



Project X: The Experience of Student-led Multidisciplinary Design Courses across 3 Faculties at UNSW

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Abstract

This case study describes two elective multidisciplinary courses involving the design, development and fabrication of a built work to a brief, timeframe and budget on the main campus of the University of New South Wales. The courses involved collaboration between three Faculties of the University, namely, the Faculty of the Built Environment, the College of Fine Arts and the Faculty of Engineering.

What's in this case study for you?

This study will be of interest to you if you are looking for ways to create multidisciplinary courses or experiences for students. It describes the strategies, benefits and challenges involved in creating multidisciplinary studio/workshops involving three Faculties.

Student learning issues addressed in this Studio

[from ConnectED paper, Longbottom et al] Prospective employers in design firms of all kinds, from media to products to vehicles to buildings to large infrastructure projects, are calling increasingly for design graduates with greater flexibility and breadth of vision. While highly specialised analysis and design will remain essential for satisfactory design outcomes, it is becoming increasingly automated. The design agenda itself is increasingly set by graduates who

have cultivated breadth as well as depth – who can assist in the search for the human, and sustainable, face of technology.

In this context, the design lead will be taken by the innovator who can work across traditional discipline boundaries. The authors believe that bolder cross-disciplinary initiatives will be needed at university level to address this trend. Project X breaks new ground with the exceptionally broad spread of its participants testing the traditional design view that it is the act of a designer to conceive a design resolve the design and relise the design.

Other important issues which are central to our philosophy are:

- The need to work in teams
- Working with a client, the client's money and the client's time frame
- Working with the relevant industry partners
- Often students in creative arts programs are not clear about the professional opportunities available to them after their degree. One of the core courses offered in the third year of the degree program (Arts Business Practice) explicitly addresses professional pathways for students. That is, it is designed to develop the skills (academic, organisational, planning,



initiative etc.) associated with various professional pathways e.g. pathways into industry, teaching and research.

- Budget tightening continues to affect how studio teaching is presented and modelled for students. Creative Arts folk realise this and work to the strengths of this where possible by employing innovative strategies such as peer mentoring and staff demonstrations of practice. For example: students undertaking a studio in first year will be timetabled at the same time with corresponding 2nd and 3rd year studio courses that use the same lecturer/practitioner. What is encouraged here is peer mentoring across the year levels so that studio time is enriched by multiple voices and reflections upon the work in progress. This also models collaboration and micro-networks in the industry and resists the often upheld (but misguided) arts practice of isolation in art making. By 3rd year, these networks and collaborative practices are more specifically directed towards inter-disciplinary connections with students in their core courses (those mentioned in this study).

Strategy

(a) background

The UNSW ConnectED Conference in 2007 was hosted by the Faculty of the Built Environment, Faculty of Engineering and College of Fine Arts. In the “early developmental stages of this conference it was decided to include a multidisciplinary design project as a feature for ConnectED 2007”. Each of the Faculties include Design in their own programs and courses but this was the first time they had collaborated in such a way. The three Faculties, in conjunction with Learning and Teaching “agreed to explore learning and research opportunities in both multidisciplinary design studios and fabrication and construction workshops that engage

undergraduates and academics with the wider community, industry and the professions.

The multidisciplinary courses that grew out of the ConnectED Conference track five learning threads:

1. design studio
2. fabrication workshop
3. managing diminishing budgets while aiming for quality outcomes
4. shop drawings and fabrication
5. student-led courses and assessment
6. construction
7. (future) POE

(b) description of the Studio Practice

Eighty-eight students and five staff from three Faculties (Engineering, Built Environment and the College of Fine Arts) signed up to the elective multidisciplinary courses – Project X (Multidisciplinary Design Workshop) and Project X² (Multidisciplinary Fabrication and Construction Workshop). Students from architecture, landscape architecture and industrial design (from FBE); design, sculpture and art (from COFA); and civil, environmental and photovoltaic (from Engineering) were all eligible to take part.

An underlying strategy of the workshops was to facilitate a learning environment where the students were largely responsible for decision-making and for taking action within the design and fabrication courses. The environment allowed students to focus on a clearly stated outcome and to produce an installation on time and on budget and be satisfied with the outcome. The role of the academics was to monitor students’ learning experience. This included allowing students to make mistakes and learn from them. The “free running” approach to the project created an environment where students were responsible for their own actions and decisions, both individually and as a group. This



approach necessitated a Risk Management Plan and occurred in the context of national and state occupational and health frameworks and liabilities.

Students were invited to agree on a project manager for the group, appoint student representatives, select research groups and make weekly reports back to the body of the students.

The courses

The students come from programs, which range from 3 years to 5 years and students are from second year through to post graduate.

The first course, Project X, involved the design phase. It was a three-week intensive course held in February of 2007. The second course, Project X² involved the construction and fabrication phase, and included a weekly class during Session 1, 2007. The three Faculties involved developed their respective course outlines based on a common agreed model. The coordination committee agreed on course components such as aims, outcomes, methods of delivery and assessment.

During the courses students designed, fabricated and constructed from cardboard and timber an enormous sculpture of a snake consisting of five massive arches and a head that was five meters tall. The sculpture was displayed for a period of 5 weeks on the main walkway of UNSW to celebrate multidisciplinary design education and the theme of the ConnectED2007 Conference.

Project X

[from Vrecelj et al] Project X, the Scheme Design Course, was run over a period of three weeks. Students from the three Faculties worked together in small teams to produce scheme designs against “a brief set by the Conference

Organising Committee (the actual Client). The designs were evaluated within the course by the Interim Jury and then by an external Project X Final Jury. The Final Jury selected the winning design which was then further developed, fabricated and constructed by multidisciplinary teams in Project X².

The project brief was to design a building, sculpture or installation that symbolised the theme of the Conference. The design brief included artistic, formal, functional, loading, sustainability, budgetary, and other performance criteria. The design concept had to be capable of subsequent fabrication and construction. The site for the building was the main walkway of the University of New South Wales underneath the building that was to host the Conference. This allowed the three Faculties to collaborate and apply their skills to a real project with real time constraints and a defined budget.

The Project X Studio was held at COFA in a large studio space that could accommodate 65 students, 4 staff members and various guests. Teams of 3 to 4 students worked on the design brief, each team consisting of students from the three Faculties involved. Students came from a wide range of degree programs including Civil Engineering, Architecture, Design, Industrial Design, Interior Architecture, Fine Arts, Landscape Architecture and Building Management.

The coursework included lectures, workshops, individual research, design, team management, digital and physical modelling, reporting and presentation. Academic staff were there to facilitate the design studio environment and to support teams. Lectures were given by practicing designers from arts, design, architectural, and engineering backgrounds, as well as by potential materials suppliers and sustainability specialists. Students had access to



computing labs, printing facilities, welding and timber workshops and the purpose-designed electronic interface Omnium (Bennett 1999). This facilitated communication between students in a format that encouraged participation without detracting from the studio.

A typical day consisted of a morning lecture/information session followed by teamwork and consultation in studio. The Interim Jury (consisting of a client representatives, guest critics and the four studio tutors) was held on the seventh day of the course. Student representatives had a role in the development and running of the studio and assessment criteria. Student teams were expected to present a design scheme and rational, a physical model in site context and evidence of construction feasibility. They were also encouraged to present digital modelling of the scheme (although the use of PowerPoint was banned).

An exhibition of the work for the Final selection Jury (consisting of a distinguished artist, architect, and engineer and non-academic guest jurors) was held on the last day of the course and a project was selected. The selected project was then handed out to students enrolled in Project X².

Project X²

[from Vrecelj et al] Project X² design development/construction workshop was offered as a standard once-a-week course in Session 1, 2007. The aim of the course was to empower students to lead the process with many unknowns; to design, fabricate, construct and to manage the project to construction and deconstruction on time and within a specified budget. A student who was enrolled in the course was appointed Student Project Manager.

The course included several distinct phases:

management, design development, sponsorship acquisition, prototyping and testing, prefabrication and construction, erection and deconstruction. For the first six weeks (during design development) Project X² was initially located at the Kensington campus of UNSW. After that teams moved to the Randwick campus for the prefabrication phase. On completion of the prefabrication phase the installation components were transported back to the main campus, to the building site, for construction. An academic staff member was engaged as the certifying engineer.

Discussion

(a) Benefits

The following benefits of this multidisciplinary project-based course have been identified by the staff involved (from Vrecelj et al):

a. *Identity*. Each member of the student teams tended to take on an identity associated with their background programs. The engineering students behaved as engineers within their group context. Likewise the group members from FBE behaved as architects/designers and the student members from COFA as designers/artists. The students were in a continual role-play through the course. Students communicated as if they were professionals and were under scrutiny to perform. They also learnt from each other. Artist/designer students witnessed the role of engineering design calculations while engineering students participated in discussions on the fundamentals of the design process, and on aesthetics. It would be easy to exaggerate the openness of these communications however. In fact continual effort was needed on the tutors' part to challenge stereotypical attitudes, sadly already adopted by many of the students. The reach of the project was of course exceptional, from artists to engineers, and staff themselves needed first to address their own preconceptions and attitudes in preliminary discussions, many of which are still ongoing.



b. *Responsibility.* Beyond cross-disciplinary discussion, team members also needed to perform their assigned role. COFA students would often conceive an imaginative idea that demanded a quick response on practicability from the engineers. Those engineering students who could present their findings in an open rather than a closed manner, assisted their team to progress toward acceptable solutions, rather than having to abandon whole themes.

c. *Individuality.* The brief developed as a design competition and was open-ended; each group devised its own individual solution. There was little scope or incentive for copying, and group members provided original and individual contributions.

d. *Innovation/Uniqueness.* Having an external jury introduced again the idea of a type of 'design competition' and realism into the course. The winning design as decided by the external jury would be built. The jury process emphasised the need for innovation and uniqueness. The outcome was not predictable.

Project X and Project X² have provided an exceptionally broad and rich multi-disciplinary design learning experience for around a hundred students at UNSW, from a wide range of design-based undergraduate programs.

(a) Challenges

Key challenges for us in designing this set of studio/workshops was

- for the academic staff involved in the courses was to “develop, and then to assess the benefits of, multidisciplinary settings across three Faculties and to encapsulate both professional and non-professional program requirements from the respective Faculties.
- for staff was to resist the temptation to

provide too much support to students at the expense of their learning. The courses were designed to be student-led and it was important that staff maintain a monitoring rather than hands-on role in the process. As the courses progressed, staff could clearly see the benefits of students learning from their mistakes and observed students becoming empowered by their gradual ability to find their own solutions to problems.

- not to interfere in a decision making process setup and managed by students
- how do academics set up a supportive yet not paternalistic environment for students to learn in

To merge 3 faculties seamlessly without disrupting the student learning experience

Student feedback and improvements

(a) Feedback

Surveys of staff and students involved were undertaken to establish the value of the process and outcomes of the courses. The results demonstrate that multidisciplinary student-led design and fabrication projects are “an exciting and viable way of achieving educational goals in both professional and non-professional degrees” (Longbottom et al).

[from Longbottom et al ConnectED paper]: The value of the process and outcomes from the project was assessed through a questionnaire. Students completed standard CATEI evaluations and an additional feedback form including a series of open-ended questions. Staff also completed a feedback forms. At this stage all of the feedback has not been analysed.

Other forms of feedback included student journals, Peer Assessment Sheets and Team Building Evaluation forms.



Quotes from students across the three disciplines (from Vrcelj et al):

"...The course helped me find out how wrong I was for having the impression that artists and designers are weird people that we as normal people can not work with. I found out that they can be smarter than us, " more normal" than us, and that we had to think a little bit outside the square to get to understand them more..." (FE student)

"I learnt the role of each professional area in the design process, encouraging creative thinking and group dynamics." (COFA student)

"Learnt what designers and architects do. Hands on experience of what it would be like in real life." (FE student)

"The experience with working in a compressed workshop environment was stressful at times due to impending deadlines, but it was all a good learning experience to plan our time effectively in order to meet these deadlines." (FE student)

"This class has helped me develop skills required to reach a consensus. This critical skill I'll be using in my professional career." (FE student)

"Overall in my opinion, this 3 weeks has been really challenging and useful to our future in possible work place." (FE student)

"I learnt that there's so much more to engineering than just technical structural analysis." (FE student)

"Learnt to work in a flexible manner, allowing for changes in the structure throughout my analysis." (FE student)

"This is more like the real world." (FE student)

"Every member in the team had something to contribute – surprisingly ideas from engineers were accepted into the design concept." (FE student)

"The team overall contributes equally to the design. Though there are ups and downs regarding the decision, especially engineering constraints on "why we can't build the structure". But most of the people in the team are open minded and accepts what we have to say." (FE student)

"The beauty of this project was that although we had a massive task, we also had 4 people working on it, hence lessening the workload." (FE student)

"Overall the group worked in an efficient manner, it was challenging for the group to keep a common goal, as students from different faculties wanted to work in different directions. However we managed to keep it all together and work as a team." (COFA student)

"Although many of us have been complaining about time constraints and not enough guidelines, in other ways it really did push us to our limits and made us learn and grow from it! It's GOOD!" (FE student)

"Sometimes it was very challenging to explain the whole conceptual process and design development to people who had never come across it before. The explaining time took longer than the time spent talking and generating ideas." (FBE student)

(b) Improvements

Most changes to the courses have been quiet subtle

- instead of a studio and a workshop we now



have a studio, a design development studio/workshop and a construction workshop

- We run a 'Team Building and Communication' workshop at the beginning of the design studio, which is facilitated by a consultant we will extend that workshop to all studios and workshops and add 2 more 'Ethics in a Multi-disciplinary Environment' and 'Sustainability'. Our client base and projects has changed considerably so we need to stay in touch with those changes.
- Our assessment changes in relation to the project we are doing and the stage
- Students doing the Workshop organize and run 'bonding' sessions eg Rock climbing
- We intend to bring in more specialist speakers in during all phases of the project to support student research and learning
- We are starting to induct tutors in to the program but this needs more development

Guidance for colleagues

- trust the students
- empower the students to 'own' a free running course and be responsible for the outcomes
- expect the students to be successful and they will be
- a project like Project X³ requires a lot of facilitating and encouraging feedback on a regular basis
- think about the big picture
- more formal research to verify and test observations.

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LSAA 2007 Conference - Lightweight Architecture Stretching Our Boundaries Internationally

More information

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