Is there still value in teaching multidisciplinary basic design studios based on experimentation with materials?

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There is a constant pressure at the universities to teach more efficiently, reducing the length of study and producing ready to work graduates. In design courses around Australia there are also constant changes towards increasing the digitalisation and reducing the hours of studio teaching, while graduating students are expected to gain competences to work in their respective discipline. Specialisation represents an important aspect of the teaching curriculum. On the other hand, within the design profession, there is also a need for flexibility and collaboration. Design graduates are expected to constantly adapt their work in their professional life. Traditional art, architecture and design disciplines as we know them are being transformed, and our professions need to be able to adjust to all those fast changes. So how do we approach skill-based, specialised teaching having in mind the demand for flexible and unknown futures? Is there a still value in teaching multidisciplinary basic design studios?

This paper discusses multidisciplinary basic design courses, looking at pros and cons of specialisation and multidisciplinarity. We reflect on the history of basic design courses and use as case study a basic design unit we have developed at the University of Canberra, which includes architecture, industrial design, interior architecture and landscape architecture.

1. Introduction

In today's world of complex "wicked" problems (Buchanan, 1992), all professions, and most specifically the creative disciplines in Arts and Design, are in constant change and reinvention. Not only disciplines evolve, but also new design specialities are born with new technologies, and the boundaries between traditional disciplines increasingly change and blur. This context demands even more from young graduates to be innovative and adaptable, to collaborate, to be flexible and imaginative in order to be competitive at the market. Thus, as educators, we ask ourselves: how do we approach skill-based, specialised teaching having in mind the demand for flexible and unknown futures? Is there still a value in teaching multidisciplinary basic design studios based on traditional experimentation with materials?

It could be argued that studio-based teaching is still the best model for learning in the creative disciplines (Boyer and Mitgang, 1996, Yocom et al., 2012), and that multidisciplinary and interdisciplinary approaches further enhance creativity (Costantino et al., 2010). Despite the fact that most traditional and contemporary design disciplines agree that studio teaching is an effective way of engaging students, there are different models and ways of organising design studios (Ledewitz, 1985). Some design studios still focus on a traditional experimentation with materials, while others put emphasis on new realms of the digital. This also poses pedagogical questions for educators, on the validity of traditional studios where

drawing and model making by hand are predominant, as opposed more contemporary approaches where digital tools are in focus.

On a less academic, but more pragmatic level, universities are increasingly becoming part of the global market (see: Fisher, 2009) demanding a constant need for reinvention, change and efficiency in order to be competitive. Studio teaching, especially within the design disciplines, is sometimes considered less efficient in economic terms, and there is a push to rethink it. In contemporary academia, efficiency is often achieved by moving towards online and blended teaching and learning, and by increasing number of students per teaching staff reducing the amount of hands on experimentations and mentoring. Efficiency is also sought by avoiding duplication of similar content in different units, a reduction of quantity of units, and more collaborative and multidisciplinary units with students from different disciplines.

Within the Australian context, the University of Canberra (UC) is a young and small university. While striving to be competitive on the local and international markets, in recent years the architecture and design courses have been constantly changing, following national education trends as well as the needs of industry. The Faculty of Arts and Design is one that has long tradition of collaboration and multidisciplinary approaches to the curriculum, where the interdisciplinary methods to teaching occur at the basic design studios while individual design disciplines follow specialised curricula in later years.

This paper explores the questions posed above by reflecting on the basic design studio taught at the Faculty of Arts and Design at the University of Canberra and questions the value of multidisciplinary and traditional studio approaches in early stages of design learning. The paper starts with an overview of multidisciplinary design studio teaching, followed by a description of the case study, Design Studio 1.1. This case study is then used to discuss two perspectives of studio teaching: 1) specialisation, multidisciplinary and interdisciplinary approach 2) experimentation with materials. We finally discuss pros and cons, as well as perceptions and points of view from students and staff, in order to reflect on the teaching process and provide conclusions and guides for the educators.

2. Specialised, interdisciplinary and multidisciplinary approaches to studio teaching

In western history, the origins of studio-based learning have roots in the master-apprentice learning in the atelier, related to the arts and crafts. Deriving from a European tradition most of the architecture schools in nineteenth century were inspired by the prestigious Ecole des Beaux Arts in Paris (Salama and Wilkinson, 2007), which relied on the brilliant teachers, learning-by-doing and was organised around design problems. A jury consisting of

professors and guest architects judged the projects. In the early 20th century there were dramatic shifts in industry and new radical theories appeared. Following these, a group of modern movement leaders in Germany developed a now famous design school Bauhaus (Naylor, 1985). Walter Gropius, the director and founder of the school, introduced the ideas of 'mass production' and 'new technology' in studio-based teaching with the "conception of design as one great cognate whole" (Gropius, 1935). The school merged arts and crafts creating laboratories and promoting new kinds of collaboration between industry and crafts (Green and Bonollo, 2003). Lackney (1999) also states that US universities adopted "modern" design and architecture education since 1914, and in 1934 moved from the French methods, to the German ones pioneered by Bauhaus. In 1936, under the lead of Gropius, Harvard created a triangular model that integrated architecture, landscape architecture and urban planning (Lackney, 1999). Currently most of the architecture studio is organised around principles that derive from Bauhaus school with reduced multidisciplinary approaches (Attoe and Murgerauer, 1991).

Multidisciplinary studios are not new. However, in recent years the value of multidisciplinary studios and collaboration has been revisited. There is increasing research that supports the interdependence between student collaboration in studio and increasing creativity and innovation (Fixson, 2009). For the purpose of this paper, we define multidisciplinary as involving more than two disciplines in front of a single problem or an issue posed in studio (Lattuca, 2002:712). Usually the approach is juxtaposing various disciplines on a common question; each discipline offers an answer or an approach with no attempt to integrate the ideas. On the other hand, an interdisciplinary approach concerns the links and the transfer of knowledge, methods, concepts and models from one discipline to another. Therefore, an interdisciplinary (or integrative) approach discusses the problem from a new perspective which is achieved within collaboration of various disciplines, while a multidisciplinary approach benefits from learning that there are various approaches to the same problem. Finally we defined a 'specialised' approach to studio as that which concerns mainly one of the disciplines, for example architecture, or industrial design. In this specialized studio, the aim is to deepen into the specialty and technicalities of a profession, such as specific software or construction methods, for example.

3. The case study

Design Studio 1.1 is the first year, first semester foundation unit for students from all 3-dimensional design disciplines at the University of Canberra: Architecture, Industrial Design, Interior Architecture and Landscape Architecture. It is organised as a three credit point unit, which is also open as an elective to other faculties at UC. The studio is structured around

one hour lecture and three hour studios weekly. The unit has approximately 120-150 first year students. This studio consists of series of exercises that are tailored towards an interdisciplinary understanding of design. The design language is approached from various points of view encouraging innovation and creativity. Students are introduced to the skills and techniques for working with diverse materials. Design is taught as processes of thinking, drawing and making. Learning outcomes are: 1) to recognize the interdisciplinary nature of design; 2) explain design processes within a framework of creative and lateral thinking; 3) develop design concepts using a range of mediums and techniques. There are three major exercises that students develop within a semester: AO1: Idea, AO2: Form and AO3: Object. These topics follow stages of the design process, in which a project starts from an idea and finishes with a designed 'object'.

AO1:Idea:

The first three weeks in studio introduce students to abstract representation as an overview to the design process. Students start with an exercise in which they are asked to experience a selected space, and visualise those experiences (Figure 1.). The experiences can range from formal aspects of the space, to less tangible aspects, such as feelings. The aim of the exercise is to broaden student's view of design (as many come with preconceptions form design and technology courses in high-school, or others). The exercise shows to students that they can seek inspiration for design everywhere. At this stage, students can use any media to express their experiences (video, poster, collage, model, sculpture, photographs, recordings, maps, etc.). Usually the visual representations of the experiences range from the
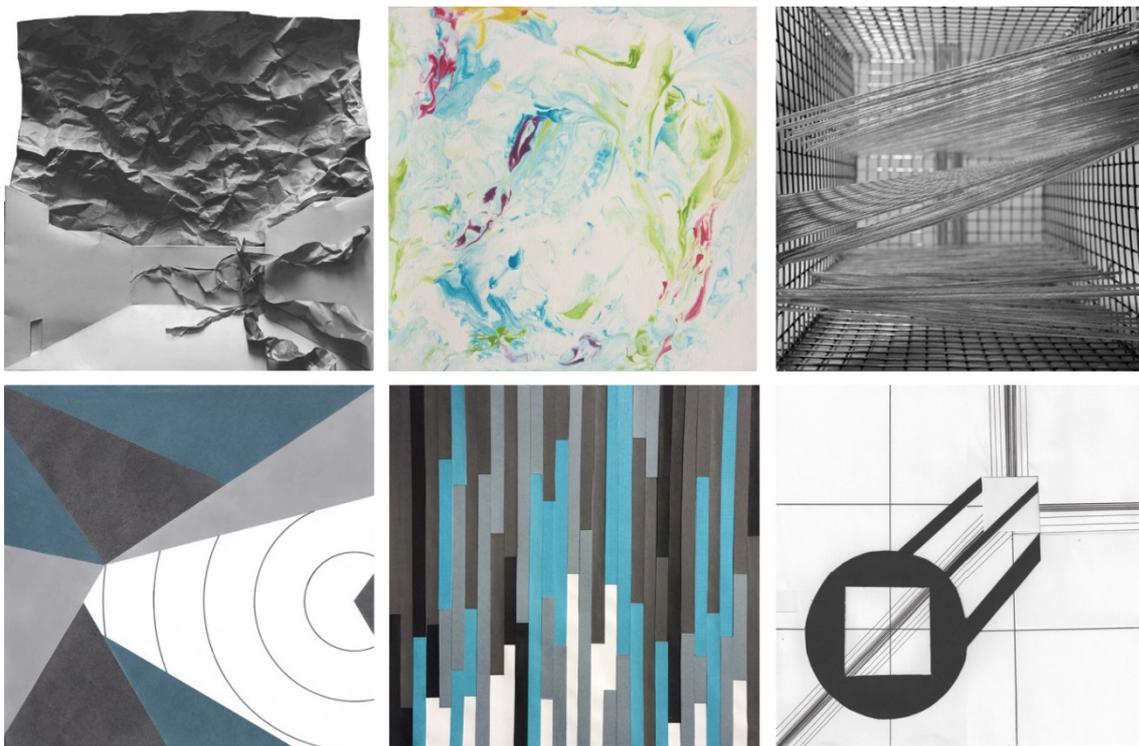

Figure 1. Examples of student work AO1 (top are visual representations of experience and

literal to the abstract. The second exercise of this topic pushes students towards abstraction. In this step students are asked to convey their experiences using only basic geometric shapes and black, white, three shades of grey and one colour by their own choice (Figure 1. bottom). The format is also limited to a square of a shorter side of the A3 format. These limitations in language and format are deliberate, to allow students to concentrate in main aspects of 2 dimensional composition and the relationships of forms in space, rather than being distracted with too many elements, such as forms, colour, etc. These exercises are accompanied with lectures that introduce the basic principles of composition and colour.

Figure 2. Experimenting with various materials in the development of three-dimensional composition

AO2:Form:

After the development of the abstract 2D composition, students work for three weeks to experiment with materials and develop 3D compositions which have a conceptual continuity with previous experience and abstraction exercises. In week four, students are asked to explore folding techniques to generate form. They are encouraged to test various paper thicknesses and transparency degrees (Figure 2), to understand not only properties of the

materials, but also qualities of light and shadows. The lectures support the studio experimentations by presenting the foundations on how to develop three-dimensional compositions using the concepts of dominant, subdominant and subordinate elements, following Reed-Costellow's studio methods (Hannah, 2002). During the studio, students are
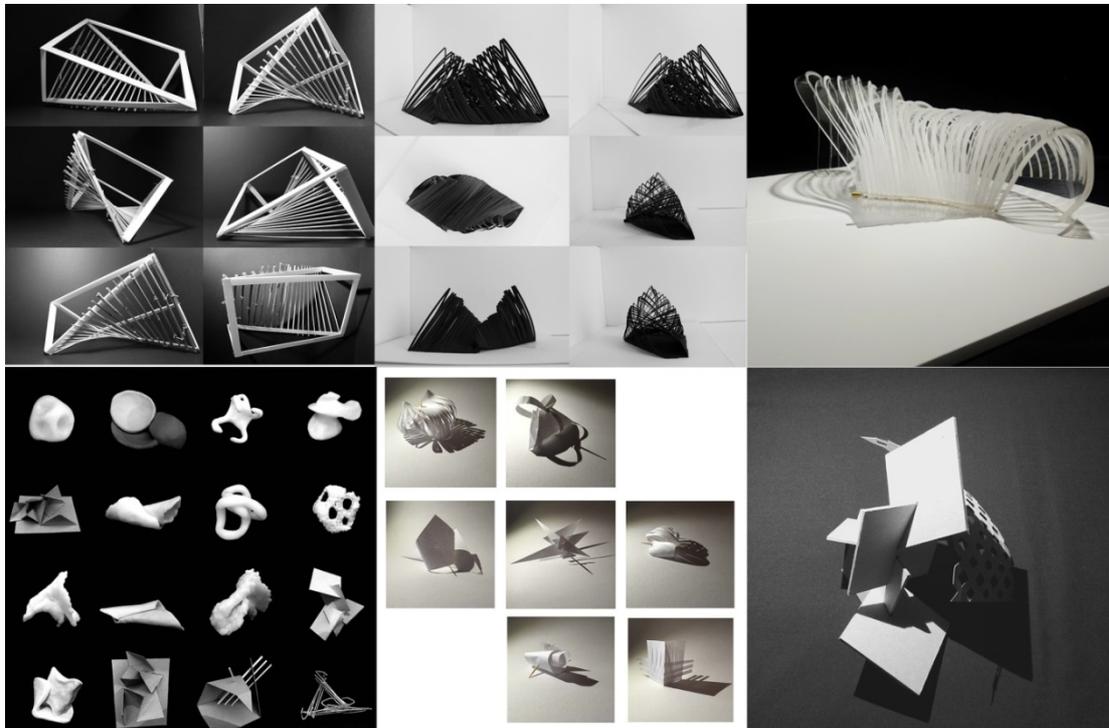

Figure 3. Examples of student work AO2

encouraged to first experiment with the materials, and then take a step back to analyse and evaluate the compositions. In week five students continue to work on the three-dimensional composition and experimenting with various materials. Another important learning outcome at this stage is the further understanding of the creative process of design, in which a form is not necessarily preconceived, but emerges while experimenting with materials. In week six students evaluate their models, and refine a selected model, which will then be used in the final stage of design (Figure 3).

AO3: Object

In this final stage of the project, students are asked to transform their abstract forms into an Urban Stop within a selected site. An 'Urban Stop' can be of any size and function. Constraints are set to a maximum size for three people, and the object must not be larger than 3x5x4 meters. Within six weeks, students need to select a specific place within the allocated site, and must analyse the potential functions and the position of their urban stop. They also design the final object in relation to practical design aspects, such as human dimensions, scale, selection of materials and effective presentation of the design process,

from idea to final outcome. Lectures support the weekly exercises in the studio by introducing notions of scale, anthropometrics, poetics of space and light and experiential aspects of design and space. Students can choose the scale of their intervention based on their chosen discipline (Figure 4). Students are encouraged to share their design approaches and comment on each other's work.

4. Discussion: Student experiences and perceptions of the studio

This first year basic design studio combines multidisciplinary approaches in organisation, and an interdisciplinary method in the curriculum. A multidisciplinary structure of the unit is achieved through collaboration between students and staff from the different design disciplines. Students from the four disciplines are working together in a studio setting. Although, there is a sharing of various approaches to design problems, the multidisciplinary approach is not recognised as such by the students, due to the fact that they are still not

Figure 4. AO3 Urban Stop examples of student work

specialised within their own disciplines.

It could be argued that being first year first semester students, the studio does not produce a clear multidisciplinary value in collaborating across the different disciplines, as their own disciplines are still not formed. Students' level and background does not give enough scope to discuss design from their respective disciplinary approaches. However, some of the

students do appreciate the collaborative nature of the studio setting, as expressed by some of their feedback:

> "…I learn a fair bit from each of my tutorial sessions and I feel that every week I get a little better at the unit. I definitely learn more from seeing the work of my peers and the more collaborative the better."
> (student A: mid semester comments)

We argue that this Design Studio has an interdisciplinary approach at the level of unit content, weekly exercises and assignments, which are purposely kept generic and abstract in order to allow students to recognise universal design principles common for all design disciplines. Exercises and lectures are designed in such a way that they can be applied to any of the involved disciplines. In that sense, the first two topics, Idea and Form, are quite abstract, and the process could be applied to designs at any scale. Due to the freedom of experimentation, in many cases students are confused, especially at the beginning of semester. While it is understandable for the students without any prior design experience, it is sometimes even worse in the cases of students with a previous 'technical' design background, where expectations of 'making within practical constraints' can make the experimental process seem unrelated to their 'preconceptions' of what design is. This is exemplified by some student comments (unedited), below:

> "The first couple of abstract classes made a lot of people confused and slowly lose interest but this current work has definitely brought peoples interest back." (Student B: mid semester comments)

> "I still struggle with components of abstract design and composition however my knowledge and comprehension is definitely miles ahead of where it was before undertaking the unit…" (student A: mid semester comments)

However, the second half of semester brings the assignment to a 'concrete object' and here is where students start to feel more confident in their design, as they start to see a more tangible, and less abstract outcome of the exploration process. This is summarised by (unedited) student comments, below:

> "When I started this unit, I felt lost and uncomfortable. For me, it didn't really display any relevance towards Architecture (my current degree study). Assignments were odd from requirements, object interpretations and page formats. In-class tutorials were also dull and

quiet, and became really unenjoyable. But with the recent assessment (AO2), I found it intriguing to complete and recent in-class tutorials have also become somewhat exciting to participate in.....” (student C: mid semester comments)

It is also interesting to note that a majority of students expressed through the formal unit feedback that they enjoyed mostly the AO2 exercises and the experiments with materials, as compared with the initial 2D and abstraction phase. We would argue that this is due to the perceptions of abstract 2D composition being a bit of 'child play', as opposed to more concrete 3D objects that can, in student's imagination, be a building or furniture or any other object related to their chosen design disciplines.

Finally, anecdotal evidence suggests that students are also often 'misled' by the titles of the projects. For example, when Industrial Design students were asked in their second year what they had done in the basic studio, some of them answered that they had 'only done architecture stuff'. While an 'urban stop' includes aspects of furniture and others very related to traditional industrial design, in the students minds 'urban stop' was not within the realm of 'product design'.

5. Conclusions

While as staff we perceive 'value' on teaching this basic design studio as interdisciplinary unit based on experimentation with composition, abstraction and materials, in general our students have not valued the unit for this approach. Furthermore, anecdotal comments and student feedback suggests that some students feel that this exploration with materials is a bit of a 'waste of time', as many want to jump directly to the technicalities and practical aspects of a product, a building, or computer aided design (CAD) tools. However, from the feedback, students seem to enjoy the multidisciplinary structure of the unit, particularly the collaboration, discussions and peer–feedback of their work in studio.

The interdisciplinary nature of the exercises, predominantly the initial aspects of composition, experimentation and abstraction at the first part of the semester is challenging for many students from different backgrounds, as was discussed above. However by the end of the semester students do appreciate the final assignment, being it a 'concrete object' more attuned to their expectations of what design is.

We propose that interdisciplinary studios have the potential to be further explored in studios at later years of the design degrees, when students have better established their disciplinary boundaries. On the other hand, multidisciplinary studios seem to fit well at the first year

design studio, due to the discussions and collaborative nature. While there are pros and cons in both specialisation and multidisciplinary approach to design, we argue that the diversity of points of views, techniques and approaches at an early stage of design education better prepares design students to be flexible, adaptable, open minded, and, arguably, more creative. This is in line with current evolution of the design disciplines, and new approaches to design solutions solving of increasingly complex problems, with outcomes that are not only physical and material, but moving to the digital and intangible, such as design for services and user-experiences. In essence, the ideal outcome is to achieve a balanced mix of both specialised and multidisciplinary design studios in a course, to achieve both breadth and depth, in line with what has been described as some design literature and professions as a 'T' shaped designer.

The dichotomy around multidisciplinary vs. specialisation is similar to the traditional dichotomy of the generalist vs. the specialist designer. In our case, while there is value and need for quick specialisation (especially in view of the initially described efficiencies and shorter courses), and while quickly mastering digital design software (such as CAD) also an industry requirement, we consider there is still a value in multidisciplinary and interdisciplinary approaches to basic design experimentation and exploration, as these emphasise tools and processes for creativity and collaboration. In this case, the digital is seen as yet another tool in design process.

Finally, we would argue that there is still value in teaching multidisciplinary basic design studios based on experimentation with materials, as described here, whilst there is still room for improvement and experimentation in the teaching methods and tools themselves. While we consider that the content and 'fundamental design principles' remain the same, as for example, the principles from the Bauhaus, it is true that more flexibility and online learning can be achieved (as in the case of Virtual Design Studios), or more use of new technologies such as digital design, CAD and 3D printing could enhance the variety of experimentation in the studio.

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