

The ‘Tutorless’ Design Studio: A Radical Experiment in Blended Learning

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ABSTRACT

This paper describes a pedagogical experiment in which a suite of novel blended learning strategies was used to replace the traditional role of design tutors in a first year architectural design studio. The pedagogical objectives, blended learning strategies and outcomes of the course are detailed. While the quality of the student design work produced by the blended learning design studio was independently assessed as being of a high standard, the student feedback on the course was mixed. Given the equivocation evident in the student feedback, the paper concludes by speculating on factors beyond the educational strategies that may have led to the high quality of student design work.

Keywords: Blended Learning, Problem-based Learning, Design, Design Studio, Architecture, Education, Pedagogy, Foucault, surveillance, Hawthorne Effect.

INTRODUCTION

University administrators often grumble that the traditional design studio model of teaching used in architecture programs is expensive compared to the teaching modes commonly employed across rest of the university. The largest component of the cost is the salary paid to design tutors who teach for relatively long periods to relatively small tutorial groups. We therefore asked the question: ‘Is it possible to use contemporary blended learning strategies to dramatically reduce, or even eliminate the role of design tutors in the studio, while still maintaining the quality and character of the traditional design studio?’

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With the assistance of an Education Innovation Grant provided by our university, we developed a course that integrated various blended learning strategies to deliver a studio project that required no design tutors. The studio ran as a stand-alone design studio for the first 5 weeks of the 13-week semester. Students working in the normal physical studio setting engaged in large numbers of small design tasks that were delivered online and were supported by daily lectures. The tasks were intended to develop their 'generic' design skills while also building incrementally toward a single final design outcome for the studio project. The only individual, one-on-one feedback the students received was given by a design jury on the final afternoon of the 5-week studio project.

The quality of the students' design work, independently assessed by the jury, was considered high. Feedback from the students who experienced the experimental design studio was mixed. The financial saving from not employing design tutors for the duration of the experimental design studio was substantial. This saving was reinvested in employing more tutors in the second half of the semester for this same cohort of students, allowing the studio group size in the second half of the semester to be reduced from the standard 18 students per group to 10 students per group for the remainder of the semester, which students greatly appreciated.

This paper details the blended learning strategies employed in the design studio, including novel approaches inspired by aspects of the traditional design studio, itself a variant of problem-based learning. The learning management system and e-Learning platforms are explained. The feedback from students, describing their perception of the strengths and weaknesses of the blended learning experiment, is summarised. The paper concludes by speculating on how issues of power, control and surveillance might have operated in this e-Learning environment; these, it is suggested, might help explain a conundrum raised by the whole experiment: given the student feedback was mixed, what led to the high quality of design work?

THE TRADITIONAL DESIGN STUDIO PEDAGOGICAL MODEL

Currently, architectural design studios undertaken at our university are normally timetabled for one seven-hour day per week for the 13-week duration of the semester. The design studio day generally begins with a one- to two-hour lecture, followed by five to six hours of design tutorials. Tutor group sizes are stipulated to be as close as possible to 18 students, and are taught by either an academic with architectural experience or an external architectural practitioner employed casually.

Historically, the relatively high cost of the design studio pedagogical model has led to ongoing attempts to achieve financial savings in studio teaching. For many years, the number of tutorial hours has been gradually diminishing, tutorial group sizes have been gradually increasing, and reduced pay rates for tutoring in the studio have resulted in more junior practitioners being employed as design tutors. A comparison with the situation a number of decades ago highlights the change in studio resourcing: in 1973 the design studios in our architecture program had two full days of studio teaching per week with

no greater than 12 students per design tutor group, and tutors tended to be experienced (and sometimes eminent) practitioners.

In terms of the content of a typical design studio, at the beginning of the semester students are given the brief for an architectural project of a complexity and scale suited to their point of progression in the program. Over the course of the 13-week semester, students develop a design solution for the project, most often working individually, but occasionally working in groups of 2 or, less commonly, 3. On each design studio day, tutors give students feedback on the progress of the development of their design. At intermediate points within the semester and at the end of semester a small jury of practitioners and academics assess the student's work and provide formative or summative feedback to the student as appropriate.

The traditional design studio pedagogical model is effective for *deep learning* because students learn by 'doing' design. The design studio pedagogical model is a unique variation on problem-based learning and teaching, where the student is set a problem and then develops a solution to the problem with varying degrees of guidance from an educator. In educational environments such as health and medicine, problem-based learning is a well-established pedagogical method (Neville, 2009). In medicine for example students may be given a set of patient symptoms, and asked to undertake research to determine (i) a diagnosis and (ii) a treatment regime. In the medical context there is a generally a relatively small set of 'correct' (best practice) answers to the problem that has been set. By contrast, the equivalent problem-based learning task in the design studio produces a potentially infinite number of 'correct' (workable) design solutions. Because every student's design develops along a unique trajectory, every student's design requires unique feedback, giving rise to the need for students in the design studio pedagogical model to have intense face-to-face, real time engagement with a design tutor.

BLENDING LEARNING

'Blended learning' combines digital and online media with traditional modes of educational content delivery. In our case, traditional lectures were combined with pre-designed course content delivered online to students in the physical setting of the traditional design studio.

The most radical goal of this teaching/learning experiment was to find a way to use blended learning to *replace* design tutors *without* compromising the traditionally successful method of students learning to design by 'doing' design. The difficulty of course, and the most challenging and exciting aspect of the experiment, was finding an answer to the problem of how a course using primarily pre-designed content rather than tutors could be responsive to the unique trajectories that each and every student's design would inevitably take. Providing formative feedback to each student's unique design development has been the traditional role of tutors; so how could the individual feedback normally given to students by tutors be provided in a tutor-free, blended learning, design studio?

This central challenge of replacing the role of tutors in providing feedback on the unique trajectories of student's design development was ultimately addressed in three ways:

- (i) Students themselves were taught specific skills for critically reviewing design work. Students were then asked to provide critical reviews of their peers' designs. Time was allocated for peer-to-peer design reviews, which were carried out in groups of 4 (3 students critiquing one student's work at a time, in rotation). Participating in the peer-to-peer reviews was an assessable component of the course.
- (ii) A portion of the lecture at the beginning of each studio day was used to give feedback to the whole cohort on common design issues that had been identified in students' developing designs. The success of this process was dependent upon the fact that students were required to digitally upload their current designs the evening before the design lecture, allowing the coordinator time to identify issues and use images of the students' own designs to illustrate common problems and possibilities.
- (iii) The traditional jury panel of architectural practitioners provided feedback on each student design on the final afternoon of the 5-week blended learning design studio.

As well as trying to draw pedagogical insights from the traditionally effective studio model of teaching design, we also looked for opportunities to address any weaknesses we recognized in our current pattern of design teaching. One issue we identified was the failure of design studios to consistently provide a rigorous explanation of how designers design. Here we were working with the understanding that while every designer designs in a unique way, there are common skills/understandings that are used regularly in the design process that can be usefully learned by students. In this experiment we focused on the following common areas:

- Understanding place (site analysis/context analysis)
- Understanding and prioritising the desires of clients/users/stakeholders
- Understanding that design always take a position (designs are political)
- Understanding where design ideas come from (use of precedents/analogy/metaphor)
- Understanding the use of diagrams/partis/concepts
- Understanding that design is endlessly iterative
- Understanding passive solar design principles

Because students' understanding of the design process is currently gained piecemeal from successive tutors, the student's learning depends upon the often the variable understanding of the tutor and their ability (and time) to articulate key skills in the design process. Ultimately therefore the blended learning design studio had two key aims that were mutually reinforcing: to enhance the student's design skills through the process of *developing student's own unique solution* to a design project; to use the unfolding steps in the their own design process to *help students understand key 'generic' skills required during the design process*.

THE BLENDED LEARNING EXPERIMENT

The blended learning design studio was piloted on the full cohort of 160 first year architecture students. It ran in their second semester as the first 5-week phase of their major design studio unit of study — a 13-week unit that constitutes 50% of the load for the semester. With the assistance of an Education Innovation Grant provided by the university, course material was developed and delivered online in their familiar studio spaces.

The pattern of the 5-week blended learning design studio course was as follows: each day would begin with a 1-2 hour lecture, followed by a tutorless design studio of up to 5 hours in which online tasks were undertaken in small groups. On the final afternoon of the 5-week blended learning design studio a traditional jury panel of architectural practitioners provided feedback on the students' designs. The financial saving from not employing design tutors for the duration of the experimental design studio was reinvested in employing more tutors in the second half of the semester for this same cohort of students. This allowed the studio group size in the second half of the semester to be reduced from the standard 18 students per group to 10 students per group for the remainder of the semester.

THE DESIGN PROJECT

The design project used as the vehicle for the blended learning design studio was a small architectural intervention sited at the interface between the university and a large public park . On the university side of the public park a grand set of steps leads down toward the park, but the steps terminate at a fence separating the university from the park. There has long been an intention to create an entrance to the university from the park at this point. The student project imagines the removal of a section of the fence and the creation of a new entry to the university from the park.



(Image of the site for the studio project: Public Park in the Foreground; Fence, Stairs and Law Building Beyond) (Francis-Jones Morehen Thorp Architects)

Over the course of the 5 weeks of the blended learning design studio students were led through a four-stage design development process:

Stage 1: A park bench that ‘makes strangers talk to each other’

Stage 2: A cluster of park benches that encourage interaction (and also allow meditation)

Stage 3: A solar canopy over the park benches to admit winter sun and exclude summer sun

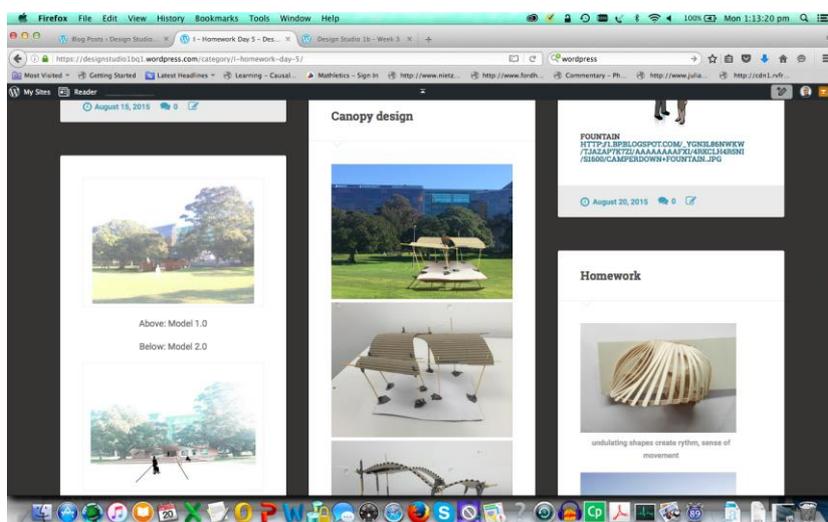
Stage 4: Transformation of the solar canopy to also act as an entry canopy signaling the threshold to the university

(The final 8 weeks of the semester used the same site for the design of a small café.)

THE LEARNING MANAGEMENT SYSTEM

All educational content, all tasks to be undertaken during design studio time, as well as all homework tasks, were made available online and accessed by the students using laptop computers, tablets or smart phones. Blackboard Inc. was our university’s principle eLearning environment. However it was decided that Adobe Captivate was most appropriate as the primary e-Learning platform. Students therefore logged-on to Blackboard and navigated to a Captivate file containing each day’s educational content and tasks. The educational content on the Captivate slides was communicated in succinct written language with supporting images and graphics as required, and was also voiced-over to assist students from non-English speaking backgrounds.

When students working in Captivate were ready to respond to a discussion question, or wished to submit a small design task or a larger homework design task, they uploaded their completed task via a link in the Captivate interface which took them to a Wordpress website set up to accept images of their designs as well as descriptive text. Each task had its own unique web page, thus when all students had completed a task there were 160 student posts for that task. Students were encouraged examine other students’ posts as part of the learning experience.



(Photo image of student posts on Wordpress: By Author)

For the lecture presentations prior to the studio sessions, the coordinator used selected posts of student designs to assemble a PowerPoint presentation in order to give feedback on the common design issues to the whole student cohort.

TIMETABLING OF THE DESIGN STUDIO

Unlike other design studios in our architecture program, which are only timetabled for one day per week, it was decided that the 5-week blended learning design studio could be timetabled for two days per week: Tuesday afternoons and all day Fridays. This was possible because the design studio had no casual design tutors and there was therefore only minimal extra cost in adding more studio time to the weekly program. This was an unanticipated opportunity offered by the blended learning program and reversed the decades long trend of trend of reducing design studio hours.

The standard weekly timetable therefore had two studio days, each beginning with a lecture that included the critique of examples of student work that had been uploaded onto the Wordpress site the evening before, followed by a design studio session in which online tasks were undertaken in the studio environment. At the end of each studio session, homework design tasks were communicated through the online Captivate interface and students were required to post their homework designs the evening prior to the next design day.

Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday
WEEKS 1-4			Lecture (+ Critiques of Homework Examples)			
			In Studio (Online tasks, Discussion groups of 4)			
Lecture (+ Critique)						
In Studio (Online tasks, Discussion groups of 4)			(Optional software tutorials 4-6pm)			
Homework (post online Thursday night)			Homework (posted online Monday night)			

Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday
WEEK 5			Lecture (feedback on student experience)			
			Students pin up work			
Lecture (+ Critique)			Tutors Critique Phase 1 Design			
In Studio (Online tasks, Discussion groups of 4)			Introduce Phase 2			
Homework (Post final design online)						

(Weekly timetables: By Author)

STUDENT EFFORT AND GRADING

The 5-week blended learning design studio was worth 35% of students’ overall grade for the Semester. The assessable components of the blended learning design studio were broken down as follows:

- Online tasks and homework tasks: 40%
- Critiques (written and verbal) of other students’ designs: 20%
- Final design (physical model and A1 panel): 40%

At the end of the 5 weeks students had completed:

- **65 small studio tasks** (discussed in groups of 4, posted individually):
 - These tasks related to the process of designing, and paralleled the progress of their own designing.
- **12 major homework tasks** (completed individually):
 - A design for a park bench that ‘makes strangers talk to each other’
 - An AutoCAD section through the site
 - A site analysis plan using Illustrator
 - A design for a cluster of benches
 - A sun control canopy (excluding/admitting sun from the equinoxes)
 - A physical model ‘Photoshopped’ onto real site photograph
 - 1:50 working model of design
 - 1:20 section of detail component
 - 1:100 site model
 - 1:100 working model
- **2 critiques** of other students’ projects
- **Final design** presented to jury on last day (completed individually):
 - **1:100 model of final design**
 - **Final A1 Panel**

The cohort of 160 students produced in total 13,000 assessable outcomes that were posted to the Wordpress sites. Because of the large number, it would have been impossible to give formative or summative feedback to all of these design tasks. Students were therefore advised in advance that for the 65 small tasks, the 12 major homework tasks and the 2 peer critiques, we would be looking at only two simple criteria when we assessed their work:

- i. That the student had attempted the task (i.e. we were not assessing the quality of the work)
- ii. That the student had taken the task seriously (i.e. that there were no blank or frivolous posts)

If a student’s work met these two criteria, they would receive the full grade for that component of the course. This was considered fair, as the students were doing what appeared to be a significant amount of work for a relatively small proportion of their grade. Also, because the online tasks represented a fairly small percentage of the whole semesters grade (60% of 35%) it did not excessively distort each student’s overall grade for the semester.

This ‘liberal’ approach to grading appeared to encourage a high level of student compliance with task completion. This was a positive outcome in two ways: from the student’s perspective they felt it was an ‘easy’ way to get a good grade for that component; and from our perspective as educators, both the student feedback and the quality of the final designs indicated that students benefited from undertaking all of the tasks.

A SAMPLE OF THE BLENDED LEARNING COURSE

Online teaching and learning commonly utilizes the following sequence of pedagogical steps:

1. Provide the learner with the information necessary to answer the question or task in step 2 (below)
2. Set a task or question based on this the information in step 1 (above)
3. The learner responds to the task or question
4. If the response indicates satisfactory learning, the learner moves to the next module of information

The deep learning achieved by problem-based pedagogy (which includes the design studio pedagogical model) is achieved through a different sequence of steps:

1. Set a task or problem
2. The learner researches and develops a response to the task or problem
3. Feedback is given on the learner's response

Rather than utilize the more common online pedagogical steps, all of the tasks set in the online component of the blended learning design studio use the problem-based pedagogical steps, where students are first asked to contemplate a question or issue *before* being given information relating to the issue or question. To encourage students to engage with different views on each issue, students were required to discuss/debate each question or issue within a group constituted by four of their peers. This debate/discussion occurred in the physical setting of the design studio. Only when students had posted their own answer/response were they given a 'guide answer'. It was made clear to the students that the answer provided was not definitive and that they may have in fact developed a better answer.

The following extract from the online Captivate slides demonstrates how students were encouraged to discuss and develop their own position on an issue before being given a 'guide answer'. The issue in this case was the way in which designs always 'take a position.' Students were asked to discuss whether a design could satisfy all stakeholders' needs equally or whether designs inevitably privileged particular stakeholders needs over others.

TAKE A POSITION!

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1.

You now understand some of the needs of the stakeholders (client, users etc), and some aspects of the context in which the design will be placed.

But are all stakeholder needs and all aspects of place to be given equal importance when you are designing?

Discuss this in your discussion group. Post a brief answer on the shared space.

Estimated time for this exercise: about 10 minutes.

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2.

[Click here to go to the page where you post your answer]

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3.

[If you haven't already, click here to check out other students' answers to this question.]

[If you are the first to post an answer, then there won't be other students' work to see. Return to the site later to check out the other students work.]

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4.

[Suggested Answer:]
All stakeholder needs and all aspects of place are **not** given equal weighting when designing.

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5.

[Suggested Answer continued:]
A good design solves many issues at once (eg. buildability, affordability, low environmental impact)

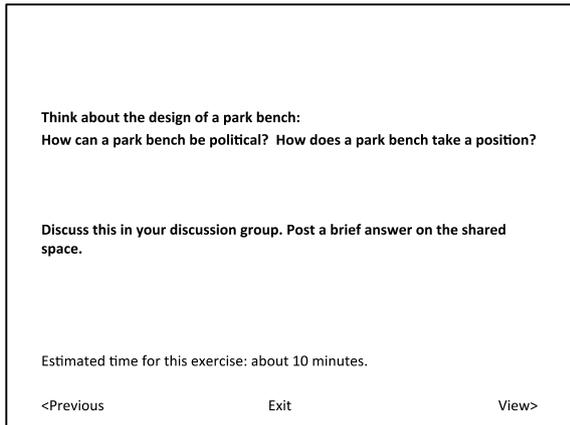
BUT

it is important to understand that all designing is in a sense political, and that all designs are **pro-positions** that **take a position**.

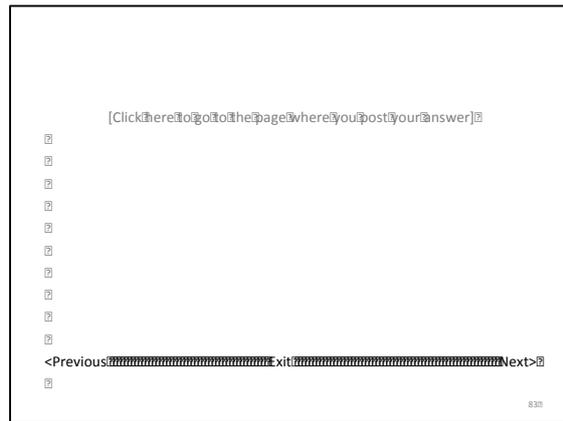
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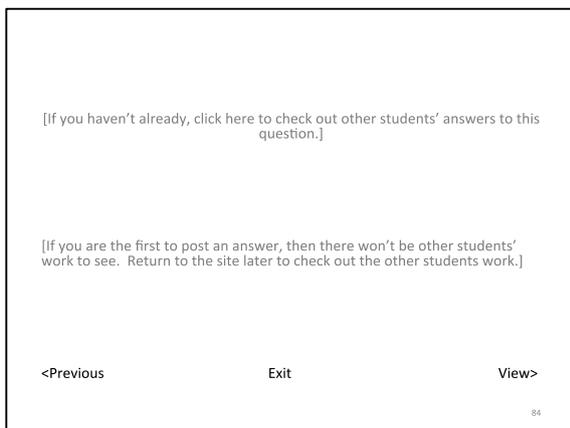
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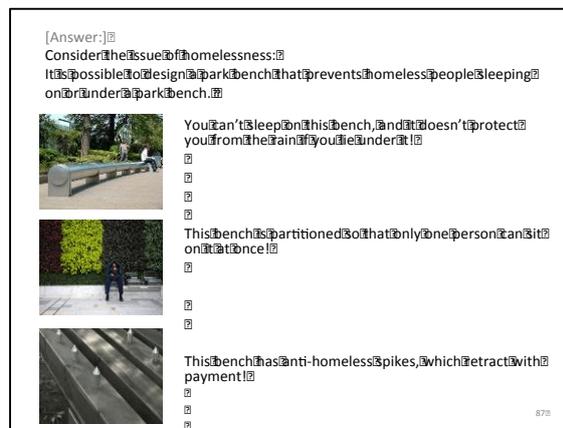
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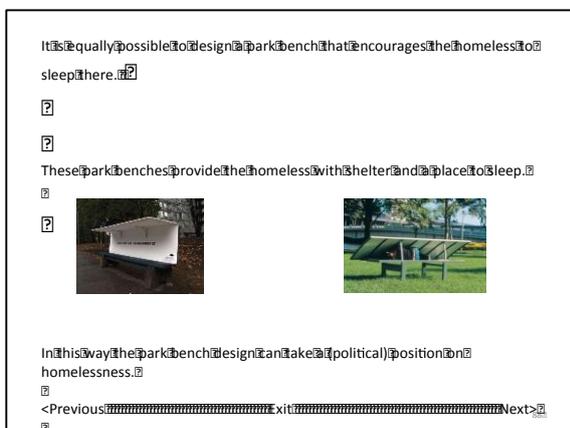
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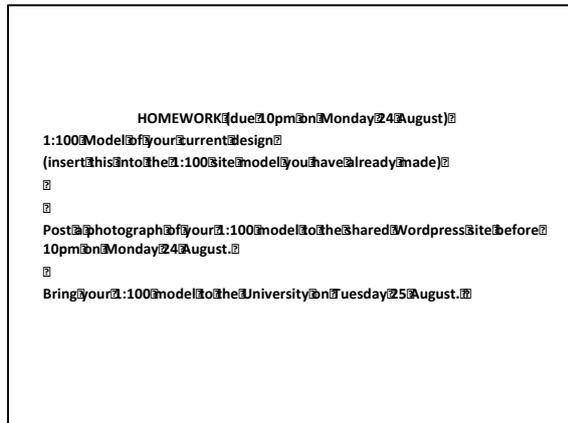
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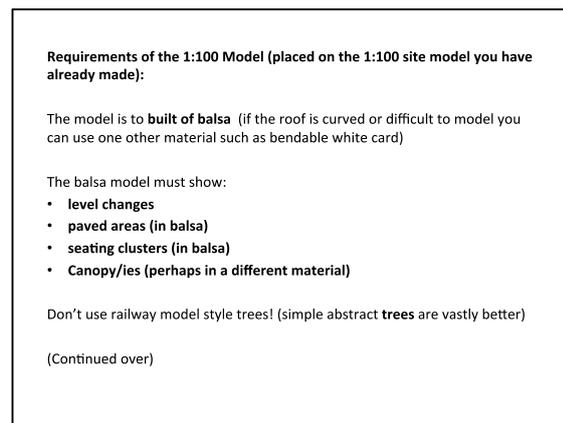
(Screenshots of Captivate Slides: By Author)

At the end of each design studio day students were allocated a homework task that was to be completed individually and posted on the Wordpress site on the evening before the next design studio day. The homework task was communicated online via Captivate. A typical homework task is shown below:



1.

(Screenshots of Captivate Slides: By Author)



2.

THE QUALITY OF STUDENT WORK AND STUDENT FEEDBACK

On the final afternoon of the 5-week blended learning design studio, students presented their designs to a jury of architectural practitioners and academics who were independent of the team who developed the blended learning studio.¹ Jurors gave verbal and written feedback to the students and grades for each student design. The feedback from jurors along with the student grades indicated that the design work produced by the students was, on average, of a high quality relative to comparable cohorts. The median grade (for the final design only) was a Distinction (on a scale of: Fail, Pass, Credit, Distinction, High Distinction), and the mean numerical grade was up to 5 marks higher than the previous 3 comparable first year design studios.

Students were invited to provide feedback on their experience of the blended learning design studio in a number of ways:

- An open forum on the final day of the blended learning design studio
- A specially designed, confidential survey instrument asking about the student's experience of the blended learning design studio
- A standard unit of study survey form that allowed comparison to previous student feedback for comparable design studios

The feedback indicated that students *really liked* some aspects of the blended learning design studio, and *really disliked* others. Key points of the student feedback were as follows:

- In response to the lack of tutors:
 - Students *disliked* lack of individual feedback;
 - Students would have *preferred* to have more access to tutors;
 - However student *really appreciated* the small tutors groups (of 10 students rather than the standard 18) that they had in the last part of the semester as a result of the financial

¹ Many of these jurors were employed as design tutors for the subsequent phase of the design studio project that ran for the remainder of the semester.

savings made not employing tutors in the blended learning design studio in the first 5 weeks of semester. It should be pointed out however that the financial saving on the first iteration of the blended learning design studio was in one sense artificial, in that the \$32,000AUD development cost of the course was via an external grant and not part of the calculation of the financial saving. It would therefore not be until the second iteration of the unit of study in the following year that an actual financial saving could be claimed.

- In response to the online tasks delivered via Captivate in the physical studio setting:
 - Students felt that the flow of the discussion was disrupted by the presence of a computer screen in front of every student.
 - Having a discussion in a group of 4, then having to post the outcome of this discussion individually was found to be annoying. A future iteration of the learning management system would attempt to make it easier to post group responses to a task.
 - The physical studio space was cramped, which resulted in groups being squeezed together, also impeding the flow of discussion. A future iteration of the studio would permit student groups to roam rather than be tethered to the physical studio space.
 - Some students were able to hack the captivate program and jump ahead to the task answers before posting their own answers. This both undermined the pedagogical goal and annoyed students who were ‘doing the right thing.’
 - Students preferred the larger ‘fun’ design tasks (such as spending an afternoon as a group designing a park bench that made strangers talk) to the smaller more theoretical tasks.
- In response to giving and receiving design critiques from their peers:
 - The level of student appreciation of this strategy appeared directly related to the quality of the criticism the student received.
- In response to the homework design tasks and the design feedback to the whole cohort in the lecture theatre:
 - Students thought homework tasks helped their learning.
 - Students found lecture theatre feedback to homework tasks useful.
- In response to students being able to see other students’ work posted on the Wordpress site immediately upon completion of a task:
 - Students’ responses indicated they greatly appreciated this facility.
 - Students found it helpful in terms of their own learning.
 - Students found it reassuring to know in real time that other students were progressing (or struggling) in similar ways to themselves.

CONCLUDING SPECULATION

Overall, this experiment in using blended learning to create a ‘tutorless’ design studio can be seen to have had mixed results. Deriving pedagogical strategies from the traditional design studio and reinterpreting them for an e-Learning environment indicates sufficient promise to warrant further

development of the pedagogical method. However student feedback indicates that they did not appreciate the ‘tutorless’ teaching environment and would have preferred more face-to-face tutoring. Nevertheless the quality of the design work produced by the students was independently assessed as being very high. The outcome of this experimental blended learning design studio thus presents a conundrum: given that the student feedback regarding the pedagogical strategies was mixed, what led to the high quality of design work?

As there is no way of establishing a causal relation between the individual strategies used in the blended learning design studio and the quality of the student design work, we can only speculate on what may have contributed to the high quality of the final design outcomes based on our observations in the course of the running of the studio. It may have been some particular aspect, or multiple aspects, of the pedagogical approach of the course, but it is also possible that something beyond the particularities of content and pedagogical strategies may have been in play. We suggest two such speculative explanations: the ‘Hawthorne effect’; and Foucault’s ‘Panopticon’.

The Hawthorne Effect

From 1924 onwards, time and motion experiments were carried out at the Hawthorne works of the Western Electric Factory outside Chicago to determine if certain changes to indoor environmental conditions (particularly lighting levels) would improve worker performance. Oddly, the experiments appeared to show that worker performance often improved even when the changes to the conditions were negative. Later researchers suggested that simply the novelty of being research subjects and receiving increased attention might have contributed to the increased productivity (Mayo, 1945).

In the case of the blended learning design studio, the project team contacted the students prior to the commencement of the studio to inform them that they would be part of a novel experiment in design education. During the running of the studio, the project team continued to impress upon students that they were the subjects of special attention, welcoming feedback on the progress of the course at any stage. The so-called ‘Hawthorne Effect’ suggests that the degree of attention given to the students, not simply (or even) the nature of the blended learning studio itself, might have contributed to the students’ diligence and therefore the high quality of their design outcomes.

Foucault’s Panopticon

A slightly more disquieting explanation of the high quality of student design outcomes relates to Foucault’s use of Jeremy Bentham’s panopticon prison as a metaphor for the increasingly ubiquitous surveillance in modern societies (Foucault, 1977). In the panopticon prison layout the guard tower was located centrally to allow guards to see directly into every prisoner’s cell. The guard tower was kept sufficiently dark that prisoner’s could not tell whether or not they were being surveilled. Foucault suggests that the prisoners’ uncertainty about whether they were being surveilled led them to assume they always were, and modify their behaviour accordingly. In other words the particular nature of the surveillance, which is not unlike ubiquitous contemporary CCTV installations for example, led subjects to self-discipline.

In the blended learning design studio, students posted every answer to every task and every item of homework to a Wordpress site that may (or may not) have been viewed by other students as well as the course coordinators. Students were told that while they would not be graded on the quality of their responses, the coordinators would check that they did the required items of work and that there were no frivolous postings. In reality having 13,000 student tasks to check meant that scrutiny was very cursory. However, following Foucault's logic, the very possibility that their work may be scrutinized might have led students to 'self-discipline' and act as though it would. This too may have contributed to the students' diligence and therefore the high quality of their design outcomes.

The blended learning design studio is currently being modified to address the weaknesses and reinforce the strengths identified by the student feedback, in preparation for a future iteration.

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