

**SKIN SURFACE + BONE/FRAME**  
Design through Metaphor and Scale  
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**Abstract:**

The design studio is the heart of Interior Architecture education. It is the spring board for future designers and is the main forum for creative exploration, critical thinking, discussion, development and reflection. Our future designers need to be disciplined, analytical yet flexible thinkers, who are able to address and resolve new and complex problems. This paper reviews the progression and development of an experimental design studio over three years. The studio was established to gauge students' design understanding through drawing and modelling, thereby providing a common tool for discussion. This process raised a number of concerns relating to their understanding of scale, detail and human occupation. Therefore the studio approach was revised to incorporate full-scale sectional models constructed from light-weight materials. The students were inspired to build on their knowledge and creative thinking abilities through a series of explorative exercises and modelling, They thus achieved a greater understanding of scale, detail and design tectonics.

The learning experience of students undertaking this studio was enabled and guided by teachers experienced in both university teaching and creative practice, as strategic teaching is central to the creative development process. Through an exploration of the evolving studio process, this paper will show the effectiveness of a pedagogical approach that enables students to bring ideas to life by combining drawing and modelling with full-scale three-dimensional design models. This approach and practice enables students to develop their strengths as designers, as they inhabit their designs and appreciate the human scale.

**Keywords:** Interior Design, Experimental Design Studio, Design Methodologies,



## **Introduction**

Interior Architecture is about resolving problems by thinking creatively and critically. This paper presents a case study of the initiatives of an Experimental Design Studio for third year, first semester interior architecture students that encouraged enquiry and inspired originality, while avoiding the risk of mediocrity, one-line statements and eclectic solutions. The studio environment fostered self-discovery and synthesis of information, and placed the responsibility of learning with the students by giving them time to explore in a supportive learning environment. The studio was initially established to gauge students' design understanding through drawing and modelling, thereby providing a common tool for discussion. This then raised a series of concerns relating to their understanding of scale, detail and human occupation. Therefore the studio approach was revised to incorporate full-scale sectional models constructed from light-weight materials. This enabled students to better understand issues of scale, detail and tectonics and inspired students to build on their knowledge and creative thinking abilities.

The goal was to facilitate a studio environment that promoted critical thinking while encouraging students to explore and analyse various issues and theories. Thereby their ability to build a substantiated case for an interior design solution was enhanced. Strategic teaching is central to the creative development process. The driving educational belief was that by bringing ideas to life through working with full-scale three-dimensional designs, students were able to increase their commitment to working the process. This attitude and practice facilitated their development as innovative designers.

Through a combination of pragmatic tasks, including writing, developing design briefs, visual tasks, and evidence-gathering and design analysis through photographic, modelling and diagramming exercises, students were encouraged to think outside and beyond the 'normal' realm of design practice. They were also exposed to a range of techniques to inspire and drive their projects further than had previously been seen at this level. Many different viewpoints were revealed through their exposure to others' techniques and ways of making. By harnessing these new views, students were led to greater understanding and were better able to develop their own strengths as tools for creating design solutions, as well as to recognise and address their weaknesses.

## **Contextualising the discussion**

As design educators we attempt to break down complex concepts and activities involved in designing in an effort to describe specific qualities and characteristics of design through critical thought and application. The process through which a work of design comes into existence involves numerous phases of development, each of which may benefit from working in different modes of creation and evaluation.

In the design studio, students express and explore ideas, generate and evaluate alternatives, and ultimately make decisions and take action. The design studio provides a venue for students to engage in conversations, dialogues and collaboration related to open-ended problems, and it encourages speculative exploration. Students make external representations and reason with these



representations to inquire, analyse and test hypotheses about the designs they represent. In the highly social environment of the design studio, while seeing design as a process of creativity in a contextual framework, students learn to communicate, to critique and to respond to criticism, and to collaborate.<sup>1</sup>

### The Journey: PROCESS

#### Journey #1 - 2006

In 2006 an experimental design studio titled *Raw + Cooked* was initiated. The studio was established as a reaction to the growing expectation that students' work should reflect the professional standards of practice. Prior to this innovation, the studio resulted in clever computer software presentations but failed to address the critical aspects of interior design and the occupation of space. It was felt that the detailed critical examination of design through questioning and experimentation was being overlooked as students hurried to achieve the time-consuming presentation of their projects. There was a gap between what students thought they were designing and what they understood about what they actually created. Indeed it seemed that the more specific computer programs became, the less convinced teaching staff were that students understood what they had created. Essentially, they were producing wonderful images, but had little idea as to how these translated in scale and detail.

The project explored the metaphor of 'Raw and Cooked', examining the physical components of cooking (the ingredients) and how these altered through a series of alchemical processes. The designer, like the chef, begins with a palette of materials that are built upon and refined through the design application. As the cooking process is familiar to the student, a better understanding of the design process was established [See Figure 1]. A detailed explanation of the processes and outcomes are described in Spanbroek (2007).<sup>2</sup>

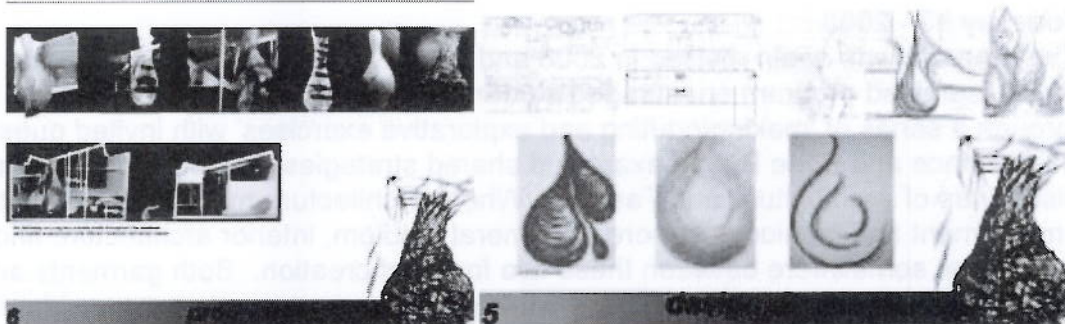


Figure 1 Jenna Hogan 3<sup>rd</sup> year design unit Student Work 2006

#### Journey #2 - 2007

Architectural drawings are drawn at a reduced scale, and it is assumed that Architectural education addresses this issue of 'scale' through design discussion and student work. The studio was revised in 2007 to better address students' understanding of how a drawing translated three-dimensionally. Students were encouraged to model their ideas initially, and once they fully comprehended their



design intention, were asked to translate these designs into two-dimensional drawings.

Students were then guided to think critically through the making of a series of models, reflecting at each stage the issues of occupation, cross-cultural issues in design, physical, mental and spiritual issues of place, and tectonics and their integration throughout design. However, these models are built at a variety of reduced scale ratios, and although they reflect form, plan and section, they rely on the students' creative imagination to occupy the space and address the human scale. The reality of this understanding occurs once the student is working in practice and generally relies on exposure to and experiences with the site before the young designer truly appreciates this issue of scale. As students, however, they are unable to address the full scale and design details and as a result their projects are unresolved, failing to satisfactorily reflect the detail of the design project [see Figure 2].

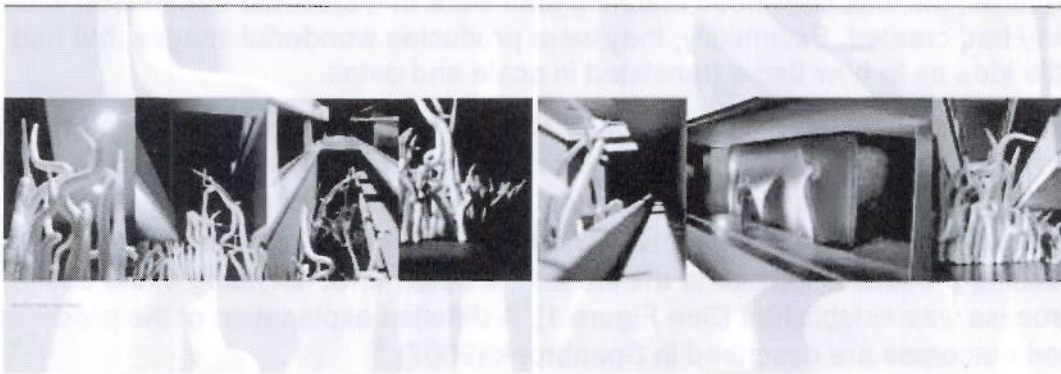


Figure 2 Michelle Salomone 3<sup>rd</sup> Year Design Unit Student Work 2007

### **Journey #3 - 2008**

The program was again revised in 2008 and titled Skin/Surface + Bone/Frame. This assembled program encouraged students to develop their modelling skills through a series of 'making/crafting and explorative exercises' with invited guests. Skin/surface and Bone Frame examined shared strategies and techniques of the disciplines of Architecture and Fashion. Where architecture makes a fixed built environment and fashion is a more ephemeral medium, interior architecture finds its position somewhere between these two forms of creation. Both garments and buildings protect and shelter the body while providing a means to express identity. While the earliest examples of clothing and buildings were not "designed" but rather devised out of necessity, contemporary practitioners in both fields have continued to address the human imperative for shelter in ingenious ways.<sup>3</sup> The studio structure encouraged the use of guest lecturers and artists, allowing exposure to other disciplines. This studio will be explored through the design process work, illustrating the development of one student's work throughout the semester project. [see Images 3 -11 and 15-16].

### **Learning methodology**



The third year Interior Architecture design unit in 2008 was framed as a collaborative experimental studio where students developed their thinking with a series of explorative exercises through modelling. With assistance from guest artists, students were able to explore a variety of approaches to their design themes. For example, folding paper with Thurlie Wright, bending bamboo with Sarah Chescoe, and experiencing the 'narrative' of their designs with Nicole Smart. The aim of the studio was to develop an understanding of a designed object at full scale and in this way to appreciate the detail.

Students were encouraged to independently develop their own design brief for either a Medical Centre or a Health Centre within the existing Architecture building on the University campus. The project aimed to encourage students to think critically at all stages of the design process, to develop the ability to question and challenge accepted norms, to master the integration of theory, materiality and design issues in interior environments, and to develop an understanding of scale. Site choice for the project was a very deliberate decision as it allowed students to move throughout the building photographing, measuring, checking existing details, gaining a better understanding of their scale within the site and exploring the materiality and the existing quality of light within their site. Their developed design brief evolved throughout the project through discussion and observations within the studio. Students were required to further investigate their selected building typology in regard to facilities, function and requirements.

Students' creative and critical thinking abilities were stimulated through model making and drawings, exploring the themes of Fashion and Architecture as a design metaphor. Students explored the process of 'deconstructing and reconstructing' a found object, initially capturing these processes in a series of quick sketch models. These quick models provide the students with the tools to examine the qualities their models create and give them a starting point to discuss and explore possible design directions for occupation.

### **Critical and lateral thinking**

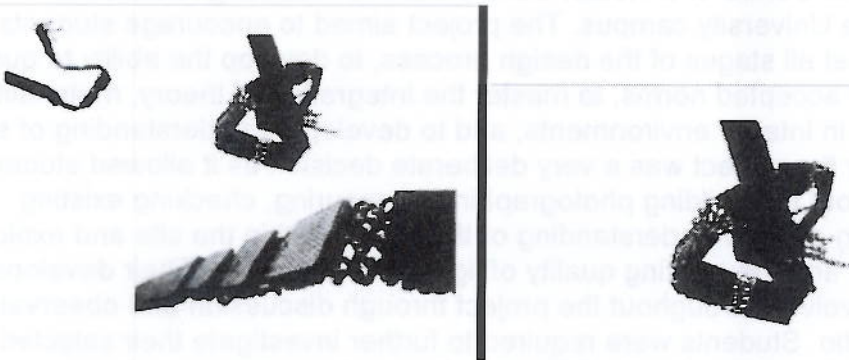
The major component of critical thinking includes the thorough examination of a problem, resulting in a solution that is supported by education and theory. Measures one can take to analyse a design problem critically include differentiating between facts and values and between relevant and irrelevant information, determining the credibility of the source of information, and identifying logical fallacies. Such analysis evolves into a justification for an interior design solution.<sup>4</sup>

Effective critical thinking involves not only the building of competency in cognitive reasoning, but also the ability to translate competency into effective action. To think critically, one must have and own a willingness to be accountable for results. Good critical thinkers are skilful at analysing and evaluating information, reflecting on meaning, examining evidence and reasoning, and forming grounded assessments about facts harvested from observation, experience, cognitive reasoning, and/or communication. Those who become skilful at critical thinking are able to reach conclusions and develop solutions that generate new results. Students commenced the Skin/surface + Bone/Frame studio by undertaking a series of exercises. These were designed to encourage students to develop their

critical and lateral thinking skills through questioning, exploring and graphic examinations [See Figures 3 & 4] .

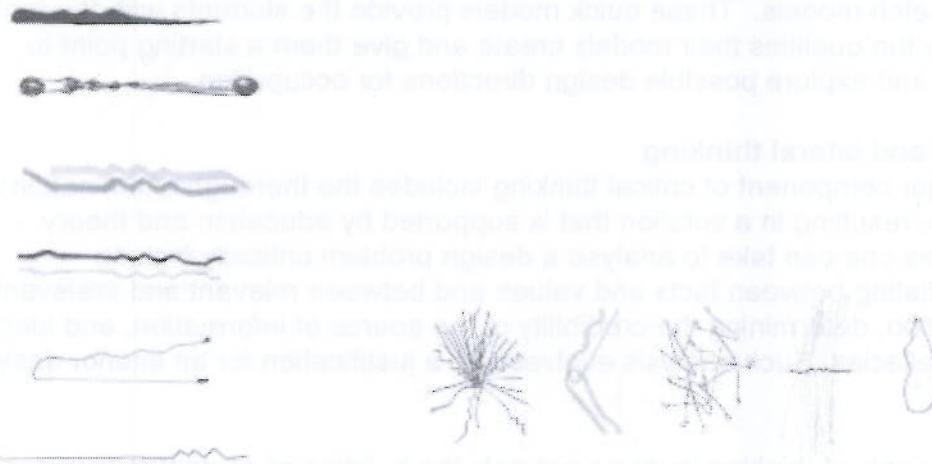
Week 1

In house exercise 1 – Deconstruct/Reconstruct Found Object – man made/natural



Deconstruction and reconstruction of man-made found object- CARPET  
Figure 3: Emily Durkan 3<sup>rd</sup> Year Design Student work 2008

In house exercise 2 – Describe found object through drawings /diagram



Exploration of found object through drawing-HAIR PIN  
Figure 4: Emily Durkan 3<sup>rd</sup> Year Design Student Work 2008

### The act of drawing

Sketching is an inseparable act for most design education methods. Sketches are essential representations for thinking, problem solving and communication in the design disciplines. Drawing is not only important as a vehicle for communication with others, but also the act of drawing actually helps designers see and



understand the forms they work with.<sup>5</sup> By sketching, students learn to think with drawings, develop their ideas and solve complex problems. Drawing is intimately bound with thinking. It is an essential tool for the designer; sketching is a type of modelling that helps the expression and the presentation of a designer's mental concepts [See Figures 5 & 6]<sup>6</sup>.

#### Week 2 - Exploration of Skin + Bone

In house exercise 3 – Graphically describe body systems through drawing

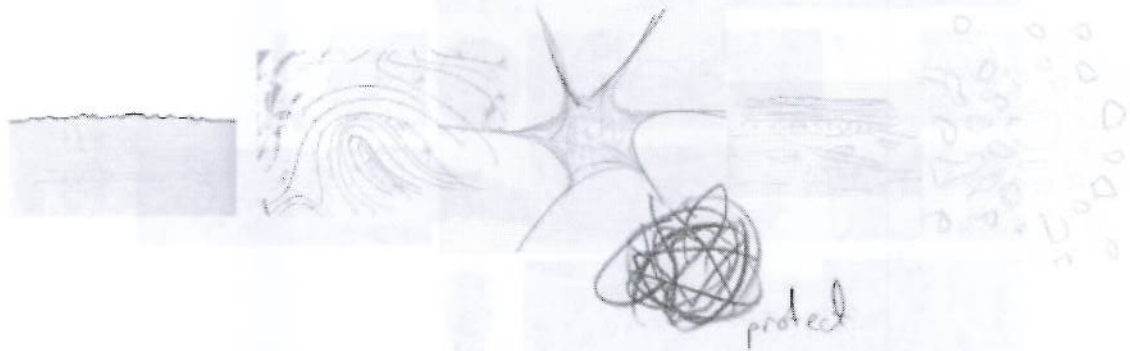


Figure 5: Emily Durkan 3<sup>rd</sup> Year Design Student Work 2008  
Exploration of body organ- SKIN

In house exercise 4 – Graphically deconstruct a garment in orderly/ diagrammatic way

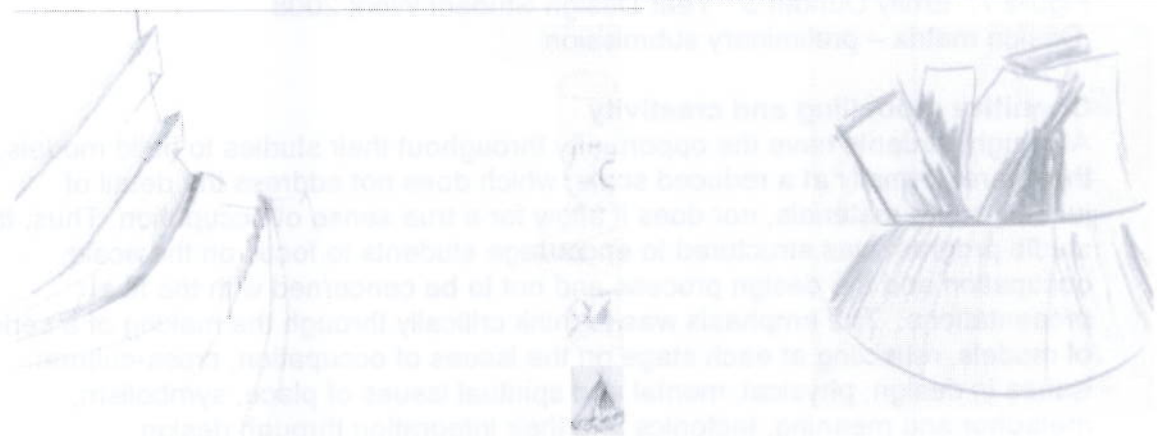


Figure 6: Emily Durkan 3<sup>rd</sup> Year Design Student Work 2008  
Deconstruction of garment through diagrams- SKIRT

Submit Design Matrix for Week 3



Figure 7: Emily Durkan 3<sup>rd</sup> Year Design Student Work 2008  
Design matrix – preliminary submission

### Cognitive modelling and creativity

Although students have the opportunity throughout their studies to build models, these are normally at a reduced scale, which does not address the detail of junctions and materials, nor does it allow for a true sense of occupation. Thus, the studio program was structured to encourage students to focus on the scale, occupation and the design process and not to be concerned with the final presentations. The emphasis was to think critically through the making of a series of models, reflecting at each stage on the issues of occupation, cross-cultural issues in design, physical, mental and spiritual issues of place, symbolism, metaphor and meaning, tectonics and their integration through design.

Conceptual modelling has the potential to provide an externalisation of a learner's cognitive modelling and it is through the relative accessibility of such concrete modelling that learners have access to their own 'thinking-in-action'.<sup>7</sup>

The following in-house exercises were set to encourage students to explore design opportunities through modelling key design matrix images. The design matrix is a grid format with a series of key images associated with relevant design-brief key texts such as light, shadow, patterning, texture, etc. Students



continue to refine their design matrix throughout their initial design investigations, as is evident in Figures 8, 9, 10 and 11.

#### Week 3 – Exploration of Surface + Frame

In house exercise 5 – Explore matrix key image in model form using card/paper

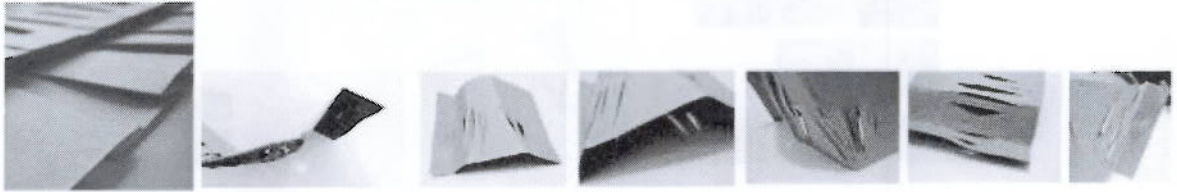


Figure 8: Emily Durkan 3<sup>rd</sup> Year Design Student Work 2008  
Exploration of matrix image in model form using card.

In house exercise 6 – Explore matrix key image in a material other than card/paper



Figure 9: Emily Durkan 3<sup>rd</sup> Year Design Student

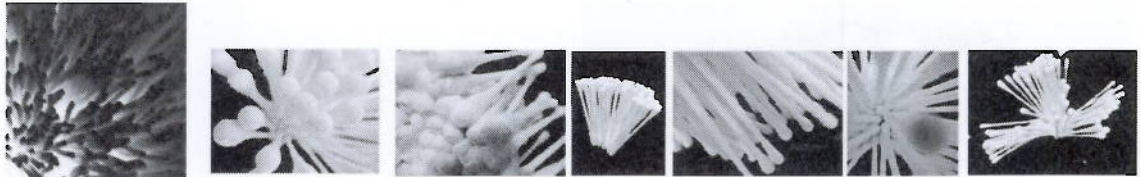
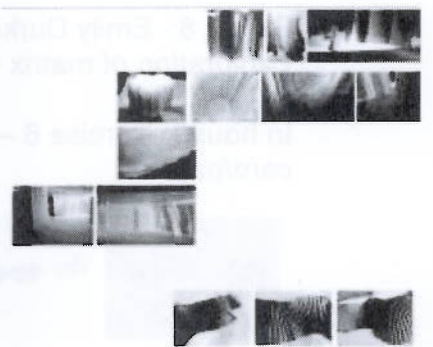
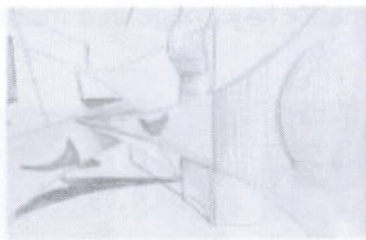
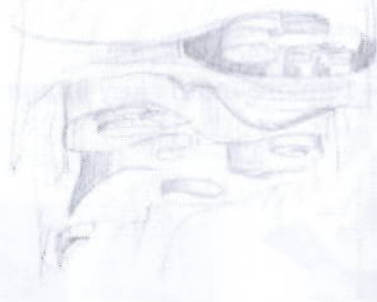
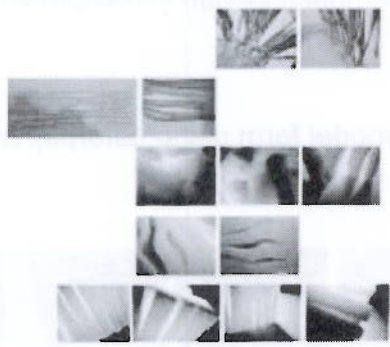


Figure 10: Emily Durkan 3<sup>rd</sup> Year Design Student Work 2008  
Exploration of matrix images in model form.

#### Week 4 – Conceptual Planning

In house exercise 7 – Select image from matrix and show how you may inhabit this space



Inhabitation of matrix image

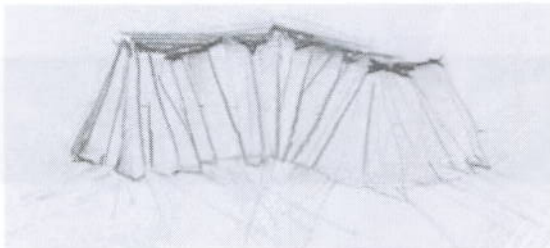


Figure 11: Emily Durkan 3<sup>rd</sup> Year Design Student Work 2008  
Drawings exploring filtration and folding



### Conceptual and concrete modelling

The semester was based on a series of in-house exercises that explored key topics including: lateral thinking; exploration of skin + bone; exploration of surface + frame; exploration of inhabitation and material development in relation to the design brief. Strategies were implemented to preserve traces of the design process of each student, through the visual tool of the 'design matrix' that was able to be edited and refined as the project developed. This also allowed for reflection by both staff and student to follow their own design progression and that of their colleagues through to the full scale model [see Figure 15].

Models act as representations and modification and development becomes possible due to the accessible model. As Parkinson (2007) suggests, at a concrete level models may provide opportunities to make tests to judge the effectiveness of an arrangement of parts or systems, and to assess the effects of interactions with the surroundings. The notion of modelling is explored in this studio from the perspective of conceptual and concrete representations. This paper argues that full-scale models address not only issues of scale, material and detail, but also of occupation. Three-dimensional modelling, no matter what scale, can act as a medium for cognitive growth and development [see Figures 12, 13 & 14].

### Week 11 – Design Development 3D

#### In house exercise 8 – Bamboo Modelling Workshop

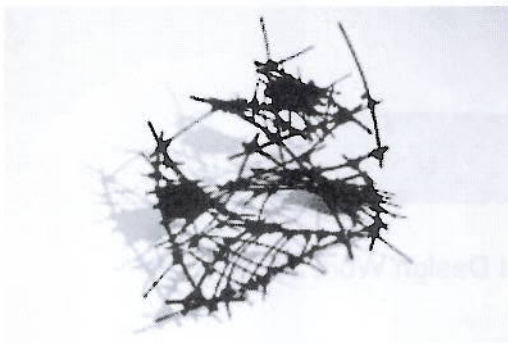


Figure 12

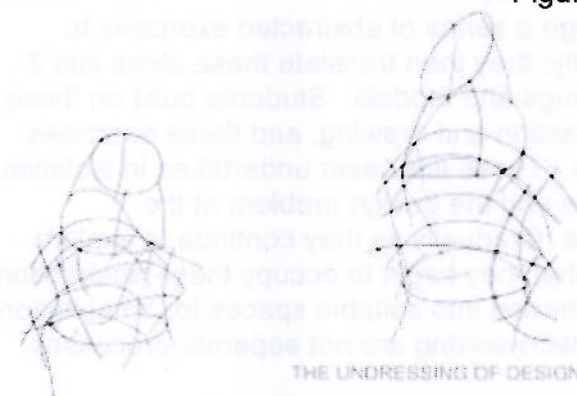


Figure 12 & 13 Cathy Greatrex: 3<sup>rd</sup> Year Design Student 2008



Figures 14: Bamboo Student Workshop 2008

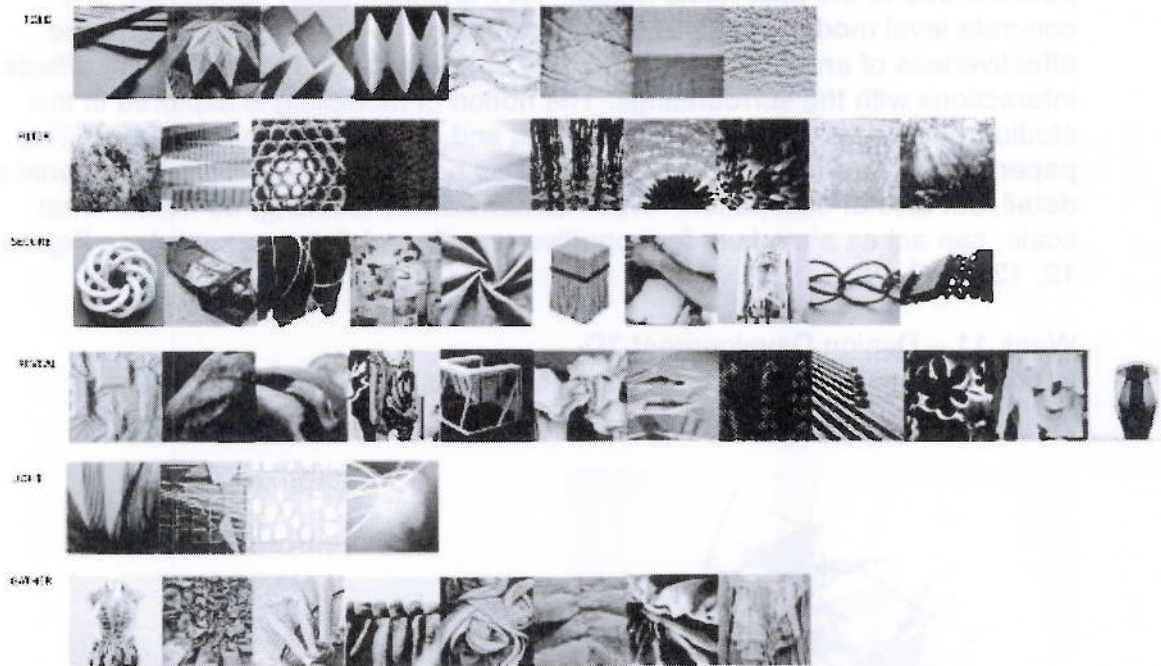


Figure 15: Emily Durkan 3<sup>rd</sup> Year Student Design Work 2008  
Design matrix –final submission

Design ideas are initially tested through a series of abstracted exercises to encourage the student to think laterally; they then translate these ideas into 2-dimensional and 3-dimensional drawings and models. Students build on these approaches through modelling, abstraction and drawing, and these exercises begin to inform their design approach. These are never undertaken in isolation, as the student is introduced to the site and the design problem at the commencement of their investigations. Gradually as they continue to explore ideas through abstractions they find that they begin to occupy these abstractions, that are then modelled, shaped and formed into suitable spaces for inhabitation. However, modelling, design and problem-solving are not separate processes, there are links between them.

Students were required to build an aspect of their design to full scale. Although the previous two studios held in 2006/07 were able to explore some of the issues



mentioned above, their ability to truly “experience” their designs had still not adequately been dealt with. It was felt that this full-scale concept would provide the additional element required to better address student’s inability to appreciate the impact of their designs [see Figure 16].

Modelling and design are intimately linked, since ‘design’ can be seen as a term involving the articulation of ideas to modelled formats. At first, when creativity has its greatest scope, designers generally use vague concepts, especially in the early phase of the design process and when crucial decisions are made. Such thinking is known as ‘cognitive modelling’, which construes sense data and constructs representations spatially and presentationally, rather than discursively and sequentially.<sup>8</sup>

Students were clear about their progress at all stages of the semester program; this clarity was gained through the ongoing development of their model work, which allowed for more effective studio discussions, critique and reviews of their process. There were no surprises or misconceptions; students accepted the grading system and stressed their enjoyment and learning achievements from the project at the conclusion of the semester.



Figure 16: Emily Durkan 3<sup>rd</sup> Year Design Student Work 2008



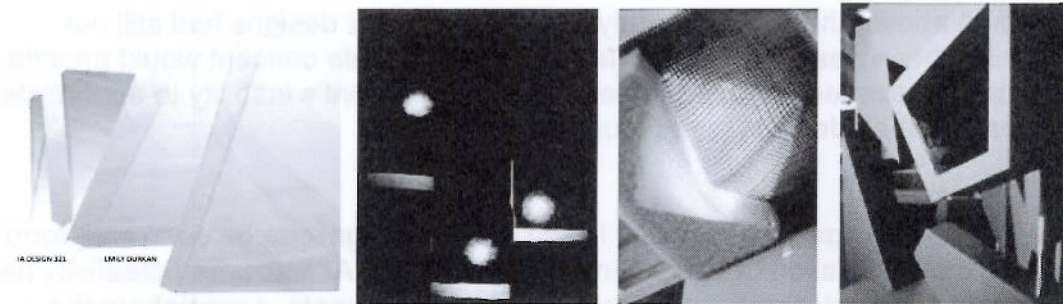


Figure 16: Emily Durkan, Kylie Frost, Lance McLeod, Sheridan Emby  
3<sup>rd</sup> Year Design Student Work 2008

Final submission – 1:1 model installation on site

### Reflection

At the end of the semester students achieved the following outcomes: the ability to develop a design project beyond the pragmatic; an ability to communicate a design intent reflecting an understanding of the magic and poetry of the environment and its impact on the occupant; and an ability to express the materiality and tectonics of an interior environment through drawing and models. Students were able to resolve design problems at an informed and creative level and were able to think critically and translate findings into project work. Prescribed outcomes for student work contradict empirical learning, where students learn through question, exploration and discovery. The danger with prescribed outcomes within a project brief is the amount of evidential output in relation to the learning achieved. Critical thinking processes involving not only the building of competency in cognitive reasoning, but also the ability to translate competency into effective action are important to the students' learning, but often in total contrast to the processes of a student submitting a minimal finished project. Minimal finished projects can be assessed to meet all the predetermined outcomes desirable within the university system. The critical thinking process will have enabled an enormous amount of learning within the exercises undertaken. This process is the valued component in developing thinkers who are skilful at analysing and evaluating information, reflecting on meaning, examining evidence and reasoning, and forming grounded assessments about facts collected from observation, experience, cognitive reasoning, and/or communication. All these abilities are absolutely important in the process of learning and building good design, but are not assessable unless reflected in the outcome of the work.

Again, it is through the recognition of each individual's strengths and weaknesses that guidance can be provided to each student. As previously mentioned, the flexible 'pass or fail' approach to assessment allows individuals to concentrate more on the overall outcome of their learning, rather than the specific marks they are allocated along their journey. Staff are guided by principles that recognise each student as having the ability to achieve amazing things, but this growth will only occur when they feel safe in a positive work environment.

Consequently, it is the coordinators' aim to look only for the strengths in their students, to hone in on them, and foster their pride in their own work. Once this has been achieved, time and experience has proven that students are then able to discuss and work on their weaknesses in a confident manner. Indeed,



knowledge production and its place in life-long learning suggests that education is more about making the most out of a situation on an individual personal level, than just completing set, highly structured tasks.

### **Concluding remarks**

This paper argues for a 'studio-based learning' approach in terms of the impact of design tools, especially sketching and concrete modelling, on the creativity or problem-solving capabilities of a student.

A brief overview of these results shows that the outcomes of an experimental teaching method were the understanding that students achieved about designing outside the computer, as well as an improved awareness of their own design process through 'making/exploring'. Students were able to realise the new possibilities given through exploration of process stages and to explore these from the very beginning of the design process. [To tie it all together, I think you need to mention the full-scale model method of teaching here as well.]

The case study presented in this paper shows that critical thinking in Interior Architecture students can be nurtured and taught through flexible time scheduling and exploration of design through staged process work. The challenge of this experimental pedagogic approach was to provide a studio environment that enhanced critical thinking results in an interactive learning environment. Students were able to actively participate in the learning process, creating full-scale design models within a dynamic educational environment. This studio approach has allowed students to step back from their work and truly question the design intention and its occupation. Where the focus was placed on the process, students were comfortable in questioning each stage of their design work, recognising that this was part of the process and not another interruption preventing them from completing their work. On more than one occasion, students found they had to revisit a particular design stage before their work could progress. Since this was an accepted part of the studio project, students were willing to revisit their design ideas and consider their approach from different perspectives.

The opportunity to explore and discuss design through modelling, drawing and discussion has proven to be very successful in this studio. Students have responded with positive feedback and staff have commented on the strength and quality of this cohort's design work in ongoing semesters. Although the exploration of the full-scale model may not work for all units, it afforded the students a new perspective on their designs and allowed them to better critique their work. It is important to note here that it is the focus on the process that benefits the student, and the learning that occurs within each stage and not the final outcome.

There are many answers to one set problem within design. The important aspect here is how the student is encouraged and allowed to explore. For creative design to be taught successfully, timeframes and structures must be more flexible in order to allow staff and students to develop creative and innovative design solutions.



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