CONSTRUCTING A PRACTISE: MOBILISING DESIGN STUDENTS INTO LEARNING

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ABSTRACT

Within a tertiary educational setting, designing built form for architectural and design students usually begins with an abstract idea which is progressively developed through a series of models and drawings. The success and mistakes of these micro scaled outcomes remain within the inked lines of the drawing which are graded, archived and never tested.

However, there are obvious benefits for actual full scale built projects which engage students in a range of contexts, cultures, disciplines, professionals, industry, staff and community groups where they develop design, construction and communication skills which intellectually and physically interrogates every design decision.

This paper describes and illustrates the process and outcomes of a $300,000 trans-disciplinary experiential teaching and learning project for the design and construction of 3 multi-function mobile studio and exhibition units which will facilitate the School's expanding off-campus, hands-on community engagement program that provide settings for responsive educational experiences.

Key words: community engagement, design, construction

INTRODUCTION

Architecture and design marries scientific rationalisation with creative reasoning and couples measurable, rational and objective outcomes with imagination and subjectivity. If design education is to provide a foundation that links theory with practise and ideally replicates professional practise with clients, sites and projects, then the nature of design pedagogy must move outside the boundaries of campuses and past hypothetical propositions.

This paper describes a trans-disciplinary experiential project that will liberate South Australian art, architecture and design students from a city campus and situate them into ordinary and extraordinary environments and then into the realms of communities and clients, then jurisdictions of industry and government in a better attempt to replicate professional practise and provide applied and germane lifelong learning experiences.

It will outline the progression and outcomes of a large scale collaborative project to design and construct 3 multi-function mobile spaces to facilitate student engagement programs. The paper will describe the process that instigated the project and establish why these pods are critical to design education in the context of the Schools expanding community engagement program that empowers and builds capacity for disadvantaged communities.

THE SITUATUONAL CONTEXT

The South Australian populous largely enjoys an urban existence; however desert comprises 60% of its land base. These vast areas are sparsely populated and support small isolated mining centres and aboriginal communities in stunningly beautiful yet harsh environments. Due to politics, isolation and economic factors, these socially and culturally distinctive communities are often disadvantaged. As a consequence a number community based projects arise for art architecture and design students to engage with these groups but without adequate onsite facilities and resources it is difficult to facilitate any meaningful and long term engagement and hands-on experience based design outcomes. Further, within tertiary education, limitations on technical, physical and financial resources, timetabling and curricula commonly work against taking a project beyond the drawing and into these quintessential environments and immersion into different socio and indigenous cultures.

THE EDUCATIONAL CONTEXT

Experiential learning is a fundamental precept in architecture and design education. While practise based learning is mandatory in some of the School's programs and encouraged in others, student learning activities are substantially hands-on learning pursuits. Students study on campus in studios and digital labs undertaking problem solving exercises employing drawing, modelling and digital skills to produce sets of schematic and documentation drawings. Design responses cannot be tested against the critical pragmatics of occupation, cultural sensitivities or budgets. Yet the fundamental purpose of architecture and design is that it must function on a number of levels and for a number of different user groups (Lawrence and Cys, 2009).

Working with community and industry groups on actual sites while considering climate, topography, building codes, resources and existing infrastructure offers a perfect scenario for experiential learning that privileges all participating parties: (Figure 1). 'Community engagement is about learning and exchanging knowledge, identifying priorities and possibilities, making decisions, and making things happen.' (Beeck, Smith, Lommerse and Metcalfe 2011) Client or community based projects can also contribute to acceptance and understanding of the value of design research by industry.

Figure 1: Camp Coorong Ngarrindjeri Community

However, for an educational design project to move from concept to construction with its inherent complexities of scale, budget and semester based timeframes make such projects economically and physically unviable. 'The quality of the student experience requires holistic integration with all the key players from the academic community and support services working together to facilitate both extra-curricular and curricular learning. Therefore, if community engagement and extra-curricular activity are important for student personal development there is a need for academic/student services collaboration to facilitate opportunities' (Scott 2004). Therefore, realisation of built projects requires not only expert staff skill base but a genuine philosophical and financial commitment from the institution.

THE PROJECT

The University of South Australia (UniSA) received an Australian Federal Government Learning and Teaching Performance Fund to implement a new teaching and learning framework so that 'from 2010 onwards approximately one third of all learning experiences in all programs at this institution will be related to any combination of the three elements of experiential learning: institutional/practise based learning, the teaching research nexus, and community/service learning.' The initiative accords with Rameley (2005) who claims 'To undertake genuine engagement, an institution must be willing to open itself up to the possibility that it, too, will change and learn from the experience.' It continues to align with the university's 2013-2018 strategic plan to provide an 'outstanding student experience' and to build 'industry and end-user informed research, supporting an industry-relevant curriculum' and 'engagement with society beyond the classroom.' As described by Cleary and Skaines (2005) 'Research has conclusively shown that the most important factor in student learning and personal development at university

is student engagement, the active involvement, commitment and sense of belonging that dictates the time and effort students devote to educationally purposeful activities'.

The project consisted of 3 stages. Stage one measured each Schools overall teaching performance. This was achieved through a Program Review team evaluating the capacity, constraints and financial viability of every School in the university. Stage two described to what extent the three elements of experiential learning were realised in the courses at each School and the stage three requested each School to put forward an innovative teaching and learning project proposal which addressed the identified areas of weakness from the stage two investigations.

This paper will briefly outline stage two project conclusions in order to frame, describe and illustrate the stage three project and outcomes to date. It will contextualise the deployment of these pods to facilitate the Schools community engagement program.

STAGE 2

In the research and considerable consultative process of this project, space was identified as hindering growth in the School's desire to recreate professional working studio environments. The commissioned STEP 2010 research report undertaken by Dr. Brigitte Jolly recommended the School consider how it could utilize its staff expertise in more innovative ways and institute collaborations in other areas. It also identified the need for diversification with new product development, post graduate training areas and targeting more diverse markets. Critically to the proposal it acknowledged that nearly all academic staff was once in professional practice and aspires to, or maintains professional relevance by continuing to practise design.

The report and current research acknowledges the concept of studio as well as the criticality of well-equipped studio facilities as fundamental to design education. Research identifies that although the educational studio pedagogically and physically attempts to emulate practise, the actual nature of studio could better mirror the studios of commercial design practises which are the ultimate destination of our design graduates. Reduced class sizes; dedicated studios and improved teaching environments were also identified in the report as 'necessary' factors that 'attract' students to work effectively on campus. Additionally, 'Cross-studio collaboration appears to be emerging as a trend, and is regarded by some [interviewed practitioners] as imperative to achieve a commercial and competitive advantage…client participation appears to be another emerging trend in industry studio, with the client not simply a consumer but integral to the creative process' (McWhinnie, Peterson, Lawrence and Arnold 2012).

The main recommendation of the stage 2 report (Jolly 2008) was that 'service learning opportunities are frequently hindered by the time-table' staff desired 'any increase of time dedicated to students service-learning together with…the development of the intended skills and knowledge.' It reported 'staff would like to integrate service learning and widen the sources for it'. The report exposed the aspiration to simulate the professional studio through collaborative, multi-disciplinary community based projects while applying staffs practise expertise in experiential and innovative ways. Further, it acknowledged that existing space constraints on campus impeded

initiatives and opportunities to be developed and undertaken and off campus teaching and learning opportunities were often declined or limited in capacity due to a lack of suitable facilities for community consultation and on site projects including built works.

The constitution of the School's design programs enjoy a similar structure where theory and research, technology, communication and professional studies are applied to design projects and empirical learning and community engagement is philosophically fundamental to the School's teaching and learning strategy. This situation accords with Ramaley's (2005) qualitative view on engagement where she states, 'Engagement refers to an educational or research initiative conducted through some form of partnership... characterized by shared goals, a shared agenda …meaningful both to the university and to the community participants, and some pooling or leveraging of university resources...To be successful, partnerships must build on the strengths of the participants and there must be reasonable complementarity of what each can contribute to the overall goals of the collaboration.'

STAGE 3

Academic staff in the School developed a proposal that would enhance the curriculum as a complimentary sustainable experiential learning program. The aim was to build upon teaching and learning strengths across the School and aspirations identified in the report to distinguish the School's teaching practises nationally and internationally and progress the School in both education and design. The purpose of the proposal was to build capacity both within the School and externally within communities while providing an industry relevant teaching and learning paradigm.

Through an extensive consultative process with every academic, the School chose to expand design build projects in order to increase the capacity to engage students with community focussed projects in this initiative. With Federal Government funding the University provided a total of $319,000 to the School to enable students to design and construct 3 portable studio units to be employed for a variety of off campus activities. These units will be transported across Australia on a truck with a hydraulic lift which was also included in the funding. Named the Mobile Art Architecture and Design Spaces (MAADS), the proposal strategically builds upon the School's 25 year history of design and construction projects facilitated through its Student Design Build program which has produced multi award-winning buildings in remote locations around Australia: (Figures 2 and 3).

Figure 2: Patjarr Art Centre Gibson Desert 2003 Figure 3: Mt Franklin Visitors Centre ACT 2006

In doing so, facilities for on-site activities, exhibitions, meetings and project work were required to support staff and students to engage with local groups, industry and government in an appropriate, practical and immediate setting.

The proposed units are intended to be an innovative response to alternative studio spaces which have the necessary equipment and technologies to support a range of design, consultancy and building activities providing different learning environments both on and off campus and models for adaptable multi-purpose educational facilities. Additionally, they are aimed at accommodating and facilitating the School's Match Studio community engagement projects and existing collaborations with research groups in other Schools at UniSA. The project accords with Ernest Boyer (1990) who translated the constricting and rigid academic silos of research, teaching, and service into the more nuanced and interactive domains of discovery, teaching, engagement (Carnegie1997), and integration.

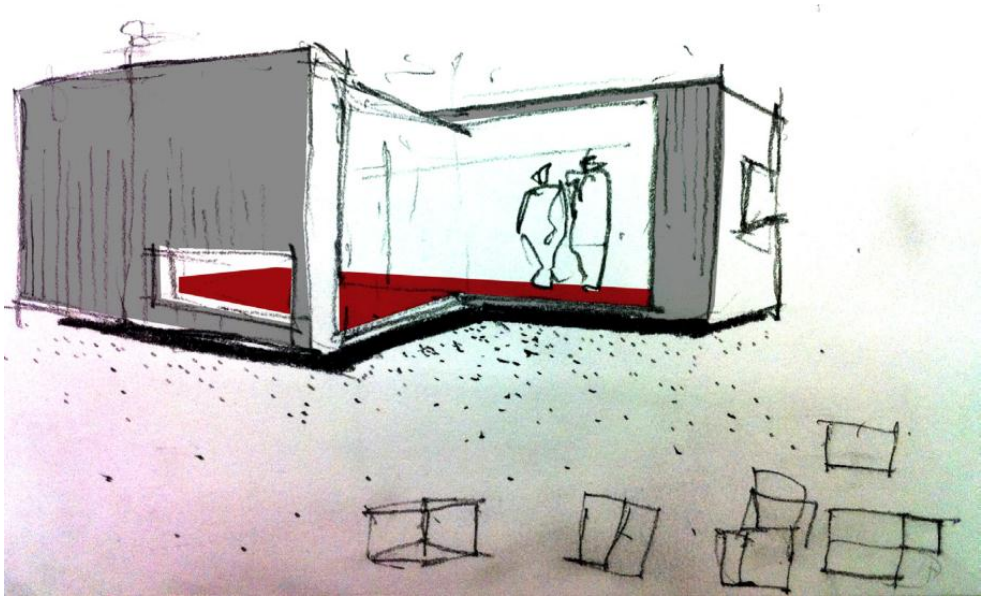

Figure 4: MAADS conceptual designs Jack Saunders 2010

PROCESS

The MAADS project commenced in 2009 with the initial design stages involving collaborative studios at 3rd year level and subsequent design studios and workshops involving over 200 students from 2nd to 5th year architecture, interior architecture, industrial design and engineering disciplines.

Students were required to develop 3 design briefs for mobile unit: a site office to operate in varying Australian environments; an equipped studio pod for 20 students and an exhibition space for community, school and university activities. Expert consultants and engineers were contracted to advise students on specific technical issues.

The design, documentation and fabrication of these units have been undertaken in a number of successive courses involving conceptual design: (Figure 4), design development: (Figure 7) documentation: (Figure 4) and prototyping through a rationalisation of previous designs and elements.

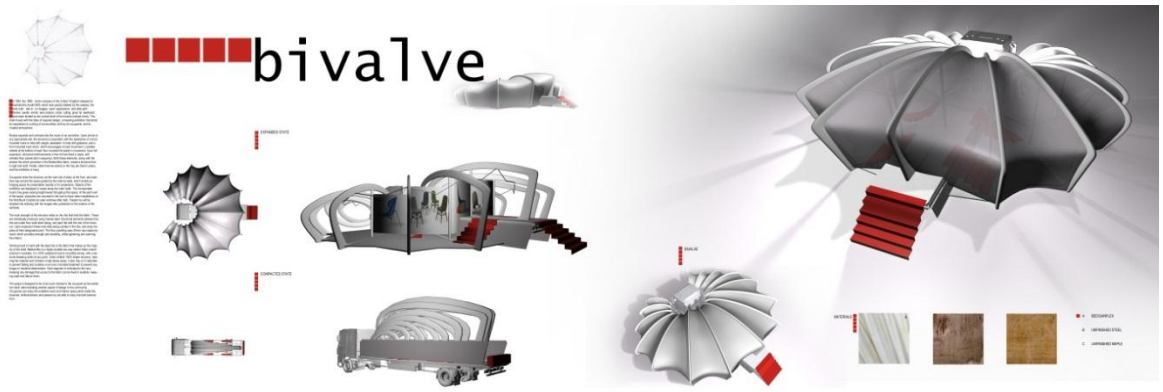

Figure 5: MAADS conceptual design Daniel Cadwallader 2009

Preliminary explorations focussed on expanding forms: (Figure 5) and numerous facilities planning scenarios. These were highly conceptual and established a foundation for the following design development stages where designs progressed focussing on pragmatic structural criteria including material and weight. The final designs realised expandable modularised structures employing water tanks as weighting devices and extendable canvas canopies. The 'site office' pod was designed to be the main unit to service both the learning and exhibition pods and houses all functional amenities such as power, water and storage. A post graduate visual communication student was contracted to design distinctive branding for both the units and truck.

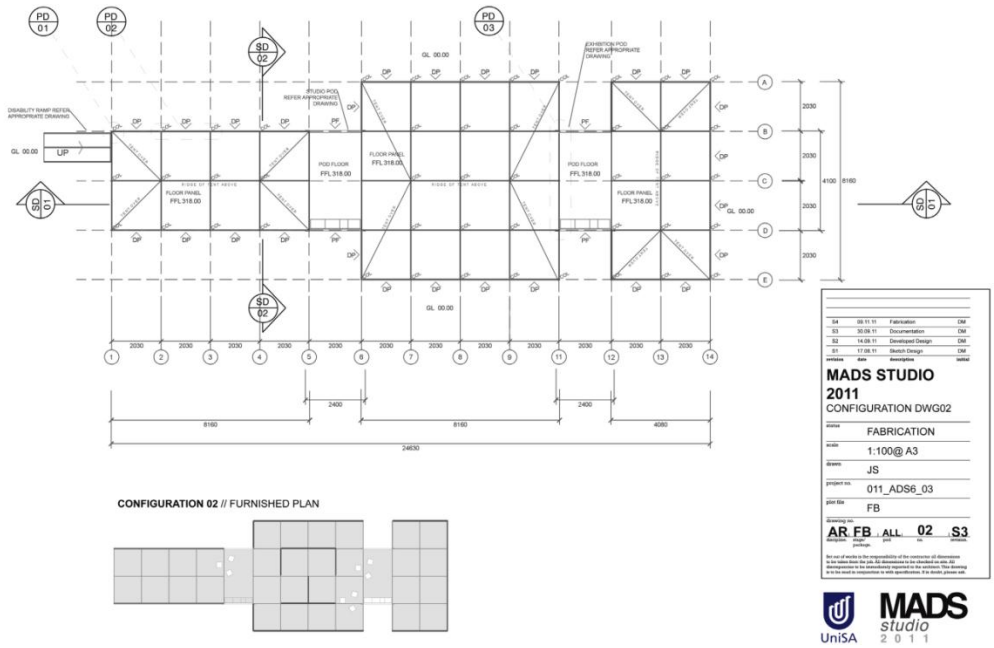

Figure 6: MAADS documentation drawings Jack Saunders 2011

Each unit had to be sufficiently adaptable to conduct one or multiple educational activities independently or concurrently. Students had to extensively research, test and apply materials, technologies and fabrication processes suitable for transportable modular units in consideration of climatic variables, loading and offloading, weight, storage and security. In construction phases students are responsible for all material selections and purchases, fabrication processes and internal fit out. As the units have to meet necessary and often stringent building, safety and transport codes, the design documentation and construction processes inherently provide deep learning experiences that do not exist in hypothetical design projects. Students develop and apply management skills through the coordination of the entire project from concept to completion.

PRODUCTION

In 2011, the third stage commenced with students working on the construction of these units in 2 week intensive sessions in the School's workshop during non-core teaching periods up until the proposed completion date of late 2014 staged for all 3 units. This comprises approximately 32 weeks of concentrated building time with students working in multi-disciplinary teams developing workshop skills in the design; fabrication and application of contemporary materials and technologies; project management; cost estimations and material take-offs and purchasing. Importantly, the process of handing-over documentation and schedules to subsequent groups safeguarded a cumulative progression ensuring project consistency and coherency. As a continuous teaching and learning program such complexities do not fit easily within the curriculum but made possible with exceptional on campus workshop facilities, intensive teaching models and temperate staff with expertise in design and construction.

Figure 7: MAADS design proposal Jack Saunders 2011

CONSTRUCTING THE PRACTISE

A post mortem on the learning outcomes of the trans-disciplinary studios revealed that mistakes made in previous workshop sessions were inherited by the next group and ownership of designs and problems had to be negotiated and apportioned. This situation unambiguously ascertained the strengths and weaknesses of student cooperation and problem solving abilities – and attaining resolution could be protracted. Conversely, this process provided an assemblage of collaborative ideas and distinct ranges of ability and purpose with a collective and common objective not customary in conventional studio culture. It is this theory/practise nexus which drives the educational motive. As Ramaley (2005) states: 'Common forms of engaged learning are service-learning and problem-based learning, both utilizing community issues as a starting point for accomplishing educational goals. Engagement can be achieved through community-university alliances and partnerships and can support any combination of scholarly activity including discovery, integration and interpretation, and application.'

The nearly completed units are in demand for use in for a range of off campus projects and consultancies. The healthcare and welfare partnerships through Match Studio and the Student Design Build program are engaging students with communities to purpose design and build facilities in local, regional and off-shore areas including the Adelaide Hills and Kangaroo Island. The benefits for highly visible and tailored working facilities for consultation and project work off campus are abundant. 'Not only do these units enable easy and immediate engagement with industry and the wider community, they also demonstrate to the community the nature of architecture and design practise…[and] will allow students to directly engage with the site, consult, discuss, present and exhibit their design ideas with relevant parties. This process of active

community engagement on site [visibly] reinforces the School's teaching, research and building capabilities locally, nationally and internationally (Cys and Lawrence 2009).

Jill Franz (2002) describes the advantages of real sites and projects as a mechanism for teaching social responsibility and professional ethics and a means of becoming more responsible through design practise: (Figures 8 and 9). This is '…an opportunity for [students] to explore and challenge their own underlying values and preconceptions by considering uses that are viewed as marginal by some groups in society and that may also be held as taboo by themselves.'

Figures 8 and 9: Student Design and Construction Project: Mimili, Anangu Pitjanjatjara Yankunytjajara Lands, SA 2010,2011

CONCLUSION

The MAADS project positions a pedagogical model in experiential learning from conception to occupation – effectively resolving every aspect of the design equation and enabling students to 'tangibly experiment' (Morris 2009) and 'find solutions that may have no precedent from their realms of either experience or study' (Lawrence, Cys 2009). By implication, students take ownership of the project not as an individual pursuit but one as a shared stakeholder where every decision ultimately has some implication on the outcome. The significance of this project shares common characteristics with engaged institutions and by association engaged students as adapted from (Ramaley 2002, Bringle & Hatcher 2001 and Holland 2001) where students 'think carefully about the consequences of all of decisions… are involved in continuous, purposeful and authentic ways and listen carefully to what community members have to say... and where the curriculum contains a variety of ways for students to learn in ways that engage them in community concerns and honours and makes visible its engagement work, both internally and externally.'

The manifestation of a design project and working with communities to effectually make a difference to their quality of life are possibly the best and most empowering learning outcomes for any student and all those associated. Geoff Scott (2004) states that, 'A key influence on motivation is the peer group and the collegial networks in which university staff are engaged. Just as the peer group for School or university students profoundly influences their motivation to engage in learning, so too does the peer group influence staff engagement in the learning necessary to put desired changes into practise.'

The energy created through service learning is generated from working with a variety of groups in their local environments where students broaden their perspectives and gather cultural, generational and socially immersive experiences. In the School's recent history these include 2 remote aboriginal communities; national park centres, school facilities and work with healthcare sectors including the aged and youth. A current student design and construction project integrates cultural specificities and vernacular building techniques for eco tourist accommodation facilities in Vanuatu. This long term project aims to build capacity for this community by providing income to educate the community's children beyond primary school and engage the whole community in the operation of the facility: (Figure 10). This initiative in social change and cultural investment accords with Smith, Tiwari and Lommerse (2014) who recognise that in 'the development of civic engagement, trust and reciprocity…the greater the social capital, the more potential there is for improving community capacity…[helping] community members to cope with adversity and limitations, as well as fostering a sense of place.'

Figure 10: Pt Resolution Project Tanna Island Vanuatu 2012

When students experience the people and environments in site specific projects they have the opportunity to contextualise their own situations and prepare themselves for the manifold conditions that arise in professional practise. The same stimulus operates for academic staff in reinvigorating their teaching and research practises. David Morris who runs the Student Design Build program at UniSA recognises that this process enables staff 'to be less prescriptive in the definition of both parameters in searching for the right answer and in evaluating the solution itself' (Morris 2009). Commonly students in our architecture and design programs are driven by the aspiration to practise. They are educated by academics who themselves are endeavouring to maintain a practice base, so the aim to institute a teaching research nexus becomes more relevant, tangible and transparent with these projects. Students have identified that research for

them means 'finding out about information relevant to their design solution...and conceptualising a hypothesis or research statement, identifying relevant theories...and discovering different views in order...to articulate their own views and ideas' (Marshall and Demirbilek 2007). 'How knowledge is gained, and for which end-purpose, perhaps are the crux to useful meanings of 'research'' (Jolly 2008). Certainly there is a connectedness between research and teaching in the MAADS project curriculum. 'There is a growing awareness of the need to connect student to the research and researchers of their chosen discipline as a way of engaging them within a scholarly community that extends well beyond the traditional boundaries of classroom and institution.' (Krause 2006).

The MAADS project aims to foster and embed experiential learning in both production and pursuit and will facilitate future on site community engagement projects which have not been able to gain continuity and momentum without the appropriate custom designed resources. These projects set up a dichotomous and mutually beneficial situation wherein 'responsibilities and risks are shared, mutual accountability emerges, and partnerships are created that contribute to bring lasting change.' (Smith, Tiwani and Lommerse 2014). Where change management is an integral aspect of architecture and design disciplines, these are applicable and empowering pedagogies. The challenges and stimuli that come from working with community groups by learning and applying knowledge recurrently are intensely memorable and beneficial: (Figure 11). Such enduring lessons are not practicably replicated though rarefied cyber interface or secreted within the hallowed halls of learning. They demand a far greater commitment and effort than conventional courses yet are unanimously endorsed through student's optimistic teaching and learning evaluations. Students positively affirm their ability to 'do' design through attaining complex constructed outcomes, but realise the impact and contribution they make on the lives of others as more sustainable and profound.

Figure 11: Student Design and Construction Project: Mimili, APY Lands SA 2010.

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