

Enterprise Engine

Samuel Mann

Otago Polytechnic, Dunedin,
New Zealand
samuel.mann@op.ac.nz

Alistair Regan

Research and Enterprise
Otago Polytechnic
Dunedin, NZ
alistair.regan@op.ac.nz

ABSTRACT

This paper describes a model for the development of an “enterprise engine” within a tertiary institution. This approach has the potential to transform IT education. A model is derived to provide a platform for student led innovation and enterprise.

Keywords

Education, Innovation, Entrepreneurship

1. INTRODUCTION

This paper describes a model for the development of an “enterprise engine” within a tertiary institution. This approach has the potential to transform IT education.

Most, if not all, computing graduates will work in an enterprise of some sort. This may be an established business, a start-up, a not-for-profit or even a government agency – all of these are run according to the principles of the enterprise. The premise of this paper is that education can improve the preparation for such a career by a focus on enterprise and entrepreneurship. This paper presents a model of an innovation engine within a tertiary institution – aimed at providing an integrated learning environment for enterprise education. A particular driver is the changing nature of employment where entrepreneurship and enterprise are increasingly important components of graduate employment [2, 6].

Traditionally, the focus has been on capable workplace graduates. This paper applies and extends that to “Educating for Enterprise”. This work is driven by the convergence of several imperatives in vocational education. This includes work-based learning, the evolution of the capstone, the changing nature of innovation and employment, revenue diversification demands Bridge *et al.* [1] distinguish employability (being able to get jobs that exist); enterprise for life (being able to get on, even when right job doesn’t already exist); and entrepreneurship (new venture creation).

In a Northern Ireland context, Bridge and colleagues [1] argue:

Individuals, organisations and countries must become more flexible, responsive, knowledgeable, mobile and proactive, and people who possess enterprising attributes such as boldness, innovation, and confidence will not only profit themselves, but will lead society in its drive to make necessary changes. The future, or at least a significant part of it, is likely to be made by, and belong to, the enterprising.

Bridge *et al.* [1] describe the attributes of an enterprising graduate: “Unique, innovative and creative contribution in the world of work, whether in employment or self-employment” and “Develops the capacity respond positively to change”.

Similarly Eickhoff [4] describes someone who “...actively seeks out and identifies market potential and exploits it”. The European Commission [5] notes:

The mindset and process to create and develop economic activity by blending risk-taking, creativity and/or innovation with sound management, within a new or an existing organisation

We argue that all of these skills and attributes would be useful in the portfolio of Information Technology graduates (indeed all graduates – Bridge [1] gives the example of enterprising nurses). The question becomes: how to achieve that? This is not a simple task, and we can’t hope to produce such attributes by accident. Gilbert [3] describes the challenges to “design and develop applied, industry-engaged learning environments that embrace ambiguity and uncertainty in overcoming pedagogical inertia in educating young entrepreneurs and innovators”.

In this paper a model is derived to provide a platform for student led innovation and enterprise. The current state is considered, first in a general sense, and then with a focus on entrepreneurship. The model is proposed and used to develop priorities for on-going research and institutional development.

2. Enterprise in Education

Previously, Mann *et al.* [8] described an Enterprise in Education model (Figure 1). We used this model to consider the positioning of a School of Information Technology. This assessment was used to derive a set of priorities for development of the School (Figure 2).

Figure 1 arranges institutional activities according to a hierarchy of increasing scope and scale. For the purposes of this model scope and scale are treated as an integrated measure. At the top of the model are major projects such as multi-year externally funded research projects. Next are on-going research programmes, primarily reflecting staff research interests and usually not explicitly funded. Beneath this are major student projects such as capstone projects or year-long internships. Smaller than these are small scale research or development projects, labelled here as “Jobshop”, although funding could be internal or external. Project based learning within courses (other than the capstone) is labelled “micro-projects”. At the bottom of the model are student ideas – although potentially large scale we have put them at the bottom on the basis that most of them don’t get beyond an idea at the lunch table before it is back to the grind of assignment work.

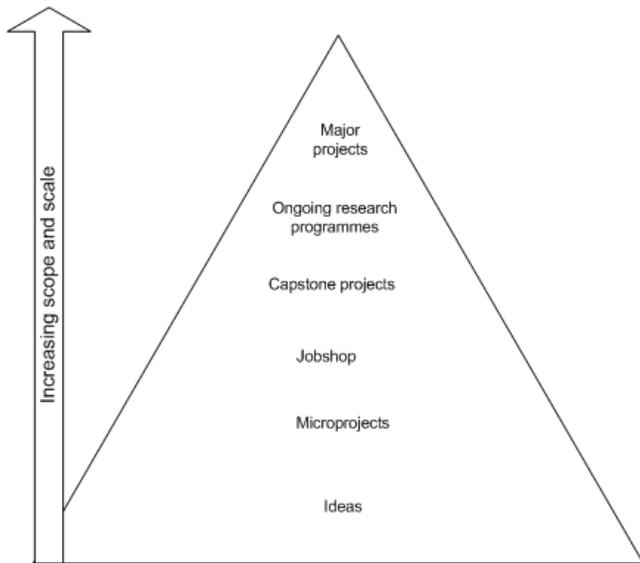


Figure 1: Institutional activities arranged according to hierarchy of scope and scale

Seven priority areas were identified. Of particular interest here are:

- Priority 1: Jobshop
- Priority 2: links between capstone projects and major projects
- Priority 5: Increased use of problem based learning at all levels
- Priority 6: Develop stronger entrepreneurial aspects in projects
- Priority 7: Develop an “ideas factory”. The notion is that an “ideas factory” captures and supports students at all levels to explore their ideas. This implies the creation of a creative space to support initiatives of any scale and from any source.

All of these areas would benefit from a consideration of the role of entrepreneurship in encouraging both an enterprising and entrepreneurial mind-set. This is the focus of the remainder of the paper.

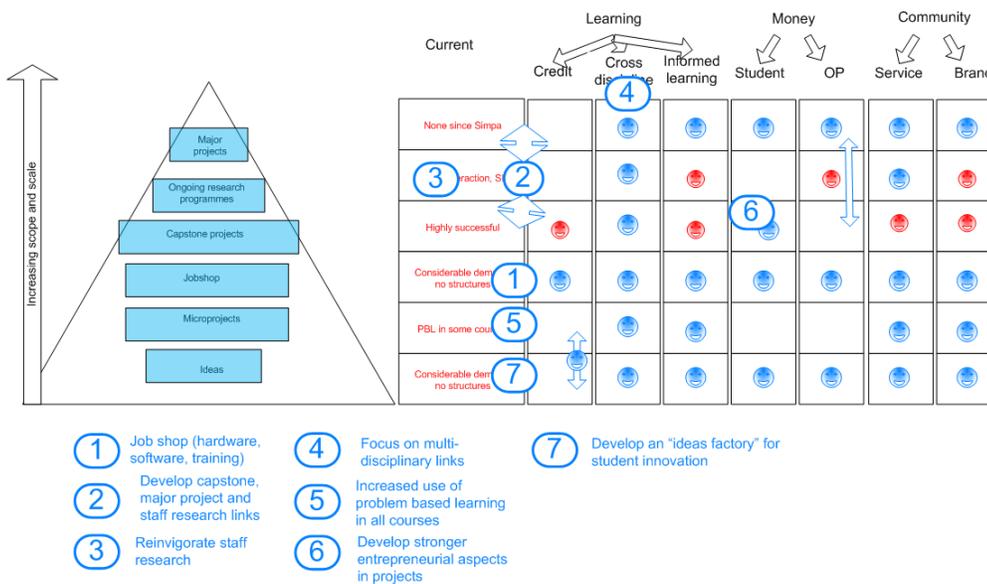


Figure 2: EinE model used to develop a development strategy for the School.

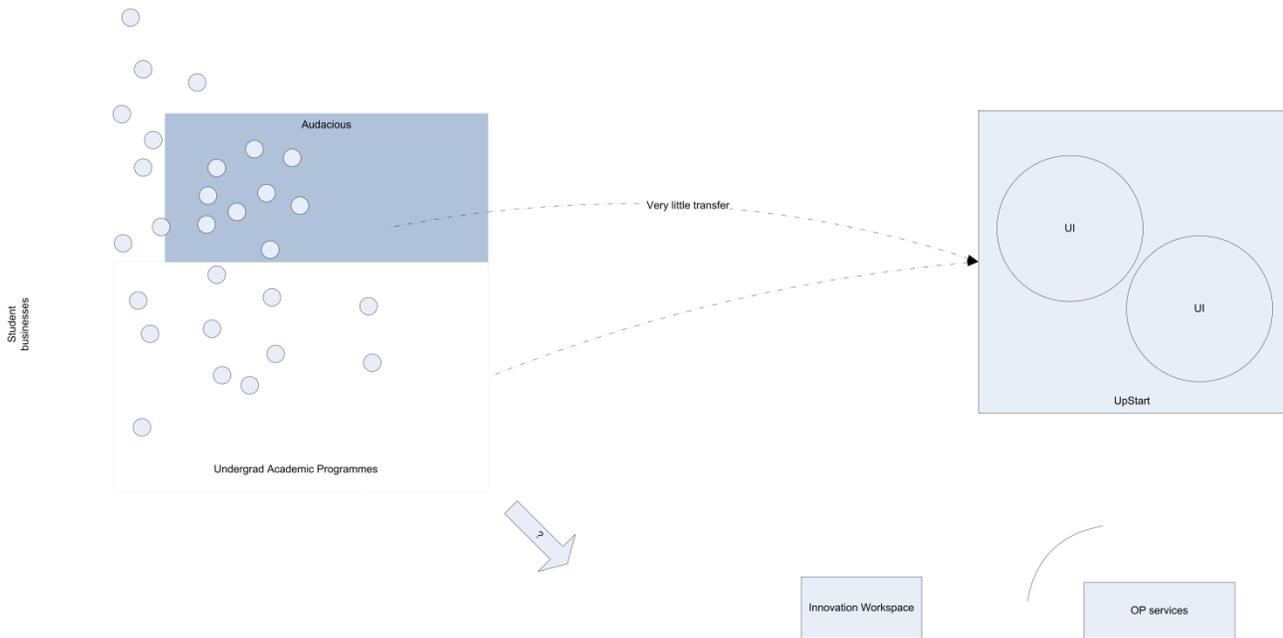


Figure 3: Model of current support for entrepreneurship

3. Entrepreneurship in Education

Figure 3 presents a simplified model of the current state of support for entrepreneurship in education. Although the model could be applied to any institution, to give it context we describe it in terms of Otago Polytechnic's experience.

The model shows that within existing undergraduate programmes there is some development of business. Most usually, this is as part of a capstone project. There is also a student business StartUp competition – Audacious (www.audacious.co.nz). This competition is aimed at the awareness of entrepreneurship, a supportive network and a community of founders [9]. While there is some overlap between the capstone (or other credit-bearing activity) there is not much. Some students undertake business development independent of both formal learning and the support systems such as Audacious.

Within the School of Information Technology there is an entrepreneurial route through the projects, which has been enhanced with this close relationship with Audacious. There have been some successes. One student project (Trunk.ly), for example, placed in the Audacious top five in 2011. This capstone project was subsequently sold to a large USA based software company. Also in the top five in 2011, Fish Basket aims to provide IT solutions to the fishing industry. This development is on-going and the system has been installed on several boats from a major New Zealand fishing company.

Out of the 20 capstone projects underway in 2013, 13 are explicitly entrepreneurial. A further three are working with recent start-ups, and four are working with social enterprises. It should be a priority to support these and future groups to make the transition to successful business. The approach should involve a reinforcement of entrepreneurial aspects of the capstone (such as a requirement for delivering real sales by the end of the project) and to develop a relationship with the city's business incubator UpStart (www.UpStart.co.nz).

Funded in part by government but with contributions from the city council and tertiary organisations, UpStart supports start-up

businesses. Unfortunately, with some exceptions there have been remarkably few start-ups make the transition from student business to UpStart supported business (indeed resolving this discontinuity was the original premise of Audacious).

Lastly on the current model are the various institutional service departments – marketing, research, contracts, finance and the like. While we might hope that these departments would be useful to fledgling companies, in practice there is little engagement.

Figure 4 shows the proposed Polytechnic Innovation Engine. The model can be seen as a funnel from left to right.

The model has the following aspects. The paper describes each of these, and progress towards developing them.

Within all undergraduate programmes, we intend to recognize **enterprise as core graduate outcome (1)**. This was the approach successfully adopted for the development of sustainability as a focus area within the institution [7].

We intend to **extend the overlap between Audacious and undergraduate programmes (2)**. This means more capstone projects (and the equivalent) making use of the Audacious programme. This is also an opportunity to build connections between disciplines within the institution.

The institution intends **investing in Micro-Enterprises (3)**. These Micro-Enterprises are to be:

- Student led and driven
- Small scale funding and services (a smart money approach)
- Added-value focussed
- Preferably aligned with OP values and strategy
- Funded through a validation fund via Enterprise Vouchers.

Polytechnic Innovation Engine

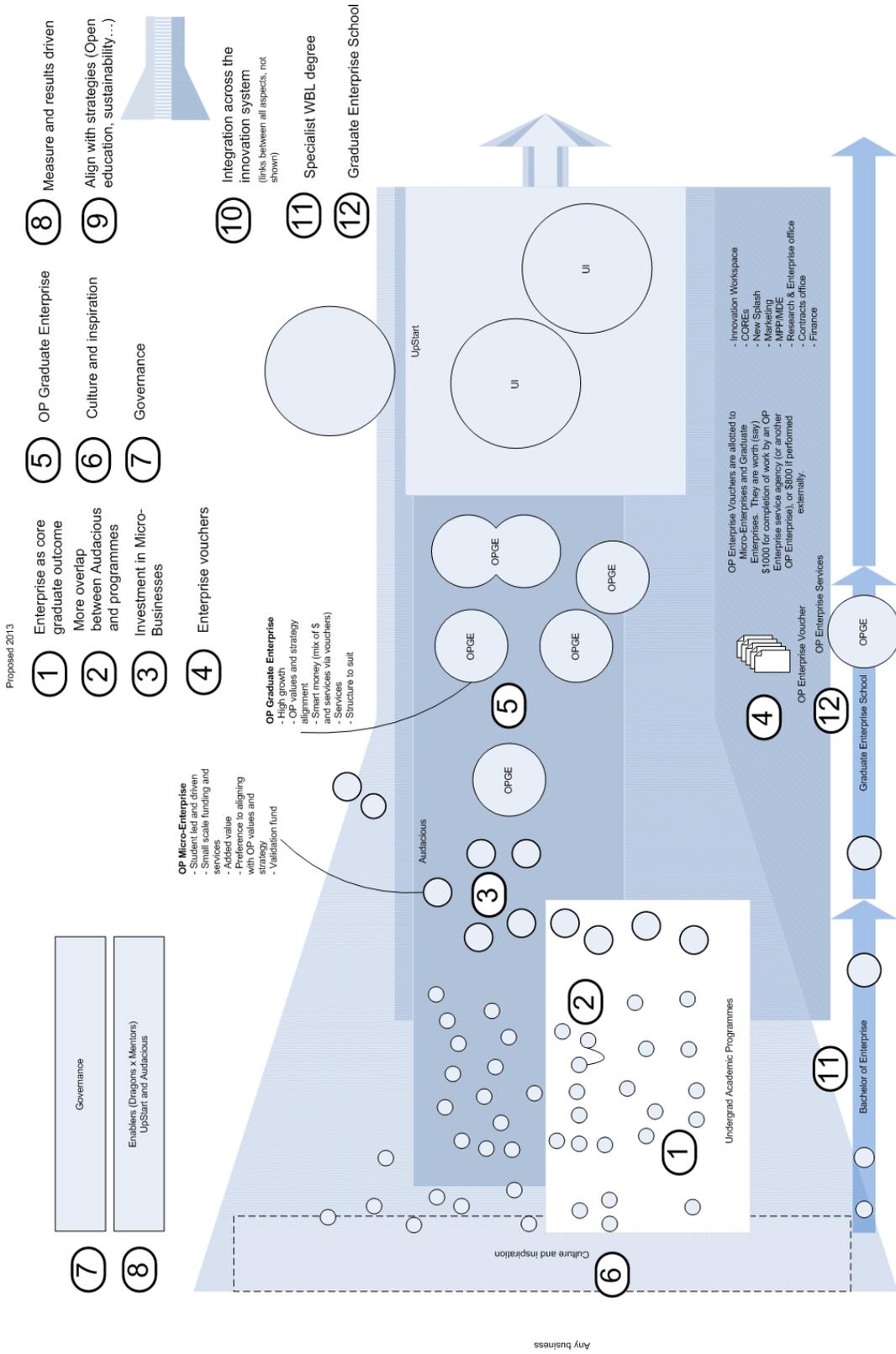


Figure 4: Polytechnic Innovation Engine

The **Enterprise Vouchers (4)** are designed to close the gap between the start-ups and the service departments of the institution. On the expected basis that start-ups require some cash but mostly advice and services, the plan is to incentivise the service departments to undertake this work. The vouchers will be redeemable at face value within the institution, or for a lesser amount externally.

It is hoped that this approach will provide motivation for institutional departments to see themselves in a more entrepreneurial manner.

For a small number of the Micro-Enterprises, we intend supporting the progression to a real start-up as **Graduate Enterprises (5)**. These will similarly be supported through a mixture of money and services. We expect to support these businesses in the area of a year's salary. These businesses will be high growth and must align with Polytechnic values and strategy. The relationship will be structured to suit the nature of the business. This may range from an equity stake to a first customer relationship. The support agency for these businesses is yet to be determined. While it would have traditionally been the role of UpStart, it may be more appropriate to develop a new structure that is focussed on continuing development of the business founder (rather than the investment focus of the existing incubator). It would be expected that graduates in this space enrol in a post-graduate programme – either the work-based-learning approach of the Masters of Professional Practice, or the Masters of Design Enterprise. In either case, this would be aimed at recognising the significant learning in establishing a business and the benefits of reflecting upon that learning and articulating it at an appropriate level.

All this must happen in a context where enterprise and entrepreneurship are valued. In addition to the hoped for effect of the voucher scheme, we aim to **continue to develop a culture of innovation (6)**. Amongst other things such as the potential for an Entrepreneur in Residence, we hope to build closer links with other activities such as the high school level Young Enterprise scheme.

We hope to create a system that will have the benefits of serious clout through a **governance structure (7)** of respected entrepreneurs. It is hoped that they will provide both the oversight of the system but also potentially open doors for the Start-ups through access to their networks. This will also align with the city's Economic Development Strategy of which the Polytechnic is a partner. It is intended that the system be **measure and results driven (8)**.

This scheme is intended to **align with other strategies of the institution (9)** such as Open Education, Sustainability and The Maori Strategic Framework. For example we might choose to preferentially support a start-up business developing mobile applications for experiential learning.

Another version of this model (not shown) looks like an exploded plate of spaghetti, with links between every aspect. That version attempts to portray **integration across the innovation system (10)**. The system is intended to support integration whereby, say, we invest in a business that stems a graduate from one discipline who makes use of the Polytechnic services (including further education), and who works with undergraduates from several disciplines (say Business, IT, Design).

Also fitting into this overall strategy is the possibility of an entirely **work-based learning degree, a Bachelor of Enterprise (11)**. Students would be assisted to establish businesses and learn

on a just-in-time basis as the degree progresses. This same model could work at post-graduate as a **Graduate Enterprise School (12)**.

4. Discussion

Bridge *et al.* [1] distinguish employability (being able to get jobs that exist); enterprise for life (being able to get on, even when right job doesn't already exist); and entrepreneurship (new venture creation). In this development we have deliberately included both Entrepreneurship and Enterprise as the basis for the model. We are not intending that everyone be entrepreneurs, but believe that there is a considerable overlap both in substance and in the experiential benefits of running a business as part of the overall pathway of study.

Also, so that people are not always working at the limit of their competence, we believe that it is appropriate to teach the level of skills at least a level higher than needed in employment. Thus we argue that it is appropriate for all students to experience entrepreneurship.

5. Conclusion

The paper has proposed an Enterprise Engine for developing enterprise and entrepreneurship as a basis for tertiary education. The model was usefully applied to the exploration and articulation of a development strategy for New Zealand ITP with particular emphasis on Information Technology.

ACKNOWLEDGMENTS

This work is the result of extensive discussions with many colleagues. Our thanks go to Phil Ker, Peter Harris, Jonathan Duncan, Lesley Smith, Leoni Schmidt, Steve Silvey, Louis Brown, Fabienne Lecomte, Henk Roodt, Eva Gluyas, Hamish Smith, Joe Davy, Mike Waddell, Bevan Rickerby, D'Arcy Dalziel and Kieran McKewan,

REFERENCES

- 1 Bridge, S., Hegarty, C., & Porter, S. (2010). Rediscovering enterprise: developing appropriate university entrepreneurship education. *Education & Training*, 52(8/9), 722-734. doi: 10.1108/00400911011089015
- 2 Davey, T., Plewa, C., & Struwig, M. (2011). Entrepreneurship Perceptions and Career Intentions of International Students. *Education & Training*, 53(5), 335-352.
- 3 Gilbert, D. H. (2012). From Chalk and Talk to Walking the Walk: Facilitating Dynamic Learning Contexts for Entrepreneurship Students in Fast-Tracking Innovations. *Education & Training*, 54(2), 152-166.
- 4 Eickhoff, M. T. (2008). Entrepreneurial Thinking and Action--An Educational Responsibility for Europe. *European Journal of Vocational Training*, 45(3), 5-31.
- 5 Commission of the European Communities. (2003). Green Paper Entrepreneurship in Europe. EM5765/03 COM(03) 27.

- 6 Hegarty, C., & Jones, C. (2008). Graduate entrepreneurship: more than child's play. *Education & Training*, 50(7), 626-637. doi: 10.1108/00400910810909072
- 7 Mann, S. (2011). *The Green Graduate: Educating Every Student as a Sustainable Practitioner*. Wellington: NZCER Press
- 8 Mann, S., Smith, L., & Regan, A. (2012). *Enterprise in Education: a Model for Institutional Development* Paper presented at CITRENZ, Christchurch. 63-68
- 9 Schmidt, K., McKay, J., Wilson, D., Dick, G., Silvey, S., & Mann, S. (2012). *Audaciously Enterprising Students*. Paper presented at the CITRENZ, Christchurch.