

LEARNING FROM OTHERS: ENHANCING A POSTGRADUATE PRODUCT DESIGN PROGRAMME THROUGH INTERDISCIPLINARY INDUSTRY COLLABORATION

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ABSTRACT:

If graduating design students are to fulfill the potential of the discipline, it is essential that design education extends beyond the classroom to engage with other disciplines. Design Thinking has emerged as a key mechanism to engage design with business and other disciplines. Consequently, designers are operating in more strategic roles in many organizations that recognise the opportunities that are associated with integrating design as a core organizational activity.

This paper describes how the Product Design programme at AUT University has responded to the need to expose postgraduate students to a range of professionals with expertise in different disciplines through the development of an authentic learning ecosystem. It also describes the opportunity identified to educate businesses and organisations about the principles, processes and methods of Design Thinking, and maximising the learning educational benefits of this situation, through these interdisciplinary collaborations.

Three learning and teaching strategies have been proposed and implemented:

1. External interdisciplinary relationships through external projects;
2. Design Thinking Participatory Workshops for businesses/organisation; and
3. Industry mentoring.

This paper specifically outlines the background and the theoretical perspectives behind these strategies. In particular, the paper explores how the application of these strategies is not only providing unique authentic

learning opportunities for students, but is also assisting in the transformation of a number of New Zealand organisations. We discuss the design and development of each of the strategies, including the approaches used and the role of the postgraduate students. The paper then presents the results of some of these activities and evaluates them from student and industry perspectives.

1. INTRODUCTION

Design professions are increasingly expected to work in interdisciplinary teams, often working toward solving more complex problems. This may contradict aspects of traditional design education where effort (and assessment) was focused on the knowledge and skills of the individual. While expertise (or ability) in a specific discipline is still critical to perform as a designer, a greater awareness and understanding of other disciplines is required.

The Product Design programme at AUT University was developed in 2007 and launched with the first intake of students in 2008 (Withell and Reay 2010). In 2012, the Product Design department has seventy-five students across three years at undergraduate level. The postgraduate programme is small but emerging, with 4 and 5 students in 2010 and 2011 respectively, and 10 (current) in 2012. Developing a new programme presents an opportunity to support new approaches to teaching and learning, without the constraints of institutional history and tradition. A recent focus of the Product Design department has been to expand the definition of a 'product' to encompass a broader range of 'designed' outcomes i.e. 'the product of' a creative design (thinking) process, in response to the global emergence in the broadening of the product designers role. Consequently, a design solution may not be a tangible, physical 3D product outcome. This is emphasised by developing student capabilities in Design Thinking principles, methods and processes (Withell and Reay 2012).

Staff recognise that the three-year undergraduate degree makes it difficult for most students to develop their design education to successfully contribute to the professional design community. Consequently, the

programme encourages those students, driven to work in the design profession, or those who are wanting to make a more significant contribution to the design profession through more advanced academic research, to further their studies via the postgraduate programme (Withell and Reay 2012).

At AUT the first year of post graduate study (called an honours year), while research focused, is considered a 'bedding in' year, where students from the undergraduate programme further develop their core design skills while being introduced to more advanced theoretical design research (Withell and Reay 2012). Following the honours year students may continue into the one year Master of Art and Design programme (thesis year), and often complete or further develop their research enquiry from the previous year.

In the Product Design programme at AUT, to help facilitate a greater awareness (and understanding) of expertise in disciplines outside of art and design, students are exposed to experts through a variety of authentic learning initiatives (Reeves et al. 2002, Callison and Lamb 2004). Authentic learning experiences that reflect real world knowing and doing may better support the translation of formal academic education into practice to help improve meaningful learning (Bennett, Harper and Hedberg 2002). A learning environment such as this involves presenting activities that represent the complex tasks that might be performed by professionals, and where students have access to resources and engage in collaboration, articulation and reflections and they produce outcomes typical of quality performance (Reeves, Heerington and Oliver 2002).

This paper outlines how the application of Design Thinking (Brown 2008, Lockwood 2010, Melles, Howard and Thompson-Whiteside 2012) is being utilised in an authentic learning environment to develop stronger links and engagement with New Zealand organisations. Specifically we describe some of the newly developed external interdisciplinary relationships, outline industry-mentoring activities, and a series of industry/student workshops as additional initiatives to help more broadly educate design students for a design-led future.

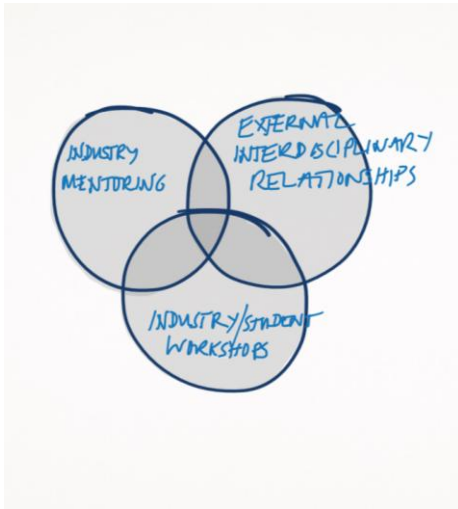


Figure 1: Three modes of external interdisciplinary collaboration and engagement – Authentic learning ecosystem

2. EXTERNAL INTERDISCIPLINARY RELATIONSHIPS/PROJECTS

Generally students are encouraged to take one of two different approaches when they are developing their practice-based design research projects. The first is to start broadly with either a context or topic area (often “wicked problems” based (Buchanan 1992)), and to use design thinking as a means to identify and reframe meaningful (and workable) design opportunities. In contrast, a student may start with a specific and well-defined problem, and use this to help explore and greater understand the broader context in which ‘the project’ is situated.

For most students either approach can be aligned with one of three potential models for interdisciplinary interaction:

1. The student has their own project/concept/prototype and needs interdisciplinary support to fully explore and develop it to its full potential. For example, in order to develop a project to a commercial level, or develop a business or get it to a stage where a business may want a commercial interest, may require a level of external business engagement and support;
2. The student (may potentially be a recent graduate returning for further education) works on an industry-based project. It is important that both the student and the industry partner acknowledge the constraints of a

postgraduate academic programme, student timeline, and ability etc. when developing a suitable project. This approach is potentially suited to smaller, research led projects where blue-sky thinking and concept development is a desired outcome rather than a 'production' ready product outcome; or

3. The student collaborates on a project with an industry mentor on a shared interest project. Most likely such a project would have a clearly defined and identified business/commercial need.

Three examples are presented of recent and current interdisciplinary postgraduate projects.

ENGAGING ENCOUNTERS FOR PRESCHOOLERS IN THE DENTAL INDUSTRY (Tamarin Howse, Honours candidate, 2012)

This current research project is undertaken in partnership with the Auckland District Health Board (ADHB) to rethink (redesign) the mobile dental clinics currently serving pre school children. The project aim is to improve the experience of preschool age children, caregivers and health professionals. It is hoped that by using design thinking to better understand the needs of users will help drive the transformation of the service toward a more engaging and positive mobile dental clinic experience for all user groups. For many children mobile clinics are their first encounter with professional oral health care services, and may also be the first encounter with the medical profession that they are aware of. In terms of shaping a child's attitude and beliefs towards the medical profession throughout their lives it is critical that their early experiences are positive. The objectives of the project are to foster better preventative care from an early age.

NEXT TO SKIN: CPAP INTERFACE FOR SLEEP APNEA (Sam Leong, Honours candidate, 2012)

This research project is undertaken in collaboration with the School of Engineering at AUT University, to develop novel technologies to treat obstructive sleep apnea, a sleep disorder characterized by pauses or abnormally low breathing during sleep. Through practice-based design research, this project explores how a lack of empathy towards patients

experience of equipment based treatment leads to medical solutions with a technological emphasis, that maximises functionality and safety. A human-centred design approach is being used to better understand the emotional and social factors that affect the relationship between people and this specific medical technology to redefine the patient experience of sleep apnea therapy, and improve treatment adherence.

SIMPLY HUMIDIFIED

(Mark Wu, Honours candidate 2011)

This research project was undertaken in partnership with Medicine Mondiale, a New Zealand based organization “focused on developing and commercializing innovative affordable products and technologies that make a significant and measurable impact on improving access to quality healthcare on a global scale” (Medicine Mondiale 2012). Specifically the project was to design and validate a humidification system for a low-cost, highly reliable infant incubator currently under development by the organisation. The challenge was to develop a humidification system suitable for continual long-term use in the challenging environments found in many developing nations. The design of the humidification system was a specific output, however it provided an opportunity for the student to explore the broader context of how design may enhance sustainable social development.



Figure 2: Honours Student Mark Wu (with the Authors) holding his Infant Incubator Humidifier prototype.

MINIMAL RUNNING FOOTWEAR: A CASE STUDY IN ENABLING DESIGN

(Reid Douglas, Master of Art + Design candidate, 2012)

While working closely with a sport shoe manufacturer, this design research project represents a conceptual exploration of minimal running footwear, as a case study to develop a personal sustainable framework termed 'enabling design', which explores how product design can be used foster skills and knowledge in a user, focusing on behavioral change for the cause of sustainability. While the project is both applied in nature and commercially focused through the involvement of an external New Zealand business, the student has used the opportunity of an in-depth personal framework to drive a blue sky approach to shoe design that most likely would not have been possible outside of an academic environment, due to time and financial pressures.

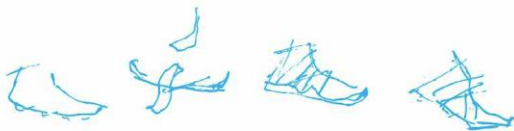


Figure 3: Early sketches- minimal running footwear, Reid Douglas.

2. INDUSTRY/STUDENT WORKSHOPS

Design Thinking is described as the study of the cognitive processes that are subsequently manifested in design action (Cross 1992, Dunne 2006). Owen (2007) describes Design Thinking as the reverse of scientific thinking, where the scientist shifts facts to discover patterns, "The design thinker invents new patterns and concepts to address facts and possibilities by using inductive, deductive and abductive reasoning" (Dunne and Martin 2006, p. 517).

As a result of ongoing discussion with a number of design-led organisations, an opportunity was identified for the AUT Product Design department to develop and deliver Design Thinking workshops to local businesses and organizations. The primary goal of the Design Thinking workshops are to provide business leaders who have committed to integrate design into all aspects their businesses, a further understanding of, and an improved

capability in Design Thinking through a transformational, experiential encounter.

In addition, the opportunity to include postgraduate product design students in the workshops brought significantly enhanced value to the proposition for all parties participating. The postgraduate product design students at AUT University have a well-developed theoretical and practical understanding of the Design Thinking principles and processes. The students were partnered with business leaders in team situations, with the expectation that the students would benefit from the close contact with business leaders and would gain a deeper understanding and confidence of business thinking and contexts with 'real world' participants. Correspondingly, the business leaders were expected to benefit from the close, collaborative practical interaction with a group of young and enthusiastic creative designers.

The initial workshop evaluation indicated that that with some refinement, the model developed offers an excellent opportunity for universities to assist in developing Design Thinking capability, and to assist students in understanding a professional environment, as well as further develop collaborative skills outside of the traditional studio situation (Withell and Reay 2011). Feedback from both students and business professionals indicates that all participants' enjoyed the workshop, and helped them develop a deeper understanding of Design Thinking. With continued development, evaluation and further implementation, it is hoped that the workshops will contribute to raising the international competitiveness of New Zealand businesses through design.



Figure 4: Design Thinking workshop in action.



Figure 5: Design Thinking workshop in action.

A second workshop was run at the end of 2011 and built on the feedback from the first. Instead of a two-day workshop, the activity and content was delivered over a single day of focused activity involving external participants from the Human Potential Centre at AUT University. In contrast to the first workshop, a 'real' brief was the focus of the workshop at the request of the external group who were looking for new ways to approach a problem of enhancing physical activity in office environments. While their approach initially was to develop standing furniture, the approaches used in the workshop resulted in a greater understanding of problems associated with offices and potential design opportunities. Not only did this workshop 'open the eyes' of the health and physical activity researchers to the value of design

thinking as a way to approach complex problems, it led to subsequent ongoing collaboration between the two departments involving two post-graduate summer studentships and staff research where a new office furniture ecosystem was designed and manufactured to encourage and support an active, collaborative office environment in the recently developed Human Potential Centre at AUT University (Fig. 6).



Figure 6: Active collaborative furniture ecosystem.

The feedback from both workshops was similar in that the external participants appeared genuinely 'blown away' by the ability of the students to quickly and effectively take ideas into drawings and 3D models. This was considered a critical aspect of the workshops. The participants from both business professionals and research staff from the Human Potential Centre were experientially drawn and transformed by the power of prototyping as a method and process to drive creativity and innovation. The 'non-designer' participants in the group were quickly inspired to draw and use hot glue guns and to actively and collaboratively engage in the groups' prototyping sessions. In the second workshop, they were more confident, and willing to contribute to and help facilitate sessions.

3. INDUSTRY MENTORING

The product design programme receives considerable support from the product design community in Auckland. As well as fulfilling advisory roles, individual design professions contribute to and participate in postgraduate 'crit' sessions and theory groups, bring a level of real world perspective to the students' academic learning. A specific additional example of external industry engagement is where a local highly recognised and regarded

product design firm annually 'sponsors' a contestable mentoring scholarship to support a final year undergraduate transitioning into the honours programme. While this does consist of a small financial award, the ongoing mentoring and support offered is considered by the department and the student to be the most significant benefit. During the period of study the student is able to visit the firm and utilise the expertise of the firm whenever they require, or just 'pop in and hang out' to gain greater awareness and experience of the professional environment. This programme has been highly successful from the department's perspective, and has resulted in a wider reaching 'summer internship' programme being currently explored to identify greater real world learning opportunities before students transition from undergraduate to postgraduate study.

4. DISCUSSION

The authentic learning activities resulting from the three modes of external interdisciplinary collaboration and engagement described above benefit students in many ways. Anecdotally, students engage more deeply with their projects when they have a level of authenticity resulting from interest and engagement by an external individual or organisation. Feedback from students (and external collaborators) indicates that the greater authentic interaction fosters empathy for and a better understanding of the benefits (and learning associated) with interdisciplinary collaboration and helps in preparing our students for the real world. Building on the initiatives described in this paper the newly established Product Design department at AUT aims to create a collaborative interdisciplinary learning ecosystem for students, staff at AUT, and our wider community. We envision a space where diverse groups and individuals can come together to work together to create shared opportunities using Design Thinking Processes. By facilitating these types of collaborations between staff, students and external organisation we aim to drive high quality research that informs our teaching, and contributes to the design profession, industry and to society.

We also see greater benefits to the department and the University by demonstrating leadership in research in the area of design thinking and broadly communicate the benefits of design led collaboration. We hope that

this will result in the development of greater research connections and consultation with other staff throughout the University, as well as foster greater engagement with external organisation. Our ultimate aim is to grow and develop a quality interdisciplinary postgraduate research capability acting as a platform for positive interaction with University wide and external collaborators.

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