FUTURE PATHWAYS – LOCKED GATEWAYS:
Questioning the effectiveness of online tools for tertiary design education

Geoff Hinchcliffe School of Design and Architecture University of Canberra, Australia

ABSTRACT

For educators, students and learning institutions, online education offers great prospects; remote access, internationalisation, quality assurance, flexible delivery, yet there is little evidence that Australian design schools are embracing the potential of online learning. Given the progressive teaching practices of many design schools, the resistance to new educational opportunities is surprising. This paper proposes that the biggest hurdle for design education online is the technology: the Learning Management System/s (LMS). Based on the experience of design students and staff using WebCT (the world's most popular LMS), significant inadequacies are identified. In response to the issues raised, new design solutions and related theories are explored. It is the view of this paper that a vibrant and vital communication in our virtual classrooms requires the same communication freedoms allowed in the physical classroom. It will be argued that a LMS that goes beyond practical, administrative functions and promotes an active online community in a graphically engaging environment will better serve the pedagogical, cultural and ethical interests of design education.

INTRODUCTION

Using the Internet for the purpose of education holds great potential and risk. For example, on the one hand, online learning can be argued for on the grounds of equity: allowing students disadvantaged by distance an equal access to studies. Alternatively, it could be argued that the technological dependence of online learning favours those who can afford better technology and high-speed Internet connections. Both sides of the argument are valid, but this paper accepts the view that the Internet will be employed for educational purposes irrespective of arguments against - for while there are obvious issues and risks, the possibilities are compelling; access to larger Australian and international student markets, greater timetable flexibility for students and educators, easier monitoring of teaching practices for quality assurance, increased student to teacher ratio and lower staffing costs.

This paper is motivated by the fact that despite the apparent bonuses of online education, design educators appear to be reluctant to use LMS, even though advanced face-to-face teaching practices are commonly adopted in their physical classrooms. Attributing the LMS resistance to the incompetence of design staff is a convenient explanation, however, a growing body of research in interaction design suggests the technology itself is a significant factor (Norman, 1988; Cooper, 1999). Norman describes the typical circumstance where a user frustrated by a poorly designed product gives up and accepts the problem to be the result of their inadequacies (1988). This paper focuses on the technology in an effort to better understand where it fails and ways it can better meet the needs of design education.

WebCT will be used as an example as it is the LMS used by the University of Canberra's school of Design and Architecture, where the research for this paper was carried out. Based on the experience of staff and students, key issues will be identified with the WebCT LMS, and alternative, appropriate solutions offered. The

key issues to be explored relate to technology, pedagogy, and experience/community/culture.

1. Technology

The Internet was not originally invented to support the uses to which it is put today, and it has been steadily hacked and modified in an attempt to make it support the advanced graphical interactions and rich media forms that users demand (Heller, 2003; Hinton, 2004). In the case of LMS, their current form and functionality is generally a reflection of current web conventions (Nielsen, 1999; Krug, 2000; Adkisson, 2003), rather than being optimal designs for meeting end users' needs. For example, WebCT is a 'Content Management <u>System</u>', and while it is accessed via the Internet, it acts as an 'application' for developing and managing teaching resources. The 'page' metaphor on which the entire system is based is irrelevant – 'pages' suggest a book, or magazine, not an application. The obsolescence of using pages in an application is remarkably easy to demonstrate – simply imagine trying to use any desktop application in a page-based version (fig.1). Using WebCT to manage files exemplifies the unnecessary complexity that is introduced with the page metaphor:

Task: Move a file to a new location

Desktop computer	WebCT
Drag the file from its current location to the new location.	Click on 'Organiser Page' Click 'Add page or tool' link Click 'single page' Enter a title for the item Click the 'Browse' button Click the radio button next to the file Click the 'Add selected' button Click on choice for where to put new file Click the 'Add' button
Time: 2 seconds	Time: 40 seconds (for the initiated)

Creating web applications without the page metaphor is not impossible, just not conventional or easy. Current LMS are artefacts of the Internet's evolution over the past ten years, in the same way that early cars were artefacts of the horse-drawn buggy. While the technological constraints of online systems can be appreciated, end users don't care and shouldn't need to care (Cooper, 1999). They want a modern, powerful, stylish, luxury vehicle (a Porsche or an Audi would be nice), not a model T Ford. To meet users needs, designers and developers must be willing to abandon inadequate technologies and conventions, and adopt or invent appropriate solutions for a particular situation (Heller, 2003). The page metaphor is just one obvious example that illustrates how LMS are governed by technology and developers rather than designers with end users' needs in mind (Cooper, 1999). Wajcman uses the concept of *social determinism* to suggest that technology is shaped by the social/cultural context in which it is created. Unlike technological determinism, which sees technology as neutral, the social determinist view regards technology as biased, representing the interests of those who create it and control its development (1991). Software will always be constructed by developers and businesses motivated by profits; so how can a user-friendly product be created if, as Wajcman claims, technology represents the interests of the culture in which it was created? Cooper offers a development solution in the form of 'Goal Directed' design (1996; 1999). In essence, this

method is based on acquiring sociological data about the software users, and refining this information into a user profile, or 'persona' (Goodwin, 2001). The persona represents the benchmark against which all design and development decisions must be measured; only those designs or technologies that serve the interests of the persona are adopted. The attitudes of design educators and students represented in this paper were gathered using methods based on Cooper's goal-directed design methodologies. Staff and students were observed and interviewed over the course of two semesters, and the results used to guide the design of a prototype LMS, elements of which will be discussed in this paper. It is important to emphasise that the use of sociological data is not a design solution, merely relevant information for the designer (Anderson, 2001). The success of a design lies in the ingenuity and ability of the designer in defining and serving the needs of users (Chan, 2004). In addition to the sociological approach of Cooper, the research and development discussed here has been informed by diverse design examples and theories, such as Glanville's ideas on the design process; in particular his definition of design as a journey, and the process of discovery that is fundamental to all design, no matter how creative or scientific (1991).

Not surprisingly, the complexity of the WebCT file management serves as a great disincentive to design staff considering utilising the LMS. In answer to this fundamental issue, the proto-LMS emulates the 'drag and drop' functionality of the computer desktop, with which most staff are already familiar, thus providing the user with instant comprehension of how to interact with the LMS. In a working prototype, the time taken to move a file to a new location was reduced from 40 seconds (with WebCT) to 3 seconds. User recognition of folders, and different file formats was immediate, as they too emulated the desktop conventions. The 'drag and drop' design is a powerful convention, and in addition to ease of use, it provides the user with a clearer conceptual model of what they are engaging with; files, folders and applications on a remote server. The graphical representation of the file management facility also aids user comprehension. By representing the remote server and the user's local computer in two separate columns, the user can appreciate the relationship between the local machine and the remote server. To move a file, the user physically (though virtually) drags it from the local computer column to the remote server column. Such graphical representations have been employed in successful 'ftp' (file transfer protocol) client applications such as Transmit (fig.2). By contrast, the pop-up windows used in WebCT provide no indication of the relationship between the local and remote computers, and instead of 'drag and drop', WebCT uses radio buttons and check boxes; elements that are more akin to quizzes or survey forms than file management procedures.

2. Pedagogy
The quest to incite 'deep learning' (Biggs, 2002) in students is of primary importance whether it be online or face-to-face teaching. While there is great scope for analysis of the pedagogical qualities of the resources created with LMS, the major concern for art and design educators is a fundamental one; LMS do not currently support their existing teaching practices. WebCT favours a text-based lecture model, rather than the practical tutorial/studio model that is commonplace in Australian design schools. Given that so much design work is now done on computers, it would seem logical that design education would make an easy migration to a computer mediated format, but without the tools to support the modes of workshop/tutorial teaching that design educators and students are accustomed to, the LMS is virtually useless. A typical face-to-face design teaching scenario may involve a literal round-table discussion of works in progress, design concepts, techniques, and include demonstration of design

suggestions, or new techniques. The class could be asked to complete a task in groups and present their results to the class. In the mediated space created by WebCT, this sort of rich, live communication is not feasible. The WebCT Chat tool supports only simple text communication, and the sharing of graphical works for discussion involves a work-around solution[1]. So, while it may be possible, it is far from ideal, needing great effort and experience on the part of the instructor to set up (Tillotson, 2002), and great perseverance on the part of the students to work through the different processes required to share their work and ideas with classmates.

A productive physical classroom can be a hive of activity, yet a virtual classroom mediated using WebCT's text only Chat application is a sterile, guarded environment. Green highlights the fact that a 'technoculture' arising from mediated communication is a product of the communication tools employed (Green, 2002). It follows that a vibrant and vital culture in our virtual classrooms will require the same communication freedoms allowed in the physical classroom. The prototype LMS features a mediated tutorial space (m-tute) that more appropriately represents a virtual tutorial space suited to design education. M-tute combines synchronous chat with a shared virtual space where students and instructors can display work for class inspection and discussion. Participants are able to add notes and sketch directly onto the image being discussed. M-tute supports multiple parallel communications, similar to the chatter that would be expected in a busy, productive classroom. Students can all participate in the general class discussion, but also have the capacity to target individuals (or groups) for private discussions parallel to the main discourse. These private chats are visible to all the members of the class, but not legible – much in the way that one can hear the whispers of a private chat, without understanding it. It could be argued that private chats raise ethical issues, as students may engage in private discussions at the cost of participating in the main discussion, but this prospect is really no different to the physical classroom, where discussions are kept in order through mutual respect and the arbitration of the teacher. Ironically, allowing communication freedoms that cannot be strictly controlled or monitored is a more sound ethical position than restricting communication for the fear of misuse, or for technical reasons (Robertson, 2004).

3. Experience, Community, Culture
In addition to the concept of technology bias mentioned above (Cooper, 1999; Wajcman, 1991), Lenker claims the dominant usability methodologies employed to test and justify software, such as today's LMS, place too much emphasis on practical concerns at the cost of the emotional, social and consumptive concerns of users (2002). As the web matures, the aesthetic or emotional factors of design are increasingly being recognised as integral to creating engaging online experiences (Lenker, 2002; Shedroff, 2001). Representing this trend, Donald Norman, the founding father of the 'function-first' User Centred Design (UCD) school, has entitled his latest book "Emotional Design" (2004), in an attempt to address the aesthetic blindness of the UCD movement. Aesthetically pleasing objects and interfaces have proven to be more satisfying to users, even when less functional than ugly alternatives (Norman, 2004). It should be obvious that to make a LMS compelling for design educators and students, the system should be visually and aesthetically engaging. The WebCT system interface is far from aesthetically engaging and does little to incite enthusiastic participation amongst design students or instructors. The interface of the proto-LMS has been realised in an imaginative and graphically engaging manner, with the simple aim to inspire greater enthusiasm in those required to use the system. Visual aesthetics

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[1] The WebCT Whiteboard does not allow image upload from a Macintosh computer; ironic given the Mac's long standing status as a design platform.

contribute to user satisfaction/enjoyment and the graphic representation of controls and information improve user comprehension (Norman, 1986), making it easier to use.

The proto-LMS supports various means of personalisation, where a user can exert some control over the appearance and function of the application. For example, the 'front-end' interface can be 'skinned', allowing students to use the application itself as an opportunity to learn about designing screen-based content. The skins can be shared with peers: a form of informal peer review and a community building exercise. Students have control over their screen name, screen icon, and the typeface their comments are rendered with. Personalisation in mediated communication may be regarded as unnecessary by some developers, but it is only a fraction of the expression that is allowed, and encouraged, in the physical tutorial room.

The insignificance of graphic design considerations in the WebCT interface can be insulting to people engaged in the study of visual communication, and is a telling indication of the priorities of the developers who created it (Cooper, 1999). Experiential concerns of the students are virtually ignored, with administrative tools for instructors taking the centre stage. The promotion site for WebCT Vista 3.0 cites no experiential benefits for student users, instead emphasising the ease for instructors in assessing student's contributions to the discussion:

> **Gradable Discussions**
> WebCT Vista 3.0 adds a central grading area to the discussions tool, allowing instructors to efficiently evaluate and grade student participation in class discussions. Instructors can easily assemble and review a student's posted messages, review a student's total participation versus the class average, and assign a grade to each student that is automatically recorded in the gradebook, saving instructors time and allowing them to focus on the quality of student contributions rather than the mechanics of grading.
> (http://www.webct.com/products/viewpage?name=products_vista_3.0)

Can we really expect students of design to be excited about acting as human subjects in an assessment machine? And what of the quality of student contributions when the primary motivation is grading? – Grade-grubbing generally results in a shallow learning experience for students (Biggs, 2002). By contrast, making learning stimulating and enjoyable are common strategies for inciting self-motivation and deep learning (Biggs, 2002; Cameron, 2000; Toohey, 1999).

Harris indicates that the lack of facilities for social contact is the most common student criticism of LMS, and the inclusion of facilities for incidental social contact has proven to enrich online student experience and learning (2003). The entire M-tute application is a shared space and by placing the practical, functional elements in a community space, the proto-LMS encourages the incidental social contact between students that is essential to building a healthy student culture (Harris, 2003) – a facility that is sadly lacking in WebCT. For example, a student logs into the proto-LMS to check the Notice Board and, while doing so, sees that a peer is also logged in. After checking the board, or posting a notice, they may engage in a chat with their fellow student, as one would in a corridor of a physical learning institution.

Because the virtual classroom can resemble Bentham's panopticon, with paranoia amongst participants that every comment is being observed and recorded by the authorities, it is important for the interface design to make the virtual classroom as comfortable and conducive to free discussion as possible. Imagine a physical analogy:

WebCT	M-tute
A bare cement cell. The room contains the necessary technical requirements but assistance is required to learn how to control features such as the fluorescent lighting and the whiteboard. Communication in the tutorial room is conducted using the full formal title of participants. The acoustics of the room ensure that all conversation is heard at the same audio level. Extraneous distractions (such as windows and decorative elements) have been removed.	A simple room that that is furnished and decorated by the students. The arrangement of the space encourages group work, yet supports a solo address from a tutor. The room contains only the necessary technical requirements – additional features are available but only if needed. The controls for all of the room's features have been designed for easy access and control by staff and students. The room and the furnishings have been designed to create a comfortable atmosphere for discussion and collaboration

Which tutorial room would you prefer to teach, or study in?

CONCLUSION

Understanding the particular needs of design education is the first step to developing an adequate LMS for design education. To be enthusiastically embraced by design educators and students, a LMS must be more than an administration tool for instructors, and consideration of the user experience given far greater importance – learning online can, and should be engaging and enjoyable for both staff and students. A healthy online culture is critical in the creation of a positive learning experience, and because online cultures are limited by the capabilities of the communication tools used, a LMS must provide the means for social, community building communication. In essence, a LMS suitable for design education should represent the priorities of design communication, functioning on practical and emotional levels in order to provide a compelling online experience.

Design educators have defended their tutorial/studio-based models against financial and administrative pressures for important pedagogical reasons. When it comes to online teaching, design educators must again hold their ground and maintain teaching practices that best represent their pedagogical interests and students needs. Quite simply, educators and students need appropriate tools and technologies if the potential of online design education is to be realised.

Geoff Hinchcliffe is an Associate Lecturer in Graphic Design at the University of Canberra. He is a graduate of the Canberra School of Art's Graphic Investigation workshop and has practiced as a graphic designer for over 10 years, working in print, web, interactive media and television. He is currently engaged in a Masters by research in the University of Canberra's School of Creative Communication.

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