blogs for reflection and resource creation and culminating in a Web 2.0 design studio based on social networking.

Keywords. Learning management systems, blogs, Web 2.0, learning and teaching, design education

1. The university LMS and Web 2.0

Deakin University has been recognised since its inception for its engagement in off-campus education. Throughout its five campuses in three different cities in metropolitan and regional Victoria, 'the use of distance education methodologies and materials for both on-campus and off-campus cohorts 'gathered momentum in the early to mid 1990's under the strategic umbrella of flexible teaching and learning' (Palmer and Holt, 1997). Since 2004, Deakin University has sought to further the 'technological imperative' (Holt and Thompson, 1995) through the initiative of Deakin Studies Online (DSO). DSO was introduced to the university in 2004 using Web CT learning management system (LMS) software, which was upgraded to the Blackboard Vista platform. This university-wide initiative represents a multi-million dollar investment in IT-enhanced education for both on-campus and off-campus tertiary education.

University operational policy dictates that all units throughout the university must have 'an online site' in DSO, which includes a minimum of unit guide, discussion 'chat' forum, faculty notice board and student–staff communication expectations. Basic engagement can be extended to the level of 'wholly online' units, with university policy dictating that all students in all courses must complete a wholly online course before graduation.

A wide array of online learning and teaching initiatives exist across the university. DSO forms the core LMS for these activities, however educators often work outside the system in order to achieve educational innovations. Deakin educators have engaged in Web 2.0 technologies across a wide variety of educational situations, including the use of Wiki's (Augur, Raitman and Zhou, 2004), social software (Goold, Augar and Goodman, 2008) and Second Life (Warren et al., 2008). Many educators working outside of the core system of DSO have been recognised for their contribution to learning and teaching through university-based and national awards.

DSO is an example of a LMS based on pre-Web 2.0 philosophies, which limit 'interactive information sharing, interoperability (and) user_centred design' (http://en.wikipedia.org/wiki/Web_2.0). The university must balance the needs of controlling large amounts of course materials, managing digital resources and tracking assignment submissions with enhancing courses through user interaction. A blended learning approach must balance the potentials of Web 2.0 with control of information required in the university LMS environment.

2. Pre-Web 2.0 digital design initiatives

The www.ab.deakin.edu.au/online site (known as a+b/online), set up in 2001, acts as the host for digital design initiatives at the School of Architecture and Building at Deakin University. This website operates independently of DSO and is used for peer learning, retention, online folios and benchmarking of work from year to year. It contains exemplars of many digital design initiatives, including reflective 'Games' (Woodbury et al., 2001) an online virtual gallery (Ham and Dawson, 2004; Ham, 2008) and online case studies (Ham, 2002).

Web 1.0 digital design education often placed a serious overhead on staff and student workloads. Students enrolled in digitally-enhanced units in design and technology were required to learn Dreamweaver to create web pages for digital project submissions, or to rely on the limited html publishing capabilities PowerPoint. This placed a time overhead above the required learning outcomes for each project – a critical issue for time-poor students.

Independent evaluation commissioned by the Institute of Teaching and Learning of a second year unit in building construction in 2003 highlighted this issue. A number of students were resentful at the additional burden placed on them and, at the time, could not see the benefits of learning web design and the extra work required just in order to achieve some form of digital output (Challis, 2003). At this time, even learning PowerPoint was perceived as a burden on some digitally challenged students.

'Digital reflective folios' worth 10% of unit marks were introduced in 2001 to engage students in digital media and facilitate the retention of student work online. Digital reflective folios differ from a simple digital translation of traditional physical folios through the inclusion of a requirement for students to engage in reflective activity. Folios were posted on the school's online virtual gallery as a lasting record of student involvement in the unit. Although the outcome of the digital reflective folios provided valuable insights for educators and may have contributed to students learning cycle, there were evident limitations of this method. Principal of these was the submission of folios at the end of semester, which may have limited the quality of reflective comments due to the time delay between the design activity and the reflection.

The subsequent engagement in Web 2.0 technologies changed the very nature of the digital design education approach by reducing these overheads, enabling greater functionality and interaction capabilities between students and staff. Online weblogs, YouTube-based design projects posted to virtual galleries that enable international feedback and social networking have been used together or alone since 2005 in various units in design and technology. The unique attributes of these technologies enable different opportunities to enhance design education.

3. Web 2.0 digital design education initiatives

3.1. REFLECTIVE BLOGGING IN DESIGN EDUCATION

Online blogs have been employed since 2006 in second, third and fourth year design studios with enrolments of 90–120 students. Blogs have also been used in a core unit in construction technology for the development of shared learning resources. Blogs are hosted at www.blogger.com and included in the a+b/ online virtual gallery (www.ab.deakin.edu.au /abGallery/blogs.php). From the university's database-procured spreadsheet of student information, students were assigned a unique blog address, linked to an online gallery created from exporting the spreadsheet to .html. Formatting of the blog link was strictly templated to unitcode_studentid.blogspot.com to enable immediate linkage to the blog virtual gallery.

Integral to engagement in reflective blogging is the delivery of a lecture on Donald Schön's research on reflective practice (see Schön, 1983), outlining the various modes of reflective activity and their importance to the development of mature designers. The intention was to involving students in learning theory, as a part of learning how to become a mature practitioner.

Students uploaded formative images of their designs and provided reflective comments on at least a weekly basis (see figure 1, below). They were asked to become actively involved in the blogging community by providing quality reflections and participating in peer-to-peer feedback and discussion in addition to meeting the minimum requirements for assessment.

The level of engagement and quality of blogging varied widely according to students' learning modes and strategies. Deep learners would be expected to conceptualise approaches, seek interconnections between concepts and data, and engage in reflective activity (Saljo, 1979). Shallow learners however, would be expected to treat the task as an external imposition, focus on discrete elements without integration and be unreflective about purpose or strategies (Norton, 1999), whilst adopting lower-order cognitive skills and completing

Figure 1. Example of student blog post.

of tasks with minimum effort (Biggs, 1999, p. 1318).

Reflection in blogs varied from a case of a single post that simply para-phrased the unit guide. This student obviously strategically adopted a strategy of losing 10% of unit marks to concentrate on the design projects worth 90% of unit marks. In contrast, some students made daily commentary outlining the full details of their feelings and emotions during design activity, responses from reviews, self and peer critique. Comments on the blogs also reflected unease in engagement in blogging, and an awareness of the time the blog may take away from what they may perceive as core design activity. Students were mindful that the blog constituted 10% of unit marks, and that the lecturer was reading their comments:

> this is my first time setting up a weblog … need to explore more as it would be 10% for my design unit.

Comparisons between first posts and last posts provide some interesting insights. One student started the semester with trepidation:

> Welcome all, a forum for our thoughts is a challenging concept, putting into concise words what is rattling around in ones head can be quite unnerving… So generating these 'high-quality' thoughts and 'reflec-tions' to accompany our striking architecture should be an interesting journey for all involved.

And by the semester's end, the same student must have realised the ben-efits of reflective blogging as a learning tool:

> So this will be the last post for the unit requirements, but possibly not the last post on the blog. The blog has been a lot of fun and I like it as a tool expression and putting my ideas and work out there so I think that I might continue blogging away for the rest of my life as an architecture student.

Most engaged in the blogs in a non-reflective manner, effectively using the blogs as a weekly report of progress. Students appear to have great difficulty engaging in reflective activity, particularly when reflections are published online. A typical factual, non-reflective post is as follows:

> I have integrated a small piazza to the rooftop. This level of the building already has medium sized lecture theatre, to large student studios, male and female toilets, access to first level cafeteria and student lounge.

Reflective blogs differ from the traditional folio and digital reflective folios in that they enable students to form 'reflective communities' by engaging in conversation, commentary, debate, collegial assistance and team building through the blogs. Amid the 'noise' of conversation in student-to-student blog

comments, some valuable insights were gained into the depth of thought being put into the project. In some cases, students engaged in extended debates over several weeks on issues of architectural theory and philosophy. Several groups of students also took the initiative to set up their own blog sites to facilitate their own group interaction, resource sharing and knowledge transfer during group design projects.

Another key element of reflective blogging in the design studio is the role of the lecturer in extending engagement with students into online space. Reflective blogging allows, at the lecturer's discretion and time availability, an interface with the students outside of the physical studio. Unit budgets currently limit students to only around 6 minutes of direct tutor contact per week. Considerable value can be added to design studio teaching through the lecturer's own blog and regular online engagement with students through blogs.

Blogs have been used to further the programme of resource creation on the online virtual gallery site in units in construction technology. By using blogs as an information repository for posting the outcome of student job site visits and research on building construction, a vast potential exists for the creation of shared resources for peer learning. This approach references the Construction Primer (Burry and Smithers, 1997) as an excellent example of Web 1.0 student authored construction technology resources, wherein student work is given value beyond just for assessment.

The blog, as a user-controlled interface between the construction site and the academy, is ideally suited to capturing information related to 'real world' construction technology. Construction research blogs contain images of projects under construction, written descriptions and student-authored simulations of construction processes using CAD models, drawings and images. Linkage to product supplier websites and databases are included in blogs as a reference.

In 2009, the use of blogs in construction technology units was enhanced through the introduction of student-created videos uploaded to a university server. This added considerable value to the construction technology resources created by students by adding the ability to video interview builders and architects and record construction processes. Copyright policies preclude the posting of these videos to YouTube, however remain on the school server for 'in-house' reference.

A number of challenges exist with this method of blogging as resource-creation. Access to commercial building sites is restricted in Australia to 'red card' holder – those who have completed safety and induction programmes. Builders are traditionally open to assisting students, but wary of releasing information to students that will become available to competitors online.

Assessment presents further challenges for educators using blogs in design education. Assessment criteria need to be clearly stated in the unit guide to reflect the need for both regularity of blog posts and quality of reflections. Although blogs allow the creation of web content without web-authoring skills, the basic principles of web design still apply. Unit evaluation has revealed some cases where student felt that parts of their blogs were left unassessed. Issues of poor blog structures are compounded by limited time allocations to explore blog sites to their full depth. A formative assessment model appears the best way to overcome the issue of dealing with the large amount of information and reflections on blogs. Summative assessment results in a large amount of marking at the end of semester, which increases the potential for missing relevant information for assessment.

Copyright remains an issue of concern. Many students posted images of architectural works from around the world in their reflections on inspirations for their designs. Quite often, these images were downloaded from an online source and included in blogs without any plagiaristic intentions, but simply to illustrate an idea. A strict reading of the university copyright policy would disallow this activity. Re-mixing of information, the 'mashing up the media landscape of the 20th century and shattering the wall between users and producers' (http://films.nfb.ca/rip-a-remix-manifesto/) however seems the norm in the Web 2.0 community.

3.2. A WEB 2.0 DESIGN STUDIO

In 2009 the use of Web 2.0 in the design studio was expanded for a third year design studio using the social networking site Ning.com (see http://deakin2009.ning.com/). This site enabled the development of a social network dedicated to the design studio, allowing high quality student to student, and student to staff interactions.

The Web 2.0 design studio comprised two projects: a four week project designing a Future House for 2050 and a seven-week design project based on the design of a pencil tower in Hong Kong. Each project utilised different attributes of Web 2.0 technologies within a blended learning environment.

The Future House 2050 project required students to design a contemporary house that is "loose fit", adaptable to the needs of the "typical" family of the 2050's and sustainable in energy usage, and low-impact material. Students were required to present their design in the form of an eight to ten minute video, posted to YouTube.com.

Formal submission for the project was in the form of an email to the unit chair containing the direct link and embed code for the video. The embed code was pasted into a html-based online virtual gallery with links to these videos

alongside a "mail to" link to enable students to receive emailed feedback (see figure 2). Links to the virtual gallery were emailed out to networks of academics and practitioners around the world, who viewed videos and provide feedback via email, with a copy sent to the unit chair for consideration in assessment.
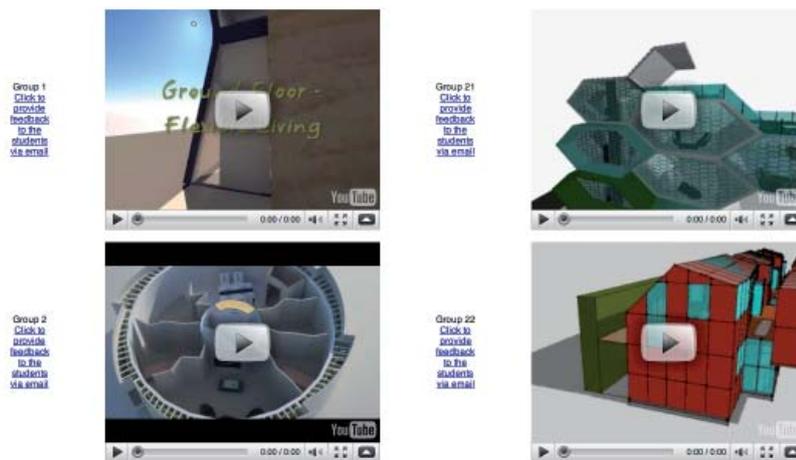

Figure 2. Future House 2050 virtual gallery.

The design of this project intended to provide students with an alternative to the traditional paper-based poster and review format of assessment. YouTube based submission challenged students to express their design in video format, allowing their designs to be viewed worldwide whilst receiving the benefit of emailed feedback from America, Hong Kong and Europe.

The second design project in the studio sought to further the engagement in Web 2.0 to enhance learning and teaching in the design studio. The location of the design project in Hong Kong was ideal for a social networked design studio and posed multiple challenges to Australian students. Ning.com served as an information repository for student-authored research on the site, Hong Kong culture, climate and building regulations.

Peer-to-peer feedback was enabled through students posting images of drawings, CAD models and physical models in development. Additional feedback outside of studio class time was enabled through the site with students posting images and messaging unit staff with specific questions. As the project was partly undertaken in groups of three, some students set up their own social network to facilitate teamwork. This served to facilitate teamwork interaction within a context where some students live 60 kilometers from their team members.

A key to the outcome of the project was the participation of Hong Kong-based colleagues Marc Aurel Schnabel and Christiane Herr, who volunteered their time for the project. Both acted as virtual studio staff for the project, providing valuable assistance to students through ning.com and participating in a series of Skype-based lectures. Although the project was presented in the form of traditional posters and models, international input was facilitated by the presence of Skype-based reviewers in Hong Kong.

This web 2.0 design studio resulted in several thousand online interactions. In the last month of semester, the www.deakin2009.ning.com website reported 3,928 visits, with between 74 and 229 site visits per day by members culminating in 36,945 page views. Unit evaluation revealed 76.6% agreement with the statement that 'the on-line teaching and resources in this unit enhanced my learning experience', a 13.2% increase for the same studio in 2008 using DSO and blogs. Agreement with the statement that 'the technologies used to deliver the online content in this unit performed satisfactorily' increased from 68.2% in 2008 to 76.0% in 2009.

The Ning.com site took over the role of DSO as the LMS for this studio, serving as the location for unit materials, forum for online chat, resource exchange, and linkage to digital assessment. The interface, ease of operation and similarity with FaceBook provide significant potential for this to be explored further in the digital design studio setting. One may question the need for an expensive university-based learning management system when free alternatives are available.

4. Conclusions

The DSO LMS provides a platform to meet the basic needs of the university, however its effectiveness is limited by a Web 1.0 approach to learning and teaching. The educators have achieved significant learning outcomes by working outside of the system through engagement in Web 2.0 technologies. The design studio is particularly suitable for further exploration of Web 2.0 technologies, including social networking through ning.com and student-authored videos in YouTube, to enhance the LMS.

A hybrid or blended approach to digitally enhanced design education should engage in the positive attributes of each technology with the aim of balancing learning outcomes with staff and student time overheads. The universities' need to control information needs to be balanced by an informed response to educational opportunities offered by Web 2.0 technologies. Significant potential exists for working within an online social network setting, where educators can create a learning environment that relates to, and responds to the needs of the Web 2.0 generation.

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