Entrepreneurial Universities in Victoria: An Analysis of University-Based Entrepreneurship Ecosystems

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ABSTRACT

A State of Victoria, Australia, report asserts that concept of the entrepreneurial university in Australia has "never been taken seriously" and had been "found to be lacking in validity" (State of Victoria, 2010, p. 83). This is a curious statement given that dozens of eminent research universities outside of Australia have adopted this strategic approach. This article reviews of the field of 'university entrepreneurship' with emphasis on the concept of 'Triple Helix'. It takes as its case study the nine universities in the State of Victoria. In what sense are Victorian universities entrepreneurial? What are the key facilitators and barriers to becoming a more entrepreneurial university? Which elements of an 'entrepreneurship ecosystems' do these universities possess? The basic approach of the study is hermeneutic in that it relies on the interpretation of sense-making, the process by which people give meaning to experience. We take as our case study twenty-seven respondents in nine universities within the State of Victoria, Australia. The literature review led to the choice of three instruments previously used and validated. My findings show that Victorian universities, if they identify with the concept of entrepreneurial university at all, believe that such a university is one that adopts commercial methods and values and one that engages in commercialisation of research. There is little knowledge of the other schools of thought such as corporate entrepreneurship, Triple Helix, or entrepreneurial ecosystem approaches. The gap between world best-practice and Victorian practice is not being addressed.

Keywords: entrepreneurial university, entrepreneurship ecosystems, barriers, commercialisation, corporate entrepreneurship.

1. INTRODUCTION

By some counts, eighty percent of leading new industries derive their knowledge base from university-based research (Atkinson & Pelfrey, 2010). This contribution to economic and social development lies at the core of the concept of the entrepreneurial university. Universities around the world are increasingly adding a new role to their traditional primary roles as teachers and researchers. This third role is one that that strategically contributes to the development of

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society and the economy. Some view this as the 'Triple Helix', with universities now acting in a third role as regional innovation organisers (Henry Etzkowitz, 2004; Henry Etzkowitz et al., 2000) One suggested way to operationalise the Triple Helix is by examining what Fetters et al. (2010)call the 'University-Based Entrepreneurship Ecosystem' (U-BEE). U-BEE refers to the elements of a particular university's environment—from alignment of strategic objectives to physical spaces—that help or hinder entrepreneurial agents that interface with universities, such as students, faculty, business and industry, and economic development agencies. This entrepreneurial spirit is now seen as a source of innovations in nearly all industries, leading to the birth of new enterprises, the growth and renewal of established organisations, and the very evolution and development of our society itself (Hunter, 2011). It is noteworthy that universities have normally not partaken in this development.

The State of Victoria, Australia, stands out among regions in the OECD for its efforts to make innovation and knowledge-based development a pillar of its strategic plan. With its diverse set of universities, Victoria is one of Australia's prime centres of science and research. At about 5.7 million inhabitants, Victoria is the second most populous state in Australia (Australian Bureau of Statistics, 2011). Victoria's capital city, Melbourne, is dubbed the world's 'most admired knowledge city' and is ranked the fourth top university city after London, Boston and Tokyo (Committee for Melbourne, 2008; Invest Victoria, 2010; Ritter, Rao, & Sathyendhranath). Melbourne is the home of the University of Melbourne, the oldest university in Victoria, and Monash University, the largest university in Australia. Other universities located in Melbourne include La Trobe University, RMIT University, Swinburne University of Technology, Victoria University, Australian Catholic University, and Deakin University. Finally, there is University of Ballarat, located in a regional centre.

While Australia's innovation policies may arguably have driven up a supply of commercialisable innovations, the Commonwealth has not played a role in driving up the supply of entrepreneurs who can take those innovations to the global marketplace. Even though the Innovation Minister believes that 'entrepreneurs, policy-makers, researchers, workers, and consumers are all part of the innovation system', 'entrepreneurs' are mentioned only one time in the Commonwealth's *Powering Ideas: An Innovation Agenda for the 21st Century* (Government of Australia, 2009). Nor has Victorian tertiary education generally found a role in training entrepreneurs to take innovations to the world (OECD, 2010).

This is quite in contrast global best practice: A 2008 European Commission report on *Entrepreneurship in Higher Education* (2008) recommends that 'entrepreneurial thinking should be fostered . . . through all levels of education'. The World Economic Forum's *Educating the Next Wave of Entrepreneurs* states that 'entrepreneurship education can be a societal change agent, a great enabler in

all sectors. . . . Entrepreneurship education is essential for developing the human capital necessary for the society of the future' (Volkmann et al., 2009). OECD's *Higher Education in Regional and City Development: The State of Victoria, Australia* (OECD, 2010) states that

> *Victorian universities should look to match global levels of excellence in supporting entrepreneurship in the curriculum, and build comprehensive support programmes encompassing entrepreneurship training. . .*

Three previous studies provided my intellectual interest in this area of research. The cited 2010 Victorian report stated that 'there is a sense that Victorian higher education institutions prefer to encourage innovation capabilities rather than entrepreneurship.... The concept of the entrepreneurial university has never taken hold in Australia (State of Victoria, 2010). OECD concurred: 'there [is] little evidence of such enterprise support being mainstreamed [in Victoria]'(OECD, 2010). And Cargill (Cargill, 2007) concluded that in Australia entrepreneurship is handled as a marginal, optional, or half-hearted pursuit.

2.   WHAT IS THE ENTREPRENEURIAL UNIVERSITY?

The literature on the entrepreneurial university has grown to be a broad and deep body of knowledge in the last twenty years. Rothermael et al. (2007) identified 173 articles focusing on university entrepreneurship from 1981-2005. A well-known early work is Burton Clark's (Clark, 1998a, 1998b) effort to categorise what is meant by entrepreneurial university as well as to outline the internal and external processes through which it came to being. His main finding was that in order for a university to be entrepreneurial, the organisational culture must facilitate entrepreneurship in a combined top-down/bottom-up fashion.

Since that time, there have developed three broad schools of thought in relation to the entrepreneurial university. The first school of thought, along the lines of Clark, is to view the *entrepreneurial university as an organisational form* (Brennan & McGowan, 2006; Cooke & Leydesdorff, 2006; H. Etzkowitz, 2003; Henry Etzkowitz, 2004; Kirby, 2006; Nelles & Vorley, 2010; Vorley & Nelles, 2010; Woollard, 2010; Yusuf et al., 2010). This is closely related to the 'corporate entrepreneurship' literature as the basis for developing entrepreneurial universities, ideas that have their roots in commercial organisations. The university is regarded as a particular organisational context on an entrepreneurial institution (Kevin Hindle, 2010).

The second body of literature takes a narrower view and defines the *entrepreneurial university as the commercialisation of science and knowledge* (O'Shea, Allen, Morse, O'Gorman, & Roche, 2007; Shattock, 2000; Siegel, Wright, & Lockett, 2007; Swinburne University of Technology, 2000; Treasury,

2004). This refers to the context of spin-outs and patent licensing from 'research intensive' universities. Zhao (2004) defines this as the 'process of developing new ideas and/or research output into commercial products or services and putting them on the market'. Australian discoveries and inventions have been lost offshore because they were not transferred effectively to Australian industry, the Australian Research Council said in 2000 (Australian Research Council, 2000). To reduce this, the Commonwealth in 2001 outlined a strategy accelerate the commercial application of ideas to retain Australian innovations (Commonwealth of Australia, 2001). But rate of commercialization of university innovations is too low (Swamidass & Vulasa, 2009). State of Victoria (2010) refers to the small likelihood that 'universities might generate sufficient income from entrepreneurial and commercial activities to secure their financial and operational future'. However, this notion—that university are full of discoveries and technologies just waiting to be commercialised—continues to be prevalent.

A third school of thought equates the *entrepreneurial university as an entrepreneurial ecosystem,* also known as *the Triple Helix approach*. With the ecosystem metaphor, we can refer to geographical environments that influence an entire group of actors engaged in entrepreneurial activity and potentially the economy as a whole (Cohen, 2006). The way these actors interact is central to this view (Villasana, 2011). Dunn (2005) in MIT's *Technology Review* may have been the first to use the term *entrepreneurship ecosystem.*

As it relates to universities, this has been dubbed the 'University-Based Entrepreneurship Ecosystem' (U-BEE) (Fetters, et al., 2010). U-BEE refers to the elements of a particular university that facilitate or block a person from developing his or her enterprising personality and launch a successful social or business venture. The stakeholders of this ecosystem are any entity that has an interest, actually or potentially, in universities being more entrepreneurship. These may include government, schools, private sector, family businesses, investors, banks, entrepreneurs, social leaders, research centres, military, labour representatives, students, lawyers, cooperatives, councils, multinationals, private foundations, aid agencies, and the like. The entrepreneurial ecosystem is comprised of the physical spaces where entrepreneurs interact; the alignment of institutional objectives; access to university resources like laboratories, researchers and knowledge transfer; market-driven orientation for research; participation of the business community; participation of venture capital firms; active participation of state and federal government in creating the necessary legal framework and assigning economic resources to job and new venture creation.

Fetter et al. (2010) examined six universities that have adopted this approach and constructed a taxonomy of components that can make up a U-BEE. While the components of an entrepreneurial ecosystem are diverse, all successful entrepreneurial universities have an entrepreneurship curriculum. Case studies of

successful implementation of entrepreneurship curricula are copious, e.g. (Blair, 2011) (University of Arizona, 2000) (Charney & Libecap, 2000) (Martínez, Levie, Kelley, Sæmundsson, & Schøtt, 2010). Summarising the literature, and drawing upon Charney and Libecap (2000), Gibb and Hannan (2006) find that 'appropriate entrepreneurship programmes in the university context do impact upon the aspiration to self-employment and business creation'. The Triple Helix Model acknowledges that the "third mission" (beyond teaching and research) of the university is to contribute to economic and social development through transferring technology and innovation (Henry Etzkowitz, et al., 2000).

3. OBJECTIVES AND RESEARCH QUESTIONS

Hancock (2011) believes that a methodology for measuring university-based entrepreneurship is very much needed. Is there an expeditious way to assess this complex phenomenon? How does the concept of the entrepreneurial university fare, in this case, in the Australia's leading university centre, Melbourne, Victoria? In particular, how do expert respondents conceive the concept of entrepreneurial university? Which school of thought do they represent? Is there any 'Triple Helix' thinking? To what extent do Victorian universities contain the components of an 'entrepreneurship ecosystem' as enumerated by Rice at al (2010). What are the barriers to the emergence of more entrepreneurial universities?

4. THE RESEARCHER

Hindle (K. Hindle, 2004) takes the view that an author's perspectives and general philosophy of research should be declared when undertaking qualitative research. The author's is Australia's only professor of entrepreneurship education and one of a handful in the world. Coming out of the IT industry, I have been teaching entrepreneurship for many years and have written a successful textbook on the subject now used through Australia, Southeast Asia, and China. It is inevitable that my own experiences in Australia, in Victoria, and elsewhere would in some way influence the study, and its conduct even if not its outcomes. Gummesson (2000) calls this experience and knowledge 'pre-understanding'. Previous experience has coloured my analysis. Coming from a previous background of well-supported entrepreneurship programs, and being an American who knows that entrepreneurship is one of the fasting growing fields in academia, I have found myself disappointed in my adoptive country and am seeking answers to my own frustration.

5. METHODOLOGY

The basic approach of the study is hermeneutic in that it relies on the interpretation of sense-making (Weick, 1995), the process by which people give meaning to experience. The purpose of his study is to examine the social reality within these universities, particularly the actions and influencers—as well as the interpretations—of that reality. Within management research, 'hermeneutics' refers to qualitative studies in which 'texts' (e.g. interviews and other forms of 'discourse') from a small number of people (expert respondents) are closely read, analysed, and interpreted (see e.g. Cope, 2011; Rantala & Hellström, 2001; Takala & Lämsä, 2004; Webb & Pollard, 2006). We take as our case study the nine universities within the State of Victoria, Australia.

The literature review led to the choice of three instruments previously used and validated:

- *Open-ended questions.* Gjerding et al. (2006, p. 110) devised nine open-ended questions as a measure to study four entrepreneurial universities in Europe to evaluate and quantify their level of entrepreneurship. The authors extracted organisational practices from Burton Clark's case studies (Clark, 1998a, 2004) against which a university's entrepreneurial characteristics could be measured.
- *Inventory of components of an entrepreneurial university.* I used an instrument developed by Rice et al. (2010), who analysed six major entrepreneurial universities. They extracted a set of 'elements of university-based entrepreneurship ecosystems' which serves as a basis for comparison between universities. In essence, the authors enumerate a list of eighteen components that might be found in an entrepreneurial university.

In the sample selection, a two-step approach was chosen. The universities' representatives on the *UniGateway* organisation were selected. UniGateway is a consortium of technology transfer offices and research partnership managers of all nine Victorian universities. The respondents were chosen because their job category has been reported to have significant experience in entrepreneurship education, licensing and start-ups, and economic development, university administration, industry liaison, grant applications, (Association of University Technology Managers, 2011).

The second step in sample selection was to ask each of these respondents to suggest two more respondents, not in the same office, who would have knowledge of university entrepreneurship. These respondents included research deans, entrepreneurship faculty, incubator heads, scientists, and social scientists. In total, twenty-seven interviews across the nine participating universities were conducted. The actual research took place in four steps.

6. ANALYSIS

This study used NVivo 9 and MindManager. The procedure involved first using NVivo's word frequency and tag cloud functions to extract thematic categories from the 88 abstracts obtained through online literature search of 'entrepreneurial universities'.

Additional categories were extracted in the same way from the two instruments described above. This resulted in a list of thematic categories used by twenty-seven respondents in the survey, together with the numbers of references (occurrences) of each theme. The top ones were Entrepreneurs, Innovation, and Development. It is important to note that this list is not necessarily synonymous with 'importance' to the respondents. We can compare it to what I will call 'Question Preoccupation', namely the proportion of time that the respondents spent talking about each question. While 'barriers' appeared only 29 times, it was the respondents' top topic in terms of 'question preoccupation'—with the proportion of the interview taken up as 20%. In other words, while they did not use the word 'barrier' repeatedly, they spoke at length about barriers of all kinds.

A 'thesaurus of descriptors' (synonyms) approach was then employed using NVivo 'queries' to code keyword occurrences within each node. This is a controlled vocabulary selected from thesaurus.com of related words and phrases assigned to organize them by subject (Holsti, 1969, p. 124) (Riffe, Lacy, & Fico, 2005). For example, the node 'barriers' was semantically deconstructed as "barrier OR obstacle* OR block* OR stop* OR hurdle OR impediment OR hindrance OR obstruct*". Themes were assembled, edited, and condensed from the transcripts, then output to MindManager software for further thematic (re-) structuring, and finally re-imported back into my analysis. In the analysis below, the representative quotations illustrating the identified themes are edited for clarity without altering their substance.

7. RESULTS

In the current study, I seek to examine

- Victorian universities in comparison to international best-practice;
- Victorian respondents define an entrepreneurial university;
- Barriers to becoming an entrepreneurial university.

Victorian universities in comparison

Using an instrument developed by Rice et al. (2010), respondents were able to assign marks to Victorian universities compared to best-practice examples in the USA, France, Mexico and Singapore. Respondents scored a set of 'elements of

university-based entrepreneurship ecosystems', which serves as a basis for comparison between universities. If the Victorian respondents differed, all ticked items within the same university's respondents, were included as it was supposed that some respondents were unaware of certain activities, while others were aware. In essence, these are sixteen components that might be found in an entrepreneurial university.

Victoria lags well behind these best-practice institutions on all items, the only exception being that 'ongoing curriculum innovation'. The items where Victorian institutions do compare positively with best-practice are: curriculum innovation; networking events for entrepreneurs; one subject in entrepreneurship; and links to venture funds. However, two-thirds of Victorian universities lack senior leadership support for entrepreneurship; a strategic vision on entrepreneurship; work integrated learning for entrepreneurs; an entrepreneurship activities centre; and an entrepreneurship research centre. Only two Victorian universities have an academic division dedicated to entrepreneurship. They lack a student venture investment fund or an entrepreneurship endowed chair.

The other way to compare Victorian universities to international best practice is to sum all scores (components of an entrepreneurship ecosystem) by institution. By this measure, RMIT ranks well—at the level of the Monterrey Institute of Technology in Mexico. Swinburne falls at the same level as EM Lyon, but the other Victorian universities trail off. After Swinburne follows La Trobe University, Monash University, University of Melbourne, and University of Ballarat. The bottom rankings are occupied by Victoria University, Deakin University, and Australian Catholic University, which have very few components of entrepreneurship ecosystem.

Views defining the entrepreneurial university

Respondents had surprisingly limited comments in how they defined an entrepreneurial university. Their views came down to two general themes.

Technology transfer

These respondents typically defined the entrepreneurial university in terms of new product development. For some, this went beyond technology to include innovations throughout the university: "The entrepreneurial university is any achievement that conspicuously introduces novel or innovative approaches to any of our business operations".

However, a recurring theme was pessimism about the success of the technology transfer and commercialisation process. Only a handful of Victorian universities have achieved a commercial result by spinning off a company. "Looking back ten years we haven't made nearly enough progress". At one institution, "of 22

spin-outs, about half a dozen are currently active. . . .The last one set up was in 2007". "I think the old tech transfer model is dead and buried". "We put a lot of time and money into managing patent portfolios, approaching potential licensees, talking to venture capital. Even when we get initial successes, we really don't go as far as we'd really like to".

Some respondents realise that commercialisation requires something else: "To get those outcomes, there must be embedded education around entrepreneurship". This brings us to the second theme.

Curriculum development

A second theme was curriculum development or 'entrepreneurship education'. "Entrepreneurship in the curriculum?", said one respondent. "In my view, in order of importance, it goes curriculum, administration, community involvement, and only then technology transfer". "The university that explicitly values, promotes and sponsors entrepreneurial initiatives in the broader curriculum- I think that's really important.

Respondents lamented that most students in Victorian universities have no exposure to entrepreneurship and new venture creation subjects. As one respondent said, "I am teaching the only entrepreneurship subject at one of Australia's largest science universities, and it's not even in the Business faculty. When I was asked to teach this unit, we looked around to see whose toes I was stepping on. There were no toes".

What about the demand for entrepreneurship education? "It is not for lack of interest the students. About 40% of our alumni go on to starting a new business".

Barriers to becoming an entrepreneurial university

Respondents were more verbose when asked which they considered to be the key barriers to entrepreneurship.

Lack of entrepreneurial governance

While their definitions may have been limited, respondents spent considerable time commenting on the lack of entrepreneurial governance in Victorian universities. "Entrepreneurial university? My Vice Chancellor says 'she has heard of it'". Respondents uniformly commented on the lack of governance systems within Victorian universities that could be classified as entrepreneurial. "Bottom-up is a pre-requisite, we have our student clubs and competitions, but without top-down support, the university is held back". Respondents agreed that to carry out the missions of education and research, you need entrepreneurial behaviour in the staff and leadership. "I just don't think our governance system is

adequate to modernity". "The vice chancellor-type model is almost uniquely designed to give you a bad result".

There was broad agreement on organisation change. "We need an organisation of a new type. Existing managers bring with them the old values and norms.... We do it this way because this is the way it has always been done". As university administrators typically wish to avoid risk, one finds a lack of top-down support for innovative ideas in teaching and research. University strategic documents do not contain references to a "culture of innovation" or a "ecosystem of enterprise". While the bottom-up interest may well be there, as evidence in student clubs, business plan competitions, and student numbers, that in itself is "insufficient to sustain the emergence of an entrepreneurial university without the top-down 'benediction' of innovation and entrepreneurship as something the university as a whole, not just the business school, should strive for".

<u>Lack of awareness and credibility of entrepreneurship as an academic discipline</u>

Within the university there is a lack of awareness of entrepreneurship as a field of study and its relevance to disciplines outside of business. According to respondents, few people in a position of authority within Australian universities are aware that entrepreneurship is a fast growing area of knowledge throughout the world. Beyond this, some with authority question the very credibility of entrepreneurship as a field of study. As a new field of study, there are fewer A and A* journals in proportion to the total literature. Entrepreneurship academics find their promotion or tenure committees composed of people who are not familiar with their literature, indeed, composed of people who may even be inimical to it. "Not everybody's enthusiastic about entrepreneurship".

<u>Staffing issues</u>

A frequent sentiment is that university scientists and researchers live in walled environments, "within their own silo". This silo mentality exists not just between faculties of different disciplines, e.g. between Science and Business, but also within faculties where disciplinary walls obscure synergies and prevent the "closing of the loop in the innovation process". One Victorian university even has two competing business schools.

Another prevalent theme was the difficulty in rewarding or incentivising entrepreneurial behaviour because of the rigidity of workload and financing models. "Nothing in there rewards blood sweat and tears devoted to doing something differently, in teaching, research and management". "Performance reviews focus on compliance to job descriptions not written with innovation in mind". "There is a feeling that these universities lack sophistication in remuneration, if compared to equity sharing arrangements in other countries". This leads to disincentives: "If you get points for doing teaching and research but

nothing for entrepreneurial commercial activity, then why would you bother?" As well, there is no incentive to transform oneself into a more entrepreneurial actor: "We can't go and tell a researcher to change their field because they'd never get funding. It'd be academic suicide".

Another barrier are "established staff that have been with the organisation a long time get into a particular way of working and thinking". A renewal process would require some staff change-over to bring in people "who contest the way things are done. Ideally you want a loyal and committed staff but what I'm saying is if some people have been there for a long time, it's a problem".

Some respondents commented on the diverging world-views within the university that need to be aligned if an entrepreneurial university is to emerge. Whereas administrators see the university in managerial and bureaucratic terms, academics see it from the perspective of 'knowledge transfer', 'pursuit of truth' and 'societal transformation'. "When administrators and academics come together to design strategies, programmes and initiatives, the clash of world-views may become a fundamental impediment to the pursuit of innovation".

Resource constraints

A dominant theme was the financial constraints of relying on government and school leavers for the bulk of resources to run a university. Since the private sector is so parsimonious in its support, and since there is no tradition of philanthropic or venture capital support, tight-fisted administrators must work within budgets that allow little room for innovation. "Government in many ways, it stymies innovation". "In my humble opinion, the Victorian government has been extremely good at obfuscating those processes".

Barriers outside the university were also identified:

Poor engagement

As mentioned, another concern is the poor infrastructure of venture capital and philanthropy. "In the US, philanthropists and successful entrepreneurs give generously to their alma mater. There simply is not a traditional of philanthropy of this kind in Australia". Compared such countries, the involvement of alumni in the continued success of the university is diminished. Alumni have been some of the most generous benefactors in the rise of entrepreneurship programs.

Cultural barriers

Respondents mentioned cultural barriers as external forces that inhibit the growth of entrepreneurial universities. "We are a lucky country, source of minerals. We do not have to be entrepreneurial". In the same vein, there is a sentiment that the

word 'entrepreneurship' has a slightly negative valence as compared to other countries such as the USA. This may be due to the excesses of the 'cowboy entrepreneurs' of the late 1980's "going beyond what was ethical and acceptable by society", or perhaps also "the perception that the Australian irreverent larrikin personality leads entrepreneurs to question authority and into semi-legal business such as bookmaking or DVD piracy". Entrepreneurs "call themselves anything but" in polite company (Gomes, 2009). "We have that colonial tall poppy syndrome, everybody is equal, or so called equal and it also constrains that celebration of success".

8. DISCUSSION

In designing the study, I thought the question, 'How would you define the entrepreneurial university?' would be the most fecund in helping to see if the respondents understood the three prevalent schools of thought mentioned above. Given the fact that one-third of the respondents were technology transfer officers or research partnership managers, it is not surprising that their definitions focussed substantially on technology and commercialisation. What was surprising was the paucity of information I collected on other definitions. To be sure, curriculum is often mentioned as necessary to go hand in hand with technology commercialisation, and there is the frequent lament that there are no courses to support the role of the technology transfer office, or that the TTO must step in as an *ersatz* for what the business schools should be doing. But none of the respondents spontaneously came up with the current leading definition that includes 'ecosystem' or 'Triple Helix'. Nor were there references to 'renewal', 'recovery' or 'change management', which would indicate an understanding of the corporate entrepreneurship approach or 'turning around' dysfunctional universities. Nor was their much mention of the holistic approach of seeing the university as an 'ecosystem' that can help or hinder the enterprising student or staff to create their new socially or commercially value-added venture.

In the end, this writer must concur with State of Victoria's (2010, p. 83) assertion that the concept of the entrepreneurial university has 'never been taken seriously'. In some ways, Australia has been insulated from developments in Canada, Mexico, the US, Europe, Indonesia, Malaysia, China, even Botswana and Oman, which point to the need to accelerate a holistic approach to the entrepreneurial university for the better of society and the economy.

Nonetheless, within the limited Australian appreciation for the entrepreneurial universities, and within the on-again, off-again support of senior management and strategic declarations, at least a couple of institutes, Royal Melbourne Institute of Technology (RMIT University) and Swinburne University of Technology have succeeded in creating engineering- and science-inspired entrepreneurship programs within their business faculties. The trouble is that

with the waxing and waning of top level support, these programs have experienced serious setbacks in recent years, putting them below world best-practice. For the major science universities such as Monash University and University of Melbourne, it is startling that they have next-to-none entrepreneurship curriculum and no senior management buy-in. Most disappointing are the laggards Australian Catholic University and Deakin University. This latter one is even more so because Alfred Deakin, the university's namesake, was one of the Victorian Era's leading social and political entrepreneurs, as well as a failed business entrepreneur.

These respondents were most articulate in pointing out the many barriers to becoming a more entrepreneurial university. They focused on the well-known cultural issue of Australia's apparent disdain for entrepreneurs due to excesses of the late 1980's and to colonial syndromes such as the tall poppy complex. They were well aware of the problems related to finding and incentivising entrepreneurial staff. They were articulate in their call for better rewards and incentives mechanisms for entrepreneurial behaviour. They were largely unaware of the impact that entrepreneurship education is having in other parts of the world, and could only list a few of the top entrepreneurial universities such as Stanford and MIT.

9. CONCLUSIONS

The gap between world best-practice and Victorian practice is seen in the number of references of the word 'entrepreneurs' in the Commonwealth's 2001 Innovation Agenda (Government of Australia, 2009): ONE.

> *Entrepreneurs, policy-makers, researchers, workers, and consumers are all part of the innovation system. One way to make the system stronger is by strengthening its constituent parts. The other is by strengthening the links between those parts. Australia needs to do both.*

Neither Government nor Public Universities have persuaded me that they are strengthening entrepreneurship.

Based upon my research, I can only adjudge that Australia in general and Victoria in particular, is not serious about entrepreneurship in the university. If education and innovation ministers were serious about strengthening entrepreneurship, they should ask themselves the following questions. Are our universities...?

- Progressively integrating entrepreneurship education across the curriculum outside the business faculty?
- Benefiting from a strong and decision-oriented senior management delivering expedient responses to entrepreneurial requests?

- Building a 'culture of intentional innovation' rather than a rule-based orientation?
- Cultivating an 'ecosystem of enterprise' throughout all schools and departments?
- Seeking non-government funding from outside financiers?
- Minimising barriers and hierarchies to shorten idea creation and decision-making?
- Incorporating entrepreneurship in well-communicated strategic objectives?
- Building extensive alumni networks and bringing in successful alumni entrepreneurs?
- Actively seeking 'Triple Helix' partners?
- Implementing well-structured technology and innovation transfer processes?

AFTER WORD

I would like to conclude with a short comment on the need for entrepreneurial 'perestroika' at Australian universities. *Perestroika* is the Russian word for restructuring. It was a political movement within the Communist Party of the Soviet Union during the 1980s, widely associated with the Soviet leader Mikhail Gorbachev along with his other major policy reform he introduced known as *glasnost*, meaning "openness". Taking the non-economic meaning, *Perestroika* begins from above by destroying bureaucratic hierarchies and from below by allowing new kinds of openness (Bazilevich, 1992). It involves motivating the middle levels of management and incentivising and rewarding staff behaviour. In the current Australian university model, the Vice Chancellor is rewarded only upon fulfilment of the plan, as in a planned economy. Australia needs a flowering of 'glasnost from below' while demanding a 'perestroika from above'.. The university entrepreneurial paradigm is critical for long-term university survival strategies as it is potentially the bedrock that will attract outside funding. Universities in Australia risk being complacent as they have been relying on revenue from the flow of foreign students into Australia, thus ignoring other potentially important areas of funding.

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