



Professor Martin Betts is the Deputy Vice Chancellor (Engagement) at Griffith University. He oversees a diverse and growing engagement agenda at Griffith University spanning student, staff, alumni, donor and industry stakeholders. The University is a major partner of the 2018 Commonwealth Games, and between 2014-2016

has trebled its total fundraising income. In September 2016 the new Be Remarkable positioning campaign for the University was unveiled, signalling a fresh approach to student recruitment and stakeholder engagement. Professor Betts led the creation of interactive Red Zones at the Nathan and Gold Coast campuses which have attracted more than 60,000 visitors. He also chairs the University's Equity Committee and is a Male Champion of Change.



Amanda Briggs has over 20 years experience working in and around Australian Universities and currently holds the position of Industry Partnerships and Projects Officer in the Office of Deputy Vice Chancellor (Engagement) at Griffith University. Previously Amanda has held roles in industry funded research groups

and business development roles in SME enterprises. Amanda has a Graduate Certificate in Communications and qualifications in change management, communications, marketing and creative industries.

At the same time, Universities are faced with declining graduate employment statistics. As highlighted in the preceding CEO Viewpoint by Jan Owen, industry are now expecting graduates to have increased critical thinking, emotional intelligence and team working capability as well as academic qualifications; with a view to reducing the latency between the start of employment and production of real value.

Many Australian Universities are responding by considering graduate employability and entrepreneurial skills as strategic imperatives; addressed in part by the creation of innovation centres, precincts and innovation districts. These spaces enable students, academics, businesses, industry and entrepreneurs to collide, network and collaborate, exchanging ideas, skills and advice by virtue of proximity.

To date an analysis of the various engagement models that Australian universities have employed in embracing innovation and knowledge spaces is yet to be completed. This paper explores the engagement models used by some universities in developing and maintaining their innovation spaces. A number of established university innovation centres, precinct and district partners were interviewed with the view to identify the relative strengths and challenges of the variety of chosen engagement partnerships.

The findings are that there is no one size fits all approach to innovation. However, there are some common elements that were considered irreplaceable in terms of success including: independent governance structures; executive level sponsorship in founding partner organisations, and long term plans with quick wins.

AN ANALYSIS OF EXISTING PARTNERSHIP ENGAGEMENTS FOR AUSTRALIAN UNIVERSITIES AND INNOVATION SPACES

Silicon Valley represents a model of success to most governments as they strive to incentivise the generation of enterprises, jobs and high growth firms in the knowledge economy. As a region, Silicon Valley has successfully fostered numerous highly successful technology companies; based on a clustering of entrepreneurs, venture capital, universities supplying talented employees and valued research, and a grid of social and technical networks (Shavinina, 2015). Indeed, renowned management strategist Michael Porter is quoted in 2008 as saying that "America urgently needs a coherent economic strategy based in large part upon our strengths in innovation, entrepreneurship and higher education" (Porter & Rivkin, 2012).

In Australia, all levels of Government have evolved funding and policy initiatives closer to a framework which rewards increased collaboration between entrepreneurs, business and universities. Their focus is to develop an ecosystem that fosters the skills, talent and jobs of note in the knowledge economy. By 2025, our economy will need another 3.8 million skilled graduates to be able to meet the demands of the new 'knowledge economy' (Universities Australia, 2016). Facilitating the development or attracting the right talent to Australia is paramount to our economic development.

INTRODUCTION

The development of university innovation centres, precincts and districts has enjoyed increased popularity in Australia within the 21st century. As public institutions of education and research, universities have long been the gatekeepers of innovations; their role cemented in the economic landscape as the initiators of new ideas. More recently technological innovations have developed at a speed quicker than many universities have been able to keep pace with. These developments, and the scope and impact of technological innovations as economic drivers, have caused many to question the role of universities in innovation, and how best to translate university innovations to industry, jobs and the economy.

Many universities, in Australia, as has been seen internationally, have established dedicated innovation precincts, collision spaces and physical infrastructure to encourage the meeting of researchers, industry, students and government. Throughout Australia, university based innovation precincts have enjoyed increased popularity since 2000 (Figure 1).

This follows an international trend where innovation districts are recreated with strong "research-oriented anchor institutions, high-growth firms, and tech and creative start-ups co-located in well-designed, amenity-rich residential and commercial environments" (Research Triangle Park, 2017). These districts seek to offer a mix of retail, residential and

No. of new Australian university-based innovation spaces established

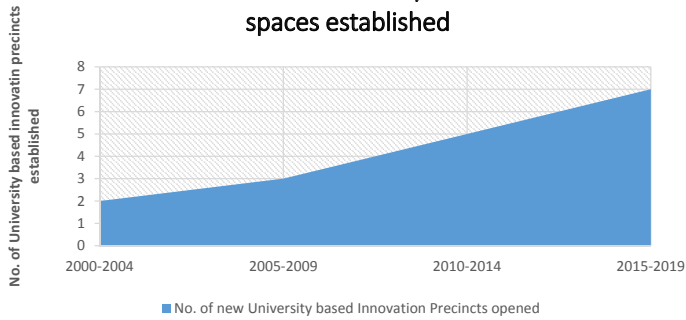


Figure 1: Number of new Australian university-based innovation precincts established
source: ATN Network, 2017 accessed at <https://www.atn.edu.au/about-us/innovation/>

commercial opportunities connected by transit, fibre and social networks. Kutz and Wagner (2014) go further in exploring three types of emerging innovation districts: those emerging near anchor institutions such as universities; those emerging from disused industrial or commercial spaces and those created from transforming traditional science and technology parks (Research Triangle Park, 2017). There are numerous examples of all three forms in America, from Cambridge Innovation Centre and Boston Innovation District to Research Triangle Park in Raleigh-Durham. Research Triangle Park, founded in 1959 successfully transformed a seasonally agricultural economy in North Carolina to a high tech centre and home for IBM, Chemstrand – the developers of AstroTurf – and some 200 other telecommunications, biotechnology, pharmaceutical, environmental sciences and micro-electronics companies (Research Triangle Park, 2017).

On the other side of the Atlantic, at the same time, the University of Cambridge founded "The Cambridge Cluster" to link the "brains of Cambridge University" with industry (University of Cambridge, 2017). These connections were accelerated in 1970 by the development of Cambridge Science Park, resulting in a region today considered Europe's largest technology cluster, employing 58,000 people in more than 4300 knowledge intensive firms (Cambridge University, 2017). Cambridge as an anchor tenant to the district has played a pivotal role in the cluster's success either through its people, ideas, enterprise accelerator, innovation centre and technology park. The result for Cambridge is "more than 1,000 IP licensing, consultancy and equity contracts under management by Cambridge Enterprise" (Cambridge University, 2017).

More recently Innovate UK have launched a series of not-for-profit physical collision spaces between businesses and researchers and academic communities (Catapult, 2017). Catapult Centres specialise in different areas of technology including cell and gene therapy, compound semiconductor applications, energy systems, future cities, high value manufacturing, medicine discovery, offshore renewable energy, precision medicine satellite applications and transport systems; but provide the facilities to work collaborative on late-stage research and development (Catapult, 2017). Catapult centres are established as companies limited by guarantee with their own boards and management team, and funded via a mix of competitively earned commercial funding and core Innovate UK investment. Since 2015, the Catapult Centres have delivered 636 academic collaborations, supported 2850 SME's, delivered 2473 industry collaborations and worked across 24 countries around the world (Catapult, 2017).

The trend for Australian universities to invest and partner in the development of innovation centres, precincts and districts is relatively new compared to America and the UK.

This trend has been fuelled by the 2015 Australian Government's National Innovation and Science Agenda (NISA) (Australian Government, 2015). The Agenda focussed on four pillars:

1. Culture and capital – tax incentives aimed at creating a culture of entrepreneurialism, risk taking and start-ups;
2. Collaboration – changed funding to incentivise research performed in collaboration with industry;
3. Talent and Skills – support for domestic Australian students to embrace digital skills, and changed visas to attract more entrepreneurial and research talent from overseas;
4. Government as an exemplar – making data available to the public and making it easier for start-ups and innovative small businesses to do business with the government.

At a state level, the Advance Queensland program is aimed at reinvigorating science and innovation, incentivising university-industry collaboration that translates results and ideas into commercial realities. It seeks to build on natural advantages via dedicated industry roadmaps, and helping to raise profile as an attractive investment destination (Queensland Government, 2017).

State and federal governments have simultaneously created a policy environment that strongly rewards the translation of collaborative industry based university research activity to commercial enterprise. Coupled with these policy and funding changes is a new focus for the national research evaluation framework – ERA – to measure the societal benefit and impact of research outcomes (Australian Research Council, 2015). For universities this is a massive cultural change from the old mantra of "publish or perish" to "collaborate or crumble" (Kneist, 2015).

Although a number of university-based innovation centres, precincts and districts were conceived and established before the introduction of both NISA and Advance Queensland, the ability to for these centres to gain momentum and quick results has been markedly improved by the changed economic and environmental context of recent years.

Many university innovation centres, precincts and districts share similar objectives including the creation of collision spaces between industry and researchers for commercialisation of IP, incubators for new businesses as an economic driver in the knowledge economy, opportunities for staff and student learning, student internships and graduate employability. In an era that increasingly seeks graduates with industry ready skills, universities are looking to merge their role as knowledge gatekeepers together with being experience providers – supporting students to progress via a series of simulated and real world practical learning experiences.

Many universities have responded by providing entrepreneurship lectures, units and capstone courses to equip students for the emerging work environment. A

smaller number have made the investment to fund dedicated centres, precincts and districts of innovation, where industry, researchers and students are co-located with commercial amenity. Together with the aims identified above, university based innovation spaces are physical and virtual networks designed to increase connection, collaboration and the development of talent and skills, as targeted by NISA. As collision spaces for industry, researchers and academics, university-based innovation spaces enable the commercialisation of ideas from research, a key outcome of the Advance Queensland program.

Most university based innovation spaces within Australia are not developed solely by universities. Most facilities have been established as a partnership between a number of organisations including government, industry and communities, in a collaborative governance and funding structure. This paper explores the engagement models used by universities in developing and maintaining their innovation spaces. Data from number of established university innovation centres, precinct and district partners were analysed to identify the relative strengths and challenges of various types of engagement partnerships.

RESEARCH METHODOLOGY

Participant observation and in-depth interviews were conducted with senior personnel responsible for the engagement partnerships of three large Australian university-based innovation districts. The districts represented a cross section of the marketplace including one of Australia's largest innovation districts, one of Australia's oldest innovation centres, and an innovation network that partnered with four universities and two additional national research and development organisations.

Interviews were also conducted with two innovation district partners including a large multinational telecommunications company and one of Australia's longest and largest technology park organisations regarding the commercial objectives of innovation district investment; and the challenges with working with universities in translating research into commercial realities.

The interviews asked a series of questions about the formation and objectives of the partnership, governance and reporting and relative benefits and challenges of the chosen partnership. Open ended questions sought to identify how mature the partnership was, together with whether the results of the innovation district were deemed to be 'on track' with the project plan and stated objectives.

Observations were drawn from an industry-led national roundtable discussion on university-based innovation districts. Seven universities from Melbourne, New South Wales, Canberra and Queensland were represented at the roundtable together with five government representatives and two industry representatives. The roundtable discussion focussed on the elements of successful innovation districts including planning, measuring success and vision setting. Added to this data, a multi-campus case study of Griffith University is also included in the research.

Content analysis of interview transcripts, notes, plans and

strategies sought to identify the strengths of the chosen engagement partnership, challenges to determine some common elements of success.

PARTNERSHIP MODELS: UNIVERSITY-GOVERNMENT

Partnering with government has the benefit of aligning two key public institutions as economic drivers, working collaboratively to foster and accelerate commercialisation of new innovations. This partnership, although challenging to develop due to respective regulations and processes, is the most popular within Australia. 68% of the identified university innovation precincts partner with governments at either the local, state or federal level.

Governments have primarily played a funding and governance role in these partnerships, providing seed funding for the establishment of dedicated facilities and programs with the view that the centres will be self-sustaining after the initial start-up phase. Kutz and Wagner (2014) have identified a variety of other roles that governments could play, and some international examples, to assist with the impact that innovation districts can make as economic drivers (Kutz and Wagner, 2014). These roles include the provision of tax incentives for commercial investment, relaxation of zoning and land development assistance, provision of transit and telecommunications infrastructure to support the district and direction of education budgets to assist with human capital development (Cambridge University, 2017). In Australia the provision of this type of governmental assistance has been limited.

The Federal Government has a number of tax incentives in NISA aimed at stimulating investment in the innovation ecosystem and the Gold Coast City Council has provided investment incentives to stimulate commercial opportunities at the Gold Coast Health and Knowledge Precinct – a precinct to be developed in 2019 on the 2018 Commonwealth Games site in conjunction with the Queensland State Government and Griffith University.

Despite the popularity of this approach, based on the recent appetite of governments to invest, this type of partnership provides some unique challenges. Typically, government funding is provided on a limited term basis, and is subject to the impact of elections and in certain circumstances, the time investment in applying for government funding is burdensome, fragmented and obstructive (Davies, 2015). Cambridge Innovation Precinct (Cambridge University, 2017) and Research Triangle Park in Raleigh-Durham (Research Triangle Park, 2017) have changed the economy of districts significantly but over a 60-year timeframe. Yearly or bi-yearly funding, or funding on election cycles, is often not sufficient for the impact desired by government partners. These challenges severely impact the sustainability of innovation precincts, that often seek longer term partnerships to develop momentum, reputation and attract large scale investment for commercial and equity investors.

Governments are also known to be risk adverse. Their responsibility to be good stewards of public monies, and to show return on their investment, is critical during election cycles. This is different however to sharing financial incentives

to the broadest group of people when it comes to stimulating entrepreneurial ventures that will drive economic growth and jobs. There is evidence that merely incentivising more entrepreneurs (and students) to start new companies is not the most effective means to stimulate economic growth (Scott, 2009). Rather, policy makers should "support commercially viable R&D projects at small companies" (Catapult, 2017). Government and university partnership in funding innovation and collision spaces to facilitate the meeting of researchers with seasoned entrepreneurs is therefore a quintessential first step to this targeted support.

UNIVERSITY-CORPORATE

A number of other universities are developing innovation spaces in partnership with corporate partners either with or without the involvement of government. Corporate partners tend to be large national or multinational players in telecommunications, finance and health industries including Optus, National Australia Bank, AMP, Johnson & Johnson, Siemens, Santos, PwC to name a few. Many large companies are in periods of transformation, facing disruption based on technology, personalisation and the speed of change (Johnson, 2016). These corporations are hungry to seed, adopt and embed new innovations to maintain their relevance and create a culture of intrapreneurship via colocation and exposure to entrepreneurs and a robust innovation ecosystem (Altringer, 2013). Partnering with universities, students, start-ups and entrepreneurs in an innovation space is a physical way for large corporates to access new talent and ideas.

Co-branding of corporate education and short course programs and sponsorship of university engagement activities are key benefits for corporate partners seeking to leverage the relationship with credible universities. These programs enable internal capability and skills training together with market positioning as thought-leaders in specific industry areas, for example the Optus Macquarie University Cyber Security Hub (Dodd, 2016). This co-investment of \$10 million will provide executive education and short course training, degree courses, research, consultancy services to corporate and government clients. Optus plan to use the centre to build internal skills whilst Macquarie University benefit from an industry partner to ensure relevancy and applicability of their programs. The partnership provides both organisations with the capacity to influence policy and with public branding and positioning.

Corporate partners however are also clear about their need to gain a return on their investment. Securing additional procurement opportunities from university and other innovation district partners is often key to their decision to invest. Facilitating procurement arrangements is often challenging for innovation districts looking to attract high calibre corporate partners. It often means taking a long term view and challenging current practices.

Corporate partners are also a rich source of student placements and graduate employment, they have valuable insights and input into course curriculum design and bring relevance to university course content via guest lectures and the setting of practical problems with access to data. Corporate partners also have large networks and often international connections to assist with scaling ventures.

The Australian economy however has relatively few large-scale research-intensive industries for universities to partner with. Small to medium enterprises make up over 55% of industry value added to the GDP in 2013-14 (ABS, 2014) and provide 70% of private sector employment (Holden, 2016). This is significantly smaller than the American economy. The capacity of corporate investment in Australia is therefore limited in scale.

Cultural challenges between universities and corporates have also made collaborations challenging due to diverging motives, cultures and lack of trust (Jonsson et al, 2015). Commercial revenue imperatives are more familiar to Australian universities in recent times. However, the value of societal benefit still features heavily in most academic's modus operandi. Resolving these differences is often the challenge to successfully realise potential from linkage and commercial research projects.

OBSERVATIONS

"There's no one size fits all approach to innovation districts" (Interviewee 4, 2017). However, there were some common elements that were considered important in terms of successfully achieving the set objectives for university-based innovation spaces included:

- 1. Independent governance structures**
Governance was found to be a key element in the success of all university innovation spaces interviewed, the important element being agility – being able to move quickly, adapt and iterate as required "especially in the first year of operation" (Interviewee 5, 2017). Independent and balanced boards, able to act with agility, were central to the spaces ability to respond to its complex constituents (Kutz and Wagner, 2014). Many boards provide one spot for each founding partner however a board structure balanced against the objectives for the space is perhaps more appropriate. Finding members with the ability to span industry and university cultures, structures and objectives is also critical.
- 2. Executive level sponsorship in founding partner organisations**
Alignment of values and objectives is paramount for successful partnerships. Although most partnerships are founded on personal relationships with key stakeholders within the organisation (Kutz and Wagner, 2014; Interviewee 5, 2017), development of networked connections between partner organisations is critical to the continued success of the project.
- 3. Long term plan with quick wins**
Attraction of long term investment is also important. Those innovation spaces backed by revenue streams – either retail or commercial rent, property or endowment assets, or equity positions in high growth firms – have financial buffers to increase their risk profiles. Education is the core business of a university – and expenditure is measured against its return in fulfilling this core mandate (Interviewee 1, 2017). How the university's involvement in an innovation space further advances its ability to educate is a critical question to answer (Interviewee 1, 2017).

CASE STUDY:

Griffith University

In under 50 years Griffith University has grown to be within the top 50 universities under 50 years old; ranked in the top 3% of Universities worldwide and ranked 5 stars for graduate employability (Griffith University, 2017a).

With over 50,000 students on 5 campuses within South East Queensland and online, Griffith is a peri-urban university that enjoys co-location to many major shopping, sport, commercial and health precincts. It also enjoys strong industry and community linkages, led by an ambitious engagement plan (Griffith University, 2015) to help improve the performance, enhance the reputation of research and teaching and learning activities.

Moreover, the engagement plan lays the foundation for internal cultural change, refocuses engagement activities by embracing the application of knowledge and knowledge transfer with external partners, typically framed by the search for collaborative responses to grand challenges.

Griffith University's innovation journey is reflective of international trends and embodies the diverse value and values of its many campuses and the communities in which they are set. With many innovation programs, student challenges and workshops happening throughout the academic groups, advancement of innovation spaces will see Griffith explore all three types of innovation districts: disused commercial, industrial and retail spaces, traditional science and technology parks, and dedicated spaces anchored by the university.

Gold Coast Health and Knowledge Precinct (GCHKP)

The GCHKP is a partnership between Queensland State Government through Economic Development Queensland, Gold Coast City Council, Gold Coast University Hospital, the Gold Coast Private Hospital and Griffith University (Gold Coast City Council, 2017). It is planned for completion in 2019 on 200 hectares that is already home to Gold Coast University Hospital, world-class health research at Griffith University and the Gold Coast Private Hospital. The site will repurpose the \$550 million Commonwealth Games Village and result in a new permanent mixed-use residential community with more than 1200 dwellings.

The aims of the GCHKP include strengthening and diversifying the Gold Coast economy; creating jobs by attracting businesses from a range of industry sectors; supporting the growth of new health, IT and knowledge-based businesses; attracting investment; stimulating knowledge, information and technology sharing between Griffith University researchers and commercial enterprise and attracting talent such as internationally recognised researchers, clinicians and collaborators (Gold Coast City Council, 2017).

The precinct will be home to the Advanced Design and Manufacturing Institute, Asia Pacific Medical Training Hub and the Griffith Institute for Glycomics, a world-leader in the development of next generation drugs and vaccines to fight diseases of global impact.

The precinct enjoys a number of government benefits including tax incentives, building charge discounts, priority status for accelerated development and targeted investment and trade

opportunities via Austrade. Government partners (local, state and federal) are providing a number of financial and non-financial benefits to the precinct development and success.

The partnership between Griffith University and the Gold Coast University Hospital has been developed over a long period of time and includes many student placements, colocation of staff, sharing of knowledge and joint research. The partnership in the GCHKP will build from this trusted partnership to include the private hospital.

As an anchor research institute, Griffith University will accelerate its reputation as world-leading medical research and development hub. Griffith is known for developing the first needle free vaccine for Strep A, uncovering the history of Aboriginal Australians in a world first genomic study and for the 2017 Australian of the Year, Professor Alan Mackay-Sim, whose research on how nerve cells in the nose regenerate pioneered the way to safely apply the same regenerative process to damaged spinal cords (Griffith University, 2017b). Other researchers are winning plaudits for their work seeking new therapies in the fight against cancer and infectious and neurological diseases.

Griffith's medical research strength has taken considerable investment and time to develop. It is with this background that Griffith becomes an anchor education institution to the GCHKP to further develop its research, its ability to share knowledge with GCHKP partners and commercialise its IP and innovations to increase the impact this knowledge can make for society.

GLO@Logan

Griffith's campus at Logan is located half way between Brisbane and the Gold Coast on the M1 corridor. The campus is smaller in size, course offerings and services a diverse student cohort, many first in family to attend university, from low socio-economic environments or from international backgrounds. The partnership between Griffith Logan Campus and the Logan City Council is strong and well aligned. The Logan City Council has been pivotal in a number of cultural change projects including the Logan Together Project – a partnership between local, state and federal governments, the Logan Hospital and Griffith Logan Campus aimed at using data driven strategies to intervene between 0-8 to change the trajectory of lives and the community in a first collective impact intervention of its kind in Australia (Logan Together, 2015).

The GLO@Logan campus will open in 2017, after a successful year of entrepreneurial events and programs aimed at garnering community and industry support for start-ups and small business acceleration in the region. The facility will be housed in a recommissioned industrial space for students, community and enterprise to co-locate and undertake program and education on enterprise, entrepreneurship and innovation.

Co-investment in a broader program of innovation hubs and activities is also being sought where Griffith Logan Campus will facilitate a number of outreach programs within the Logan and Redland City Council areas. These programs will assist the university with industry connections, reputation and student attraction – all key drivers for the university. RDA and State Government and commercial support will assist to enable programs to scale, increasing their impact in changing the economic mix of the regions.

Griffith University / Brisbane Technology Park partnership

Brisbane Technology Park is the largest and most prestigious business park in Queensland, and home to over 170 local and national companies, employs 5,500 people with a further 45,000sqm in prime office space to be delivered in next ten years (BTP Info, 2017). It is located under 6 kilometres from Griffith University's Nathan Campus which accommodates over 14,000 students.

This emerging partnership will strengthen the education expertise of Griffith University to delivery accelerator and entrepreneurship programs for Brisbane Technology Park tenants together with further graduate programs and short courses in leadership and business management. The park will facilitate student internships and graduate employment opportunities and plans for colocation of students and staff in collision spaces, retail and urban mixed spaces and though networking and joint events. The partnership seeks to harness the assets and strength of each partner by working collaboratively to increase the commercial nexus, human talent and connection between entrepreneur and researcher that exists within the district, but had previously been unexposed.

As can be seen, Griffith University is exploring all three types of innovation districts as articulated by the Brookings Institute (Kutz and Wagner, 2014), driven predominately by the nature and demographic mix of both students and researchers at each of its campuses. It is seeking to deepen industry connections as a result of developing and sustaining its involvement in innovation districts for the primary goals of student experience (internships and graduate employment), knowledge sharing and commercialisation of research.

CONCLUSION

Breaking down the barriers between universities and industry is critical for student attraction, retention, graduate employability and building a culture of relevance for university staff and programs. Engagement models that facilitate long term, co-invested partnerships are central to a sustainable innovation precinct enabling university researchers to collaborate with industry. This collaboration is a valuable input measure to the innovation processes that drive economic development in the knowledge economy.

As governments seek to stimulate economic development and jobs in the knowledge economy, targeting incentives on the translation and commercialisation of research by seasoned entrepreneurs is a wiser investment than wholesale incentivising start-ups (Catapult, 2017). Government levers of tax incentives, land and zoning leniencies and provision of transit and telecommunications infrastructure to support precincts are often underutilised in the development of economic regions in Australia.

Corporate investment is a valued partnership to the innovation space adding a rich source of experience and relevance. There are many benefits both for corporates and for universities in a deep multi-faceted partnership that involves the exchange of student talent, industry placements, short courses, internal capability development and consulting are exchanged for guest lecturing, industry advise on curriculum and industry workshops, collaborative research projects and co-branding of programs into the corporate and government marketplace.

Developing the depth and scale of investment into university based research and development and venture capital within Australia that is enjoyed in America would assist to facilitate the translation of research and innovation into commercial reality.

Based on the success of Silicon Valley clustering entrepreneurs, venture capital, universities supplying talented employees and valued research and a grid of social and technical networks (Shavinina, 2015), universities around the world are leading the expansion of their knowledge into innovation districts. The changing commercial and policy environments that surround universities are making it easier and timely for collaboration to occur – either in the innovation space – or more likely over a drink at a local retail option. The mix of retail, commercial and education spaces supported by transit, fibre and social networking can be either created; or overlaid over the existing infrastructure.

If it is timely for America to urgently develop a "coherent economic strategy based in large part upon our strengths in innovation, entrepreneurship and higher education" (Porter and Rivkin, 2012), then the development and maturity of Australian university-based innovation centres, precincts and districts is also timely to address the impending skills gap of graduates able to meet the demands of the new 'knowledge economy'.

FURTHER RESEARCH

This paper sought to explore the engagement models used by universities in developing and maintaining their innovation spaces with a view to identifying popular models of engagement, their strengths and challenges and to draw some common elements of success, if possible. The paper used a Australian context, a market that is relatively immature in university-industry collaboration in innovation spaces, when compared to the United States of America and the United Kingdom.

Further enquiry into university-based innovation districts from the perspective of industry, governments and participants – students, tenants and entrepreneurs - would add value to the research. Additionally, comparing the strengths and effectiveness of university-based innovation spaces to commercially operated innovation spaces would also prove insightful.

Evaluating the impact of university-based innovation districts to the local, regional and national economy; to development of industry ready tertiary qualified graduates and to university-industry collaboration in the form of consulting, linkage and other research grants would also add value to the literature.

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