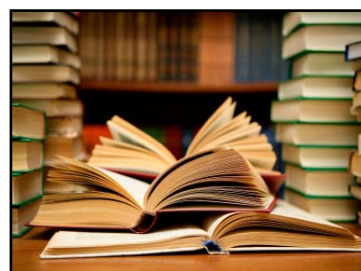




## report

**Optimising the Economic Benefit to Communities  
of Higher Education**

**December 2008**





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## 1 Introduction

Numerous global market drivers have led to the simultaneous internationalisation and commercialisation of higher education, particularly in Australia. Since the Dawkins reforms in the late 1980's Australia has experienced an erosion of its research and innovation capacity at a time when the shift to a knowledge based economy has generated unprecedented demand for research graduates. To overcome this decline, Australia needs to move away from the view that the role of universities is predominantly to provide a population-driven education function, and to focus on establishing world class research universities that fit within regional and national innovation systems.



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## 2 Market Drivers

University competitiveness can be assessed by the institution's ability to continually upgrade its operational environment to best achieve the strategic goals of the institution in a changing market. The basis of achieving a high level of competitiveness therefore needs to begin with an intimate understanding of drivers of change, both internationally and locally.

### 2.1 Global

#### 2.1.1 Rapid Economic Development of Developing Economies (China & India)

Growth in demand for university places is largely dependent on growth of per capita income. Due to the rapid economic development (and in turn growth in per capita income) in a number of developing economies such as China and India, there has been growing global demand for university places over the last twenty years. This demand has been met both through growth of local institutions in developing countries, and by accessing international tertiary education services provided by developed countries.

#### 2.1.2 Shift to a Knowledge Based Economy

The progressive shift from a resource based economy to a knowledge based economy has resulted in unprecedented demand for university graduates and more specifically for research graduates.

#### 2.1.3 Globalisation

Due to globalisation there has been increased internationalisation of Higher Education over the past twenty years. The major trends that have shaped the internationalisation of higher education are:

- Increased number of students studying outside their own country
- Staff mobility has risen
- Increased mobility of institutions (through the establishment of overseas branch campuses and distance education)
- International research collaboration has increased

#### 2.1.4 Commercialisation of Research

Universities traditionally have had two roles, teaching and research. As a result of the shift to a knowledge based economy, a third role for universities has emerged in regional and national innovation systems. Internationally universities have begun to play a key role in regional and national innovation systems as an important source of knowledge, commercial value, and as an innovation partner for industry.<sup>1</sup>

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<sup>1</sup> Innovation U: New University Roles in a Knowledge Economy, Tornatzky, Waugment and Gray



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## **2.2 Australia**

### **2.2.1 Declining Public Funding**

Until now Australian universities have survived off a strong research reputation accumulated on the basis of public investment during the period of 1960-1985.<sup>2</sup> Since then, the Federal government has reduced funding for universities and encouraged them to obtain external income from market-related activities. This led to a shift in the focus of many Australian universities away from research based activities toward predominantly teaching based activities with an emphasis on student volume and revenue generation. Consequently, Australian universities have suffered declining research capacity, fading research reputation and downward pressure on quality standards.

### **2.2.2 Internationalisation**

Australian universities internationalised very rapidly from around 30,000 (Equivalent Full-time Student Load) in 1992 to over 172,000 (EFTSL) in 2005. By 2005, international students accounted for around 26% of total student load in Australia.<sup>3</sup> The rapid internationalisation was a result of both increased globalisation and the need to generate external income. Foreign student education in Australia is a commercial activity designed to generate revenues. In addition to attracting a large number of students to domestic campuses, Australian universities have further expanded their market by establishing campuses overseas.

Currently, education is Australia's third largest export sector, worth an estimated \$12.6 billion in 2007<sup>4</sup>. Higher education is the largest contributor representing around 60% of education exports. Despite having the world's largest proportion of international students in higher education, Australia lags behind in its proportion of international students in research programs. Australia is failing to attract high quality international research students despite the strong demand for this type of education. This is mainly due to intense competition from institutions in the United States and United Kingdom. There is evidence to suggest that growth in international student numbers in Australia is plateauing, a trend that threatens the future growth in revenue for Australian universities.

### **2.2.3 Lack of Innovation**

To date Australia has failed to successfully establish a wholesale link between universities, research institutions, industry and government. Such a link would establish a national innovation system that produces commercial outcomes that result in the development of the world's best industrial agglomerations and clusters with resulting economic benefit to the community.

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<sup>2</sup> Our global position and future potential: The challenges facing Australian higher education. Marginson, S. ATEM Branch Conference, South Australia 26 July 2006

<sup>3</sup> OECD Thematic review of tertiary education; Country Background report, Australia. Department of Education, Science and Training, Canberra, April 2007.

<sup>4</sup> Australian Bureau of Statistics, 2007



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### **3 Problems**

The future supply of qualified researchers in Australia is under threat due to the decline in research degree student commencements and the impending retirement of a generation of researchers and academics.

Australian universities are forced to compete with foreign institutions to attract high quality international students. The declining research reputation of Australian universities undermines their ability to attract these students.

Lack of government funding is forcing universities to generate funding externally. This is predominantly done through the provision of bachelor degrees (mainly in professional areas such as business and information technology) to full paying international students. This lack of funding acts as a disincentive to universities to engage in research activities that may not necessarily generate the same amount of direct revenue, and as result has a higher risk associated with it.

As a result of the growing disconnect between universities, industry and government Australia has failed to establish successful innovation systems on both a regional and national level.



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## 4 Generic Solution

Initially, there needs to be recognition by the Australian tertiary education sector, tiers of government, commercial sector, and general public as to the crucial part in which universities play within a functional innovation generation framework. This acceptance needs to lead to resource allocation aimed at developing world class research and innovation universities in order to attract the human, intellectual and financial capital that is required within a knowledge-based economy, and:

- Counter the traditional view that higher education is only a population-driven export commodity and encourage foreign institutions to establish branch campuses in Australia
- Undertake research that is relevant to the region in which the University is operating in order to maximise the economic benefits to the region
- Focus on engaging effectively with the private sector to stimulate excellence
- Encourage international research collaboration
- Shift away from a broad scope curriculum to a more specialised scope
- Develop institutional strengths in collaboration with key local and regional industries
- Encourage research that is driven by specific industry needs to improve the potential for commercial outcomes and application
- Create processes to streamline the commercialisation of university research outcomes

### 4.1 Benefits

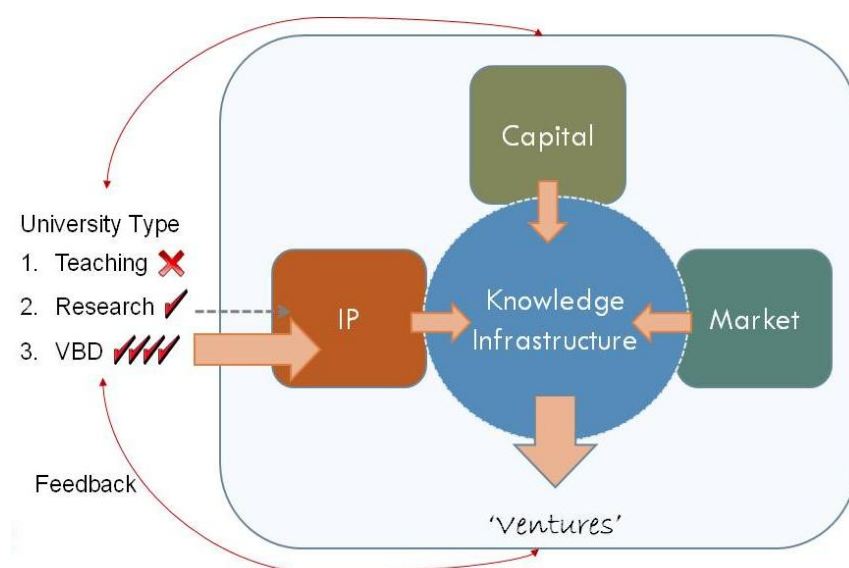
There are numerous benefits resulting from the establishment of world class research and innovation universities, including:

- Creation of strategic employment opportunities
- Gains from innovation
- Improved industry productivity and competitiveness
- Contribute to economic development locally
- Increased attractiveness to international students
- Knowledge transfer through research collaboration with international institutions

## 4.2 How it Works

Currently Australian universities typically judge economic impact based on attraction of staff and students and the expenditure that such activity will bring to the local economy, i.e. treating university infrastructure in much the same manner as a shopping centre. In the model displayed below in Figure 1. the university is intergrated into an overall piece of knowledge or innovation infrastructure that is made up of intellectual property generated by the university (measured through patent generation) , entrepreneurs operating within the market, and capital from private and public sources.

**Figure 1: Venture by Design University**



**Source:** Pracsys Modelling

While the above model may be perceived to be high risk and there may be a considerable time lag before the true economic benefits to the region are realised, the potential economic benefits of this model are far greater than that of the traditional model. If the university integrated into the innovation system it will be able to directly contribute to economic development through the generation of strategic employment, the commercialisation of intellectual property and generate improvements in the productivity and competitiveness of industry.



## 4.3 Case Studies

### 4.3.1 Massachusetts Institute of Technology (MIT)

Massachusetts Institute of technology is a private research university located in Cambridge, Massachusetts, United States. MIT is world class teaching and research institute with a strong emphasis on scientific and technological fields. MIT has been responsible for numerous discoveries and advances across a range areas and has pioneered research collaboration with other universities, government and industry.

In addition to carrying out world class education and research the university has one of the most active technology transfer offices, the MIT Technology Licensing Office. The office focuses on transferring the results of MIT research into a commercial application via technology licensing. The MIT Technology Licensing Office identifies technologies that would be suitable for start up and then introduces the technology to potential investors.

The table below outlines the results of MIT Technology Licensing Office for the 2008 Fiscal Year.<sup>5</sup>

| <b>MIT Technology Licensing Office Statistics for Fiscal Year 2008</b>      |     |
|---|-----|
| Total Number of Invention Disclosures                                       | 522 |
| Number of U.S. Patents Filed  | 282 |
| Number of U.S. Patents Issued   | 122 |
| Number of Licenses Granted (not including trademarks and end use soft ware) | 68  |
| Number of Trademark Licenses Granted  | 19  |
| Number of End-Use Licenses Granted  | 15  |
| Number of Options Granted   | 30  |
| Number of Companies with Minimum of \$50K of other funding)                 | 20  |

<sup>5</sup> MIT Technology Licensing Office statistics for fiscal year 2008, [http://web.mit.edu/tlo/www/about/office\\_statistics.html](http://web.mit.edu/tlo/www/about/office_statistics.html)



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### **4.3.2 Georgia Institute of Technology**

Georgia Institute of Technology (Georgia Tech) is a public research university located in Atlanta, Georgia, United States. The university is a national and international leader in scientific and technological research and is widely recognised for its programs in engineering and computing.

In addition to its traditional roles of teaching and research, Georgia Tech focuses heavily on industry partnerships and economic development activity and has an estimated \$3.9 billion annual impact within the state of Georgia. Georgia Tech's Innovation Enterprise Institute is one of the most comprehensive university-based programs of business and industry assistance, technology commercialisation and economic development. The services provided by the institute include:

- Commercialisation Services - provides services to assist in the commercialisation of new research and technology. Services include evaluation of the marketplace potential of research discoveries, recommendations on a pathway to commercialization and assist in the formation startup companies.
- Entrepreneur Services - provides programs to support the states entrepreneurs. Programs include Small Business Innovation Research (SBIR) Program, The Advanced Technology Development Centre (ATDC) and the Georgia State-wide Minority Business Enterprise Centre.
- Industry Services – provides services to improve the competitiveness of Georgia's business and industry. Services include direct technical and engineering assistance, continuing education courses, facilitation of networks, and connecting companies to Georgia Tech resources.<sup>6</sup>

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<sup>6</sup> Georgia Tech Innovation Enterprise Institute, <http://innovate.gatech.edu/>



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## 5 Specific Solution

- Identify and quantify potential markets (both domestic and international) for specific education and research products (e.g. demand for education and research into sustainable agriculture production)
- Identify locations that would have a comparative advantage for the specific field of study (e.g. research in sustainable agricultural may derive and advantage from locating in a peri-urban environment close to the agricultural industry)
- Identify foreign universities that have world class expertise in the specific field of study and an interest in establishing a foreign branch campus
- Develop a portfolio of institution attraction means through which to attract target institutions



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## 6 Call to Action

In order to remain internationally competitive and attract the human, intellectual and financial capital that is required within a knowledge-based economy, specialised education and research facilities need to be developed in Australia by either domestic or foreign universities. The State Government needs to identify areas of study for which there is significant local and international demand and that would derive a comparative advantage by locating in Western Australia. The state government should also examine the possibility of attracting a foreign university with a world class research reputation to establish a branch campus in Western Australia.