

# DESIGN EMPOWERED ENTREPRENEURSHIP: CASE STUDIES AND DEVELOPMENT OF THE MASTER OF PRODUCT DESIGN ENTERPRISE

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## **ABSTRACT**

This paper explores the 'Design Empowered Enterprise' model and philosophy behind the Master of Product Design Enterprise at Otago Polytechnic, in Dunedin, New Zealand, and looks at the three case studies that have had a significant influence on this developing learning approach.

Commencing in March 2006, this two year graduate research Degree, integrates design with enterprise through taught papers and industry based research in the first year, before the students undertake a major design research project with an industry partner, an external client or through their own approved design inspired entrepreneurial venture. To assist and inform the development of the Masters Degree, three funded pilots have been studied from July 2004 through to mid 2006, each to provide intelligence for learning outcomes based on different approaches and methodologies, experienced while graduates integrate design research with enterprises in differing scenarios. In each year long pilot study, design graduates with Industrial Product Design undergraduate degrees, have been selected, with profiles typical of the graduate designers entering the new Master of Product Design Enterprise.

A model titled the Design Empowered Entrepreneurship Equilibrium Model [fig 1], has been developed for use within the new programme, to illustrate and understand the relationships between user needs, market opportunity and the role of design in the creation of innovative and differentiated products, around which the enterprise is built.

*Keywords: Design Entrepreneur, Design/Business Integration*

## 1 INTRODUCTION

The Master of Product Design Enterprise [MPDE] programme has been developed by the Otago Polytechnic Department of Design, in response to the New Zealand Tertiary Education Commission (TEC), request for educators to develop practical initiatives through which they can deliver more relevant, entrepreneurially-based, industry and business ready qualifications for graduates entering the product design industry sector. The TEC funded development was guided by research overseen by the NZ Government's Growth and Innovation Framework, and commissioned by the Design Industry Taskforce. The Design Taskforce research had focussed on how design is already integrated successfully in a small number of 'design-led' product manufacturing industries in New Zealand, such as Fisher and Paykel Appliances and Formway Furniture and how further prospective 'design-integrated' businesses could be identified and assisted using educational intervention initiatives.

The Otago Polytechnic proposal, which was successful in gaining development funding, outlined a plan to begin immediate collaboration with industry and business, through engaging design graduates in a number of new product design developments with local industries as well as new design driven ventures. The overall aim of the proposal was to develop a sustainable pedagogical approach that would not only prepare graduates for careers in strategic design positions within existing companies, but would provide a vehicle that would prepare, support and encourage entrepreneurial design graduates to create new start-up companies around their own strategic creativity. It is this second objective of 'design entrepreneurship' in particular, that is being explored and supported as a basis of potential longer term growth in the number of design led and empowered enterprises in the future.

## 2 CASE STUDIES

With this objective in mind, it was decided that a number of case studies would be run, where design graduates would be able to experience the design research and development process through different enterprise situations, allowing the MPDE programme developers the opportunity to analysis and synthesise findings across a broad range of different design/enterprise project scenarios. It was decided that the three case studies would each be designed to capture different ways in which the designers may engage with 'design enterprise'. The MPDE programme could then be set up to cater for students either targeting the new programme from a strategic design management perspective, or from a designer entrepreneur viewpoint.

The first pilot case, would study the designer working as a '**consultant**' to a client who had a new strategically identified product to be designed. In the second study, the design graduate joined the design '**team**' within an existing company, working on a new product proposal, and the current and final funded pilot is analysing a '**design inspired entrepreneurial venture**', based on the design graduates own strategic design concept. A further important objective of the cases study series was to accelerate the building of relationships and network within industries and businesses, in preparation for the introduction of the MPDE in March 2006, which requires graduates to participate in design and business research within companies as a requirement of the Masters programme. The three design projects are described to give insight into the scope of activity undertaken, the different design/enterprise relationships and the diversity of 'products' studied, which include a wearable protective/sports/fashion item, technological appliance product, niche furniture products to board sport product.

### 2.1 Case Study 1: Protective Headgear Product for Rugby

*The aim of this first case study was to study the creative process as applied to a strategically focused situation, and gain insight into the process and value of concept development, prototyping and 'proof of concept' when attempting to innovate, create difference and competitive advantage for a business.*

Case study one was with a local Dunedin company, Protective Sports Apparel Ltd, a small business which produces innovative protective products for rugby, under the brand Shocktop, which have been received very well both in New Zealand and in Europe for a number of years. The project funded two industrial product design graduates to work with Protective Sports Apparel Ltd over a twelve month period, on the design and development of a head protection product that would compliment the other protection products of the company. Previously, work had been done by the company, in developing intellectual property for a 'Venturi' cooling system, to

overcome the problem of headgear overheating, but attempts to incorporate the IP into a saleable product were met with mediocre market response, due to the headgear not producing the cooling capacity expected, and with no real visual differential between other existing products accepted on the market. The brief for the funded project was to redesign a new product that would provide the thermal cooling performance required, reduce the manufacturing costs, and produce a headgear that not only performed well in reducing heat buildup, but would differentiate itself in all other aspects including appearance and comfort. Thermal testing was completed on competitor's products to establish performance benchmarks while extensive user (player) research was undertaken to learn and understand the player's needs. As a result of research a 3D compression moulding process was chosen that would not only reduce the amount of joining necessary, assisting to minimise labour, but also present the opportunity to provide a whole new aesthetic for a differentiated new product.

The newly designed product produced cooling performance of more than 25% improvement on the benchmarked product and offered new possibilities to meet the requirements of comfort and protection through the need for only two sizes, where previously there are up to four, as well as eliminating the need for a lace up at the back for adjustment. The case study project was completed at the end of 2005, with the graduate designers able to present the client with two wearable prototypes, to be evaluated by the rugby player users and the New Zealand and UK market. The product has since been tested for conformity to the IRB regulations at the British Standards Institute in England, as well as performance tested by Super 14 professional rugby players, and is currently being prepared for introduction onto the market in October 2006.

## **2.2 Case Study 2: Domestic Gas Heating Appliance**

*The specific aim of this pilot was to involve the design graduate in a fully integrated fashion within an established product enterprise company and identify performance strengths, weaknesses and other output factors of importance for consideration in further intended implementation of design integration in a sustainable way through the MPDE programme.*

In contrast to the first study, the second pilot was designed to look at a more traditional approach of employing a design graduate to work within a design team situation within a local company Escea Ltd. Escea is a gas heating Appliance Company established in Dunedin in 2003 by CEO Nigel Banford that introduced its first gas heating product to the market in March 2005, a product that involved industrial design from the outset, and has been met with a positive market response since being launched. For the pilot project, a special job description was formulated within the project, to involve the graduate in the management team from the outset, in order to learn, understand and contribute to the strategic planning and preparation for the new gas appliance product. At the same time the design graduate worked on the production line in the factory, in order to gain an in-depth understanding of the company, its products, staff and operations. Two months into the project, a brief was developed for the design of a gas appliance for outdoor patio use, and the graduate embarked on an extensive path of research into user needs, markets, environmental issues, technological data and mechanical function. An important facet of this research was the opportunity for the graduate to work directly with the CEO interviewing architects, interior designers, retailers, installers and end-users directly and attend a number of significant national trade shows.

Following analysis and synthesis of the data accumulated, concepts were developed, prototyped and tested over a period of months by the team of designers and engineers. The graduate was then involved in the production planning and operations management of the product, and worked on the initial pre-production assembly and product testing, prior to the gas appliance being released to the market. As a result of the project, the company has now employed the graduate on a full time basis, as well as another industrial product design graduate to work on a further strategically identified product, a gas heating appliance for a niche apartment market, which will follow a similar integrated research and development pathway.

### **2.3 Case Study 3: 'Nook': Hanging chair**

*The aim of the third and final funded case study, was to gain insight into the 'designer entrepreneur' model, allowing participation, observation and analysis of the process of establishing a new startup business based around a design inspired offering intended to address identified user need, within an identified market opportunity.*

This case study was titled the 'Design Graduate Entrepreneur 2006' and was promoted to design graduates from the Design Degree programmes at Otago Polytechnic and the University of Otago, as an opportunity to prepare and present a design/business plan based on the students own strategic creativity, and the chance to get financial backing of \$30,000 plus design/business support to develop 'proof of concept' prototypes and to prepare the 'product' to be market ready within a 12 month period. On November 25 2005, twelve design graduates presented their concepts to the judging panel made up of local design and business expertise. From the design/business plans presented, four were shortlisted to be developed further with the assistance of design and business mentors, to be re-presented in January 2006, for final selection. The winning selection identified 'Nook', an indoor/outdoor hanging chair concept designed specifically for the New Zealand 'holiday bach' market as being a suitable subject of the main study and was granted \$24,000 in financial backing. This concept had proven extremely popular by the public who visited the 2005 graduate exhibition, with a number of orders being taken at that stage, and was considered by the panel as being the project of least 'risk', being closest to being market ready, and would allow a wider coverage of activity longitudinally for the twelve month study. Two other finalist projects will also receive \$3000 each to be used specifically for prototype tooling costs once the initial concepts have been refined and the detail design completed. One plan is for a New Zealand skateboard that will incorporate local material content and be branded to promote sustainability in its construction. However a significant amount of analytical research and development of materials needs to occur before tooling can be developed and finally approved for funding. The other project which will receive funding for tooling is the 'Ocho', a concept for children's furniture/toy, that uses a rotomoulded polyethylene form as its carcass, that can be used outdoors in the plastic format in a sandpit or lawn situation to play on and store toys, or in a foam upholstered form as an indoor furniture/toy product that can be used for sitting or playing on, as well as storing toys while not being used. All three projects will be driven by the graduate entrepreneurs, but will be supported by the developing design/business network associated with the projects, both internally and externally to the Polytechnic. Each project will be followed and analysed to identify critical success and failure factors throughout the projects, as well as to gain insight into strategies and approaches that can be adopted to assist and support future design entrepreneur projects in the MPDE degree programme.

### 3 THE PEDAGOGICAL APPROACH - ACTION

There are only three taught papers in the Master of Product Design Enterprise, in areas of business and operations in semester one, otherwise the overall pedagogical approach is one of 'learning through experience.' It has been well documented that work experience in the 'university of life', the 'school of hard knocks' or 'the real world' accelerates preparation for a career in business[1]. The term 'apprenticeship' has been used by Timmons (1986) to describe this concept and he comments that most successful entrepreneurs have accumulated five to ten years experience of general management and industry experience prior to their first start-up company[2].

In the MPDE, the main vehicle of this approach is the industry placements in the first year of the programme, where the industry becomes a 'conduit for learning' as the students work and conduct research into the elements of the companies overall structure. This includes business and operations, but with focused interest on strategies the company may employ in the implementation of innovation and differentiation in their quest for competitive advantage. To build on this experiential process, the students then complete a major project that addresses a strategically identified need and opportunity, either with industry, a client, or their own independently developed venture. In all cases the emphasis is on the strategic identification and framing of the business opportunity, and the creation of an offering that accurately addresses the user needs, borne out through a process of research, development and prototyping that can be evaluated as 'proof of concept'. The three case studies undertaken have provided a diverse insight into the value of 'action' and the experiential approach to research and learning, and have informed and shaped the learning objectives and outcomes of the new Master of Product Design Enterprise programme.

### 4 'DESIGN EMPOWERED ENTERPRISE'

The philosophy behind this design/enterprise approach to learning is based in the fundamental understanding that, for a business to be successful and continue to grow, it must possess the ability to create and sustain a competitive advantage. The essence of entrepreneurship is creation [3]. Innovation, often the foundation of creations, is critical for any firm (large or small) to compete effectively in the twenty first century landscape. Building on the importance of entrepreneurial action, the essence of entrepreneurship is **newness**: **new** resources, **new** customers, **new** markets, and **new** combinations of resources, customers and markets [4]. It is this philosophy and understanding that has lead to the development of an action model that places 'design' in firm support of and effecting the most critical element within an enterprise - an innovative/differentiated offering, ring-fenced by competitive advantage, containing people, brand, intellectual property and user experience.

The '**design empowered enterprise**' invests in a creative structure and capability, loosely termed 'design', but includes all facets of creativity that collectively contribute to producing new, innovative or differentiated offerings that are pivotal in supporting a business that addresses, balances and maximises user need with market opportunity.

The design empowered entrepreneurship or enterprise equilibrium model [fig 1], separates need from opportunity for purposeful consideration within the MPDE, promoting debate and understanding of the design enterprise 'big picture', while considering essential contributing elements that can be used for critical focus and discussion, while assisting the development of research aims and objectives for specific industry, client or entrepreneurial strategic design situations.

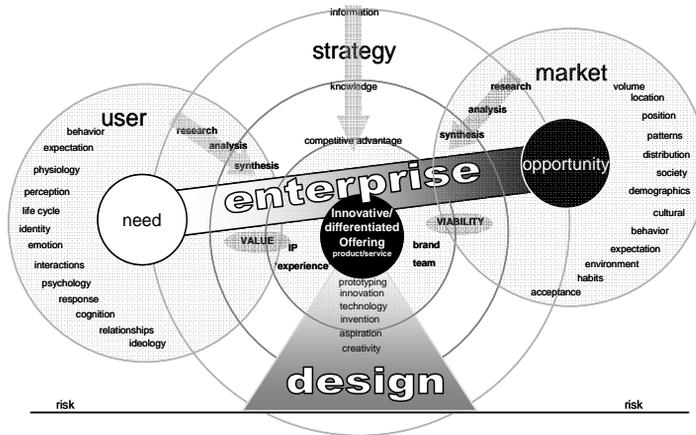


Figure 1. Design Empowered Entrepreneurship Equilibrium Model Pat Maguire 2006

## 5 CONCLUSION

The Master of Product Design Enterprise Degree and the feeder cases studies, aim to increase the understanding and awareness of design integration with enterprise as well as the role design can contribute to creating and sustaining products and services, that when strategically identified, designed and communicated, can provide product enterprise with competitive advantage that can be planned, managed, protected and developed. It is through the action oriented 'experiential' pedagogical approach of the programme, that we plan to meet this aim. This approach provides the mechanism required, to encourage and accelerate the two-way design/enterprise learning process that is essential between the student and industry, to prepare graduate designers to be qualified and ready to engage in strategic design roles within design led or integrated enterprises. Likewise, the two way interaction will encourage enlightened industries to understand and value design and be prepared and willing to invest in creative capability to produce products that not only supply a market opportunity, but fulfill people's needs and desires, provide market advantage and ultimately contribute to increased productivity and profit margins for the company. Design graduate students who approach the programme with entrepreneurial design intention, benefit from the experiential 'real world' nature of the industry based research in the first year, and will translate their learning through their research design/business projects on and into design inspired entrepreneurial ventures, creating future first generation 'Design Empowered Enterprises'.

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