

# Opportunities and challenges for Queensland in the Asian century: the case of tertiary education

## Fernberg Lecture

Professor Peter Coaldrake AO

22 November 2011

- Professor Peter Coaldrake is Vice-Chancellor of QUT. He is Chair of the OECD's Institutional Management in Higher Education (IMHE) Programme, and recently completed a two-year term as Chair of Universities Australia
- The contribution of Dr Lawrence Stedman (Principal Policy Adviser, QUT Chancellery) in the preparation of this paper is gratefully acknowledged

Queensland has never been a closed State; it has a long history of rich interactions with the wider world, from the gold rush days through to the Smart State. The extent of these interactions was outlined by the Governor, Her Excellency Penelope Wensley, in the inaugural Fernberg lecture. In more recent times the elephants in the room have been Asian, and in the last year's lecture, Stephen Robertson, as Minister for Natural Resources, Mines and Energy and Minister for Trade, highlighted the ongoing resources boom and rising demand in Asia as factors which will feature prominently in shaping Queensland's economy. He also drew attention to the work the Queensland Government has been doing in seeking to promote a more diversified and technology-intensive economy, particularly through the Smart State strategy, and how the Government was looking to invest in ways by which we could deal with the future challenges of climate change and preparing for a post-mining boom Queensland.

In this lecture I wish to illustrate the impact of international forces on another sector of the Queensland, that of tertiary education, and higher education in particular.

Over the past two decades there has been a general shift in the profile of the Queensland economy, with agriculture, manufacturing and trade giving way to growth in mining and housing-related activities, particularly over the past decade, while services such as health and education have also grown in importance. While mining heads Queensland's list of export earners, education and tourism have overtaken earnings from other commodities such as beef or copper, and for every person employed in mining, three are employed in education and more than four in health and social services. As the population ages we can be fairly certain that growing demand for various health-related services will join death and taxes as part of life's inevitabilities.

Education has increased its share of employment in Queensland, though not as strongly as health. It shares many features in common with health, particularly at the higher education level. Universities and hospitals are both institutions which rely on the expertise of relatively autonomous professionals, and both sectors are growing in demand and cost in ways which pose increasing concern about public finances and the balances between what individuals should pay and what the public can afford. Viewed from the perspective of international trade, education is Queensland's third largest export earner.

An account of the impact of international forces on the higher education sector will therefore hold lessons for Queensland more widely, and so it is with that in mind I intend to provide some brief remarks on the ways in which Queensland's universities have changed in the course of growing exposure to the wider world.

One of the most prominent changes has to do, of course, with international students. In what has been dubbed a shift "from aid to trade" there has been an enormous growth since the early 1990s in the provision of full-fee-paying education services to overseas students. By 1996 just under 8 per cent of students in Queensland universities were from overseas, a proportion which rose to 12 per cent in 2000 and is now around 26 per cent. Nationally the growth was slightly faster,

with a couple of universities now being comprised of a majority of overseas students (including both onshore and offshore). Much of the recent growth has been due to the rise of China and India (the latter particularly for VET), which have rapidly supplanted Malaysia and Singapore as the main source of international students into Australia.

Last year Queensland's universities hosted here more than 51,000 students from around the globe, and delivered education offshore to a further 4,000. The benefits of this activity clearly go beyond the directly economic. Hundreds of thousands of people have studied and lived in Queensland and then gone on to their own careers, many in prominent government and business positions. The foundations laid by this activity are enduring and will underpin strong international links between this State and the rest of the world, and East Asia in particular. But in economic terms the education of overseas students has had an undeniable impact.

Over the past fifteen years, domestic student numbers have increased by around 50 per cent, while fee-paying overseas student numbers have increased by more than 500 per cent. This growth has fundamentally changed the finances of all Australian universities, helping to sustain them through periods of increasing tightening of public funding for domestic students, but exposing them to the vagaries of an international market. Even faster growth has occurred during the past decade in the VET sector, with international student numbers increasing by 55 per cent in Queensland VET institutions between 2005 and 2009, the great majority involving Indian students.

Volatility has certainly struck home in recent years. Along with other non-mining export-oriented sectors, the appreciation of the Australian dollar has eroded our price competitiveness, while negative publicity involving attacks on Indian students has seen the numbers of students coming to Queensland from that country fall, with China taking over from India as this State's principal source country. We have also recently seen major reforms to student visas, which have created uncertainty for potential students before being recently settled down. In addition as part of the fallout of the ongoing global financial crisis many public universities in countries such as the UK and the US have experienced reductions in income, and are seeking to move more aggressively into the recruitment of overseas students. The United States in particular has until relatively recently been slow to move but the number of Chinese students studying there is increasing rapidly, up by 30 per cent in 2009-10.

For Australian universities, this "perfect storm" of factors has resulted in significant falls in overseas activity and income, and the impacts are only beginning to be felt.

Over the past decade Australian universities have also been more explicitly placed within the international scene. The rise of international university rankings has been driven in part by mobile students who want more information, in part by publishers and other agencies looking for a new market opportunity, and in part by governments wanting to benchmark their higher education systems. One of the more influential and reputable ones was developed in China in 2003, when the

Shanghai Jiao Tong University compiled data on university research performance across the globe in order to find what China needed to do to develop “world-class universities”. Other rankings have attempted to broaden the base by looking at teaching and other facets, the main two having evolved since 2002 from the UK Times Higher Education partnership with global education company Quacquarelli Symonds (QS). Since 2009 the Times has parted from QS and it now issues a ranking in partnership with Thomson Reuters while QS has continued to develop and publish its own system. However the limited and subjective nature of much of the data for both groups means that their rankings are volatile and still struggle to establish credibility below the very top-ranked institutions.

Australian universities are also keenly aware of the importance of international standards for both their international and domestic students as expressed by professional accreditation and registration requirements. These are discipline-specific and only in a few cases are they global in nature, but there is growing interest in developing standards more broadly and some regional accreditation schemes have been developed in areas such as Business, with the leading ones being the Association of MBAs (AMBA), the European Foundation for Management Development (EQUIS) and the US-based Association to Advance Collegiate Schools of Business, International (AACSB). I am happy to say that QUT’s Business School was the first in Australia to secure accreditation from all three.

The pursuit of “world class” status has gathered momentum in line with university rankings, as institutions compete for top talent within and across their country borders, and as many governments look to research-intensive universities to propel them forwards in what has become widely known as the “knowledge-based economies” of the future. Some of the sums invested in the elite end of university development are striking. China, South Korea and Singapore have all dedicated large sums to creating “world-class universities” and “education hubs”, while in Saudi Arabia, King Abdullah has provided a \$10 billion donation to set up a university of science and technology which seeks to attract the world’s top minds to build a science powerhouse in that country. Even in Europe, where equality among universities has been the norm, changes are afoot. This year France announced a 7.7 billion euro program to establish a handful of world-class universities, and Germany has set aside 19 billion euros for a similar initiative. Even in Italy, whose former Prime Minister once said “why do we need to pay scientists when we make the best shoes in the world?”, a billion euro package to develop universities in the country’s south has been announced.

At times the reaction to rankings has been excessive. Late last year the Danish Government proposed new immigration rules for reunited families which would favour candidates who graduate from the world’s top 20 universities according to one of the rankings systems, and similar moves have been made by some countries seeking to restrict support for students studying overseas to those attending highly ranked institutions. More significantly, the ability of universities to attract top students and research talent will be influenced by international rankings, and success will breed success in the future. The stakes are increasingly high, and the

standards are global not local.

The challenges here are as much for governments as they are for individual universities. The international scene shows that despite economic troubles, many countries and regions are competing vigorously in a knowledge-based arms race. This is particularly true of East Asia, and Australia needs not only to sustain its own domestic momentum, but also to position itself as a key player in this new environment. Even the country with the greatest concentration of intellectual firepower and entrepreneurial activity is concerned about the impact of these changes. In his State of the Union address delivered early this year, President Obama said:

The rules have changed. In a single generation, revolutions in technology have transformed the way we live, work and do business. Steel mills that once needed 1,000 workers can now do the same work with 100. Today, just about any company can set up shop, hire workers, and sell their products wherever there's an internet connection.

Meanwhile, nations like China and India realized that with some changes of their own, they could compete in this new world. And so they started educating their children earlier and longer, with greater emphasis on math and science. They're investing in research and new technologies. Just recently, China became home to the world's largest private solar research facility, and the world's fastest computer.

So yes, the world has changed. The competition for jobs is real. But this shouldn't discourage us. It should challenge us.

At the end of 2008 the Bradley Review had also pointed to the likely continuing shift of employment demand and opportunities to higher levels of skills, presenting findings from Access Economics which projected growth in jobs requiring tertiary education, and showing that under settings in place at the time that there would be shortfall in the supply of graduates in coming years. Workforce projection is an inexact science, and we have had trouble in the past assessing skills shortages over medium time periods even in relatively controlled areas such as nursing and school teaching. There are also obvious perils in the way of any detailed forecasts involving complex globally affected economies: in 2006 the then Federal Department of Employment and Workplace Relations issued a publication entitled *Workforce Tomorrow* which noted that its projections should be thought of as scenarios rather than predictions, adding "in particular, it is assumed that there will be a fairly benign economic environment over the next five years, with no major disruptions to the economy." This was, of course, little more than a year before the GFC hit.

Despite this uncertainty, we need to prepare as best we can for anticipated skills shortages, and respond as best we can to the fluctuating signs of shortages at present, and all universities are working within the limitations of the resources available to them to establish effective connections with employers, to inform students, and to work with policymakers. Higher education has a spectrum of links between their education programs and workforce needs, and the long-term nature of those programs means we need to ensure that we get the fundamentals right,

which involves a balance and interplay between academic depth and direction and more immediate skills needs for students. For its part, the Bradley review focussed less on particular areas that might need increased future graduate supply and more on increasing the overall supply.

Australia has set ambitious national targets for participation and attainment, and we have increased investment in research and development, but we must be wary of complacency and assuming that the job is now done. Australia has been content with middling support for tertiary education by world standards, but we cannot expect to secure the future we want and expect while allowing our core “knowledge infrastructure” to erode. The development of scientific and technological knowledge is a particular focus of much of the world’s expansion in tertiary education, and both here and in countries such as the US and UK there is considerable concern about declining interest from students in studying science, engineering and mathematics. Here, as in the case of skills shortages, student demand does not seem to be in line with stated needs, and easy answers are not available. Much has been done to stimulate interest at school level, and universities are active players in this, and such efforts need to be sustained, well-supported, evidence-based, cross-sectoral and well coordinated.

Global factors have already had major impacts on Australian universities, but we may only be in the early stages of a wider transformation. Last year two UK academics, one of them a vice-chancellor, published a book on globalisation of higher education which predicted that by 2025 internationalisation will have sharpened the hierarchy in world higher education, with a handful of university ‘transnational corporations’ in the highest tier alongside private firms, and local community college-style institutions in the lowest. Such forecasts parallel drastic scenarios for universities put by some eminent folk outside the higher education sphere. In 1997 the management guru Peter Drucker predicted that within thirty years the traditional universities would disappear, outcompeted by virtual agencies using technology to deliver high quality flexible online products. In August last year Bill Gates said that five years from now on the Web for free students will be able to find the best lectures in the world. It will be better and cheaper than any single university, he said, and colleges need to be less place-based, though he did concede that they might have a competitive advantage in providing a place for partying.

Technology has undoubtedly wrought extensive changes on higher education, as it has in almost every other part of the economy. As a broad generalisation, technology can improve productivity by enabling greater communication and automating many labour-intensive tasks, but relatedly it can also have dramatic impacts on established models of work. It lends added impetus to the tendency for globalisation to shift tasks to lower cost provision, and provides greater rewards for those skills which can add value. We have seen many service industries use technology to outsource various functions, and over time this has moved from relatively low-skilled jobs such as call centres through to some professional activities such as IT support and some legal services. As yet it has supplemented

rather than replaced most work in higher education, but this may not continue. One important driver will be demand for tailored education for corporate clients and wider programs for working adults. Here there are strong emphases on quality, cost, measureable outcomes in the workplace and convenience, and technology is integral to delivery. More broadly, in Australia we are reaching a point where the increasing cost of education is placing great pressure on the public purse, as is the case with health. Technology has been a major player in both sectors, but they remain labour-intensive and have limited scope for incremental gains in productivity, in other words, costs continue to rise. Such a situation is of course not unique to Australia, and in the United States there is increasing talk of a “higher education bubble” brought about by rising tuition fees and static returns to those attaining degrees.

Lest this picture appear too gloomy, I should point out that universities are resilient and adaptable institutions. Queensland’s universities feature well in the international rankings: there are many thousands of universities worldwide and four of Queensland’s eight feature in the top 500 according to the various ranking schemes.

Those who predict dire changes arising from virtual delivery tend to underestimate the value that comes from personal contact, and the appreciation students have for this. Perhaps most importantly, increasing global mobility and technological development have greatly enhanced the scope of what we can do. Knowledge is not a zero sum game, and the rise of new world-class universities can and will benefit the rest of the world, particularly as they are based on the pursuit of basic knowledge which can be shared among a global community of researchers. Over coming years there will be a major change in university staffing as baby boomer academics retire, a phenomenon which will be particularly acute in some disciplines. Replenishment of the academic workforce will rely heavily on international mobility to supplement local production of PhD graduates.

Global forces are thus both the source of major disruption and challenges to local universities, and part of the solution to those challenges. However seizing the opportunities requires active involvement in the international arena, deep understanding of how other cultures operate, and constant efforts to keep up with, and preferably exceed, stringent global benchmarks.

This is why internationalisation in higher education must be about much more than the recruitment of overseas students, the offering of languages or the opening of offshore campuses. Those imperatives about connections and cultural understanding not only apply to universities as operators in a global market, but also to our graduates as they go out into the world. There is much more that Queensland’s universities need to do as they widen their involvement with the rest of the world. Despite many years of good intentions, we have only made partial progress towards the more in-depth internationalisation that has been intended ever since the expansion of the overseas student market in the early 1990s. We want to instil global perspectives more deeply in our graduates, encourage greater interactions between local and international students, and develop deeper

understandings of how we can and should interact with people from other countries and cultures. Efforts to encourage domestic students to study abroad will be an important part of this.

It is also essential that we send the right messages to the rest of the world that Australia is a welcoming and high quality destination for international students. Our visa rules are an important element of this, and the recent reforms arising from the review by Michael Knight of the Student Visa Program are very welcome. These reforms involve streamlined processing of visas and granting of work rights. Work rights will now range from increased entitlements while studying through to two to four years post-study work rights for graduates. The Knight Review rightly pointed out that in an increasingly competitive world environment, the ability to gain practical work experience will be very attractive to overseas students and a key competitive advantage for Australian universities.

There is growing recognition that Australia more broadly needs to move to a deeper level of understanding and engagement with the Asian region. In September the Prime Minister announced that the Federal Government had commissioned a White Paper on Australia in the Asian Century, to be led by Dr Ken Henry. She set out powerfully and starkly the scale of the coming changes that would occur as a result of the development of Asian countries, China and India in particular. While much of this is a familiar story by now, the idea that we can deal with it with business as usual seems to persist for many people. But as the Prime Minister said, Australia hasn't been here before. And while the context she described was primarily economic and demographic, the impact of environmental pressures, resource scarcity and food security add deeper layers of complexity and challenge for the future of us all.

To some extent we have been there before. Globalisation, technological change and resource pressures are not new. In 1920 the economist John Maynard Keynes looked back on the pre-war period noting that "the inhabitant of London could order by telephone, sipping his morning tea in bed, the various products of the whole earth, in such quantity as he might see fit, and reasonably expect their early delivery on his doorstep ... or he could decide to couple the security of his fortunes with the good faith of the townspeople of any substantial municipality in any continent that fancy or information might recommend." This was a time when global communication was entering a new era. Marconi had overseen the first intercontinental wireless message transmission at the end of 1901, triggering a collapse in the stock price of the companies which owned undersea cables. Around the start of the twentieth century there were also echoes of contemporary problems in dire warnings issued by scientific bodies on potential catastrophe arising from the inability of the world to feed itself. The problem was that supplies of nitrogen-based fertilisers were insufficient to keep agricultural production growing at the necessary rate. While nitrogen is abundant -it makes up nearly 80 per cent of the air we breathe -it is very stable as a gas, and what was needed was a way of converting it to a form suitable for agricultural purposes. The problem was eventually solved almost exactly a century ago when the German chemist Carl



Bosch delivered commercial quantities of ammonia using a process developed by his compatriot Fritz Haber. Around one third to one half of the world's population now relies on food produced with the aid of synthetic fertilisers derived from the Haber-Bosch process.

A century later what is different is that globalisation is not just about those enjoying the fruits of empire. The scientific and technological challenges facing a planet with 7 billion people, rising to more than 9 billion within a few decades, are also much larger and more complex than those facing 2 billion. Indeed the availability of nitrogen-based fertilisers has created its own problems, with agricultural run-off contaminating water, acidifying soils and contributing to greenhouse gas emissions. Worldwide, agriculture accounts for 15 to 20 per cent of total greenhouse gas emissions, including nitrous oxide arising from the use of nitrogen-based fertilisers. Science and technology offer us great prospects for tackling the problems we face, but there are almost always unintended consequences, which in turn require us to continue adapting and innovating.

Governments are well aware of the necessity for innovation. The Queensland Government's Smart State strategy has been a particularly welcome and important source of support for early stage development of knowledge-based industries, and it has assisted universities and other research organisations to build programs in promising areas of research and development. Of course research is not the same as invention and invention is not the same as innovation. Innovation is about what people do: how they work and what they buy, and the pathways to successful innovation are not able to be mapped in advance. We need targeted research investment, but we also need a broad base of research activity because Queensland is one player, and a small one, in the global knowledge business. Sometimes innovations develop from small advances in knowledge, or applications of what is already known to new situations, and often important research findings emerge from unexpected quarters. Researchers in Queensland are part of global networks in their field, and many are closely connected to local businesses and enterprises. The Smart State Strategy rightly provides support both for research in selected areas and to encourage startups and links between researchers and industry, but fundamental change must come from wider cultures of collaboration and networking, at local and international levels.

The idea behind the Fernberg lecture series is important because Queensland needs to understand its place in the world if we are to adapt to it in the best way possible. Some of the challenges we now face, and those we will face in the years ahead, are local, but international forces will drive and enable change in our institutions, in our cultures, and in our individual circumstances.

The previous Fernberg addresses both pointed out examples of the very positive developments in Queensland which provide concrete examples of how we have become more multicultural. They also pointed to the contrasting history of One Nation which originated in this State. While some might delight in the abstract thought of "creative destruction" as part of innovation and economic development, the reality is that social shifts and economic dislocation can hurt people and can

breed resentment and anger.

However we cannot simply open or shut the door to globalisation at our pleasure, while remaining apart from the mundane flow of goods and services. We will all change and we need to manage the downsides while reaping and sharing the very considerable benefits that can accrue.

More education is often touted as a panacea for issues such as this, and equipping people with the skills to deal with complexity and change must surely be a good starting point. I can also point out that more education is associated with more ease at handling complex problems, and with tolerance broadly defined. But education provides no ironclad guarantees, and the type of education that best equips people to handle complex new challenges is costly to deliver well, and at university level the focus must also be on depth within a discipline or profession.

We need to think about the distribution as well as the depth of education we want, and for Queensland the national policy focus on both equity and overall participation has particular resonance. We are moving to a more open market in undergraduate university education from next year, with places available for all who are considered able and who apply. However we know that entrenched patterns exist among different parts of society when it comes to seeking more education, and market mechanisms are unlikely to help improve things. Grappling with difficulties in education inequality and aspiration across different levels of education is a formidable task, and one which requires persistence and patience as well as ongoing explicit support. While in only its early stages, a collaborative approach by the eight Queensland vice-chancellors and the State Government is being developed to coordinate work on stimulating interest in tertiary study, and widening the tertiary participation of low-income people and Indigenous people.

All of us can look back on the tremendous changes that have happened in Queensland over the past few decades as it has opened up to the wider world on a number of fronts. Much more change will come in the years ahead and education and research are necessary parts of our ability to adapt and to make the most of our opportunities. Education providers themselves are caught up in the same tides, and the experience of dealing with change in the tertiary education sector suggests that while we ought to be alert to, and deal as best we can with, the risks (including both the risks of some areas proving uncompetitive and also the risks of very rapid growth) we can overall be optimistic about the capacity of people to learn and explore new ideas, and to compete at international standards where we are strong. The experience of the education sector also shows how exposure to the international scene not only provides direct economic benefits, it can also drive improvement of standards and help us to find solutions to some of the social and environmental problems we face.



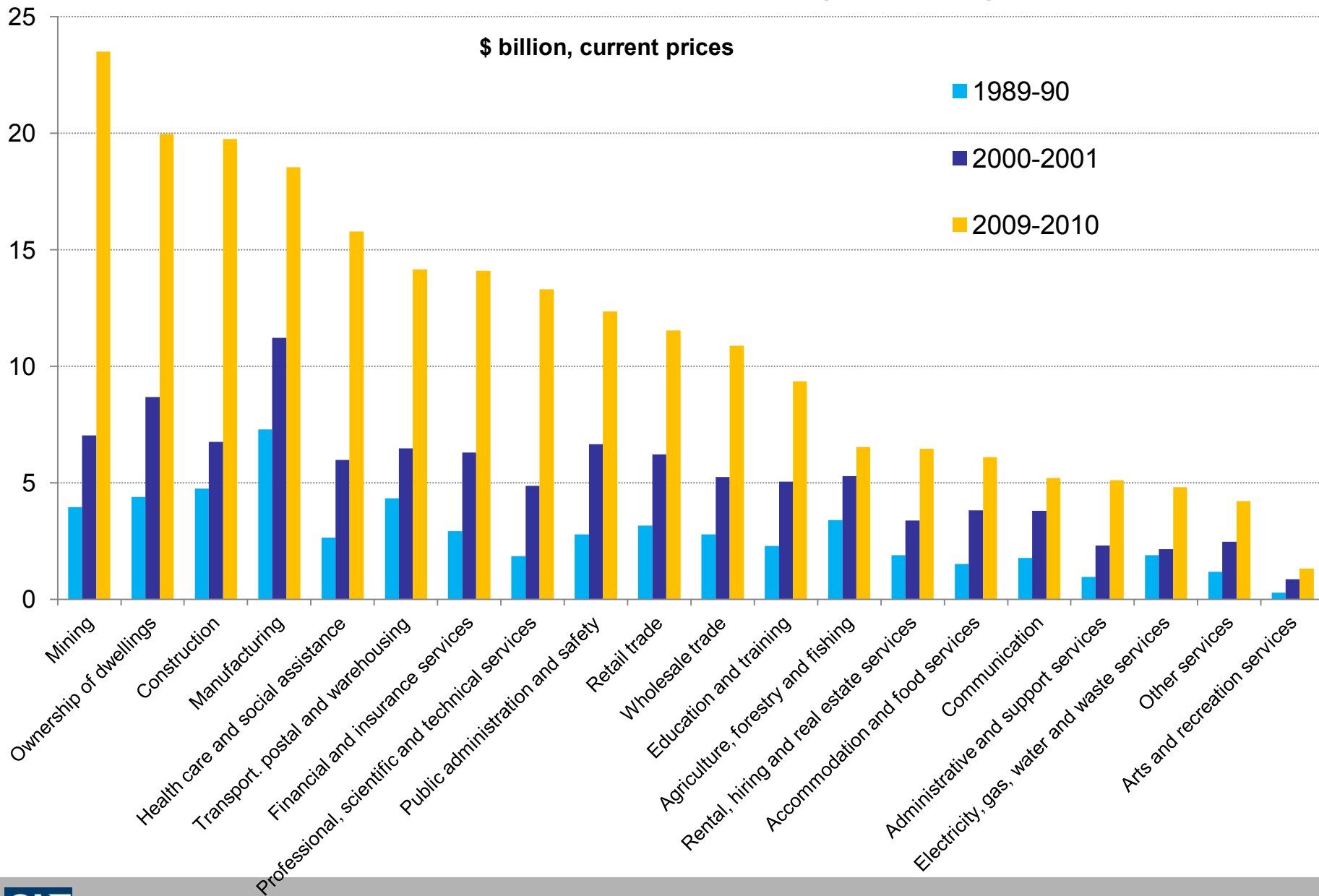
## **Fernberg Lecture**

*Opportunities and challenges for  
Queensland in the Asian century:  
the case of tertiary education*

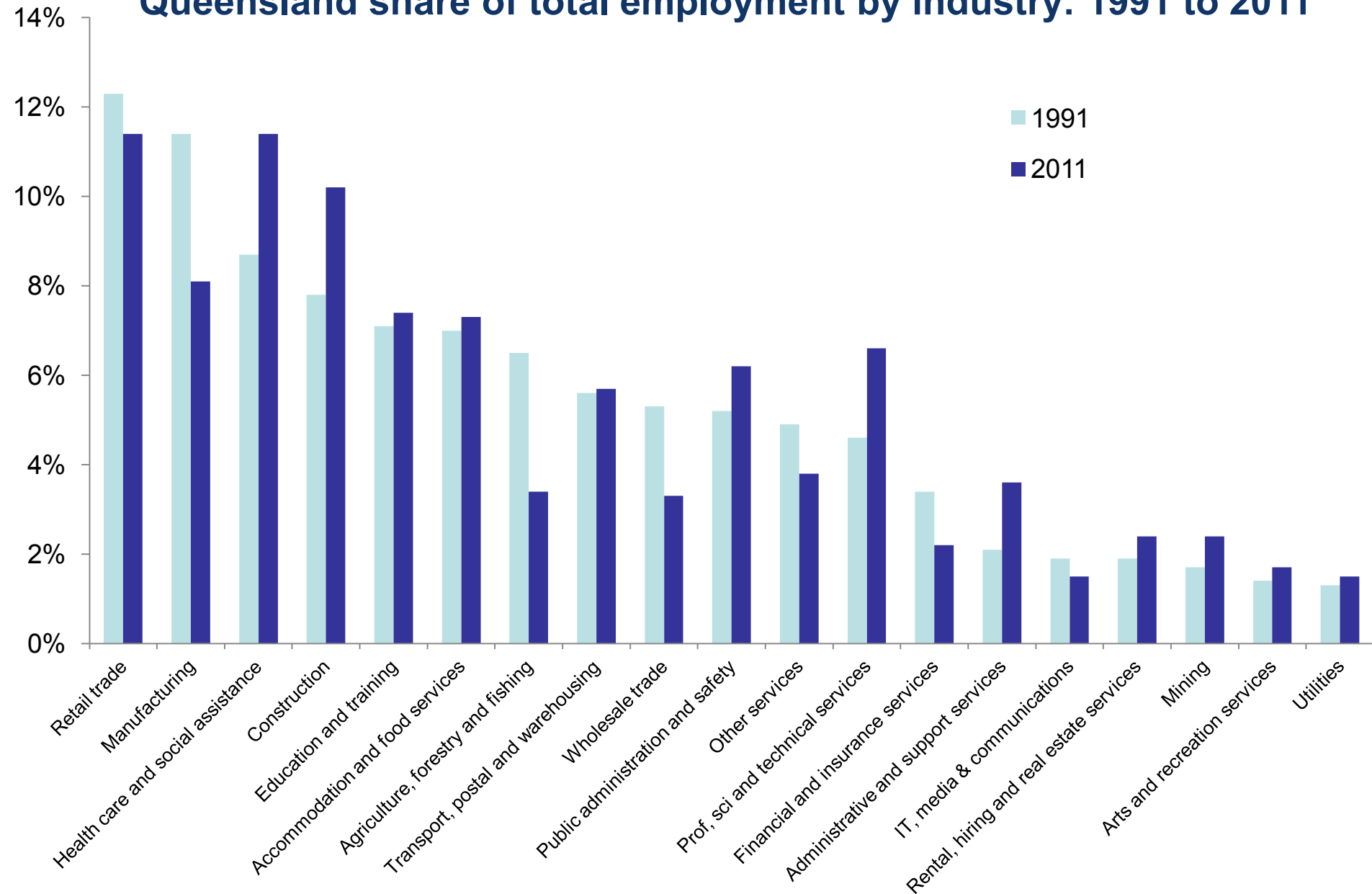
Professor Peter Coaldrake AO  
Vice-Chancellor, QUT

# Queensland Gross State Product by industry: 1990-2010

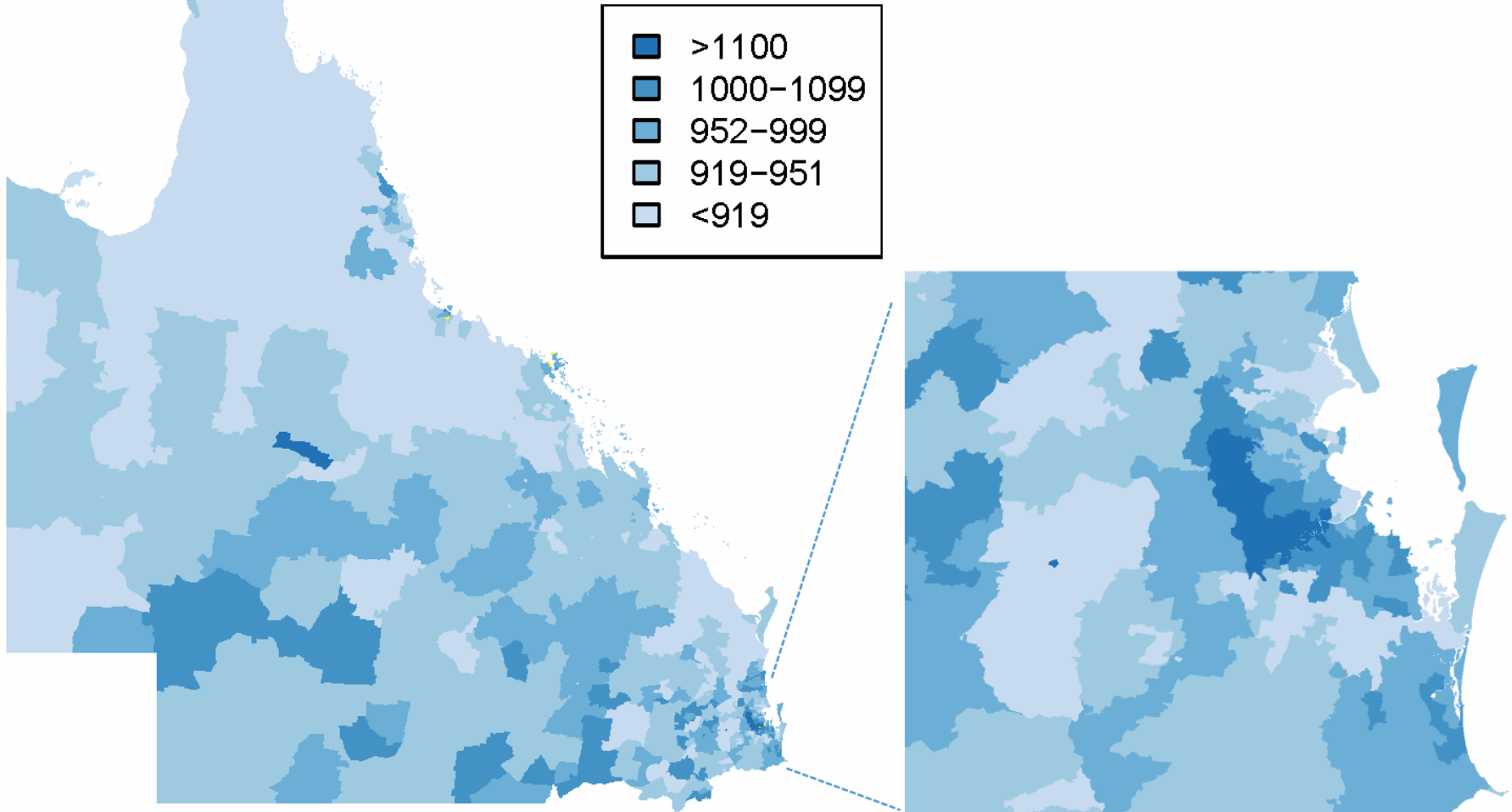
\$ billion, current prices



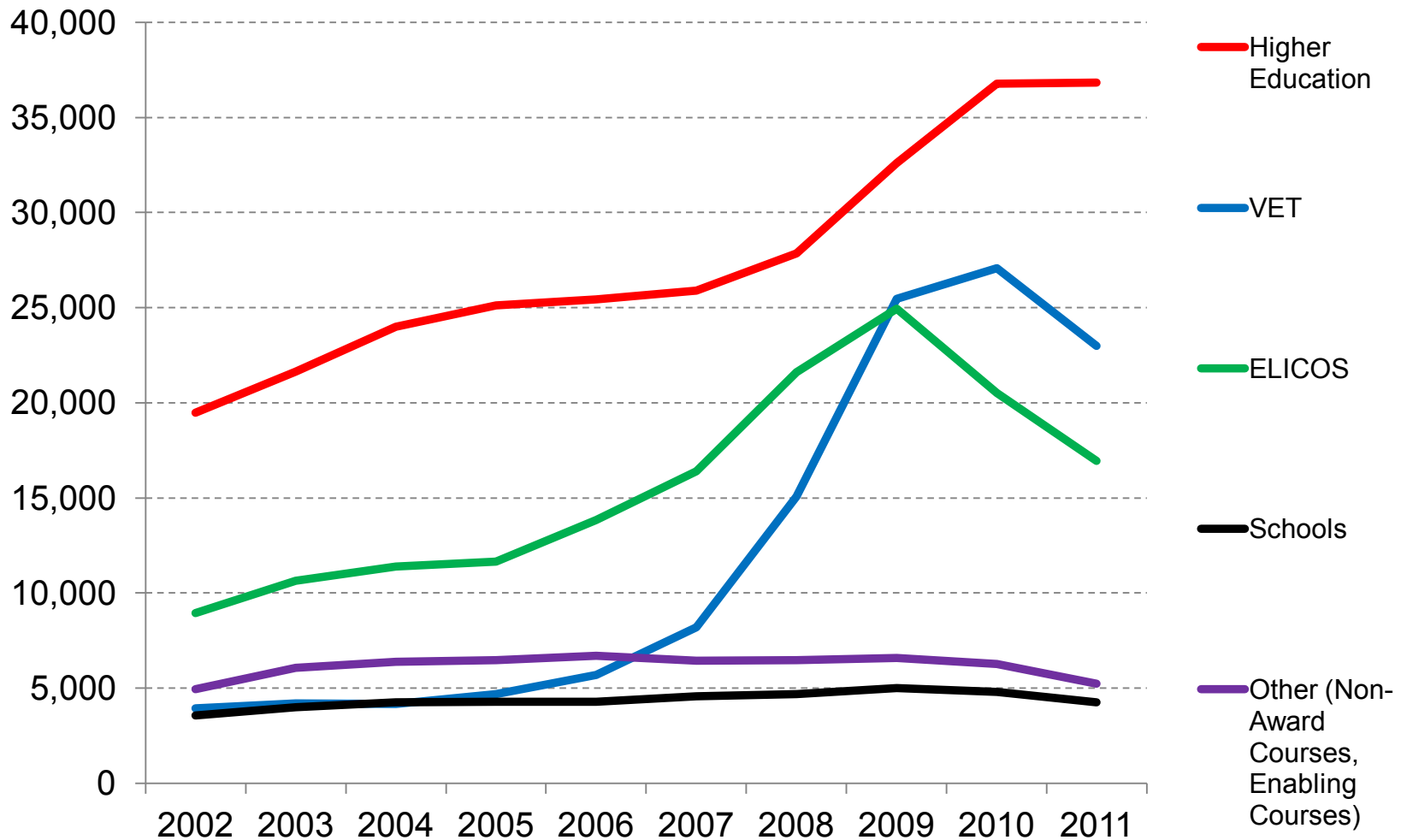
# Queensland share of total employment by industry: 1991 to 2011



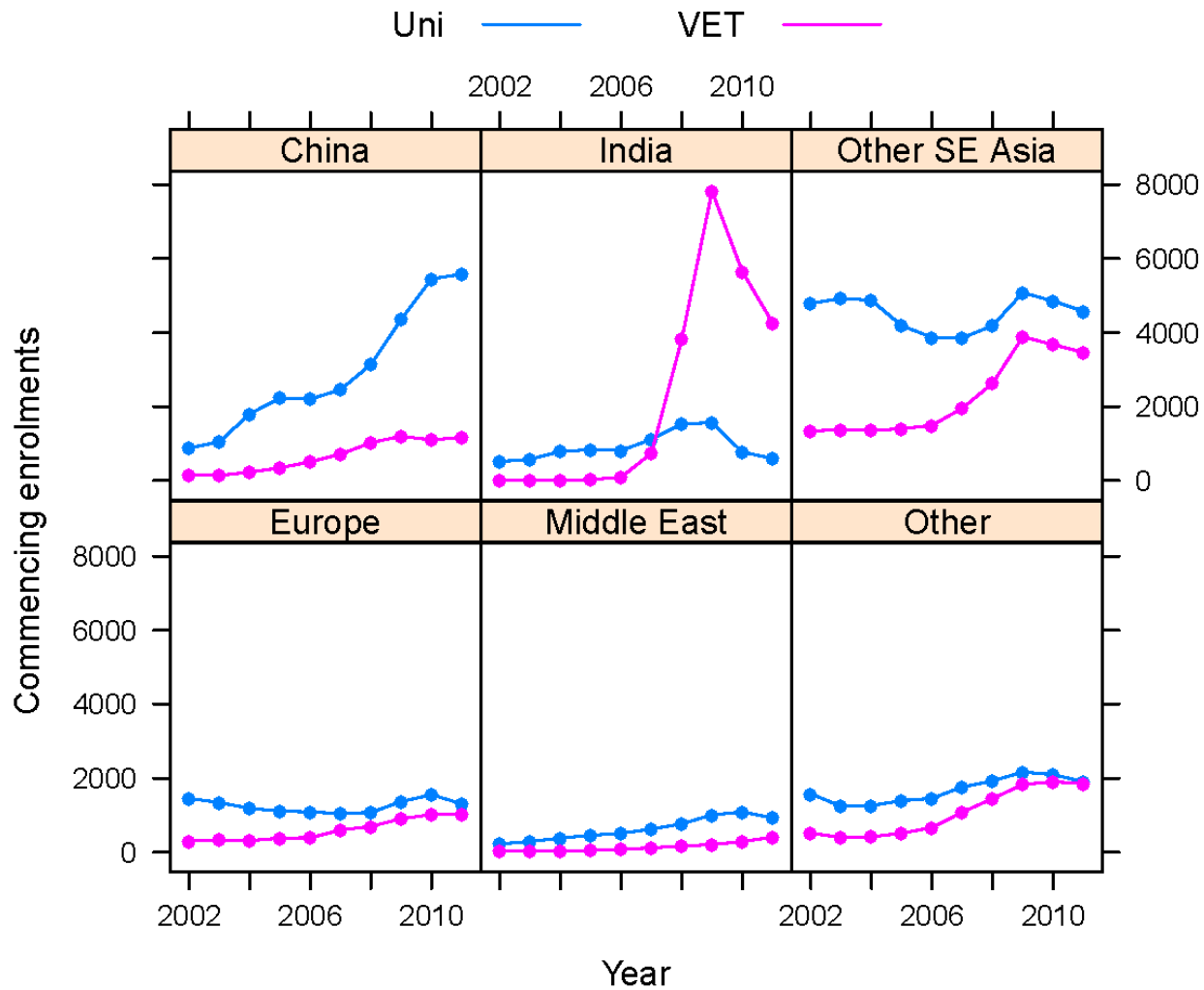
# Queensland index of education and occupation, 2006 census by postcode



# Overseas students in Queensland (September data)



# Queensland commencing overseas students 2002-2011





# Technology around us

- 5.1 billion mobile devices worldwide<sup>1</sup>
- 293 billion emails sent yesterday<sup>2</sup>
- Over 650 million Facebook users<sup>3</sup>
- More kids can play computer games (58 per cent) than ride a bike (52 per cent) or swim (20 per cent)<sup>4</sup>

<sup>1</sup> <http://www.internetworldstats.com/stats.htm>

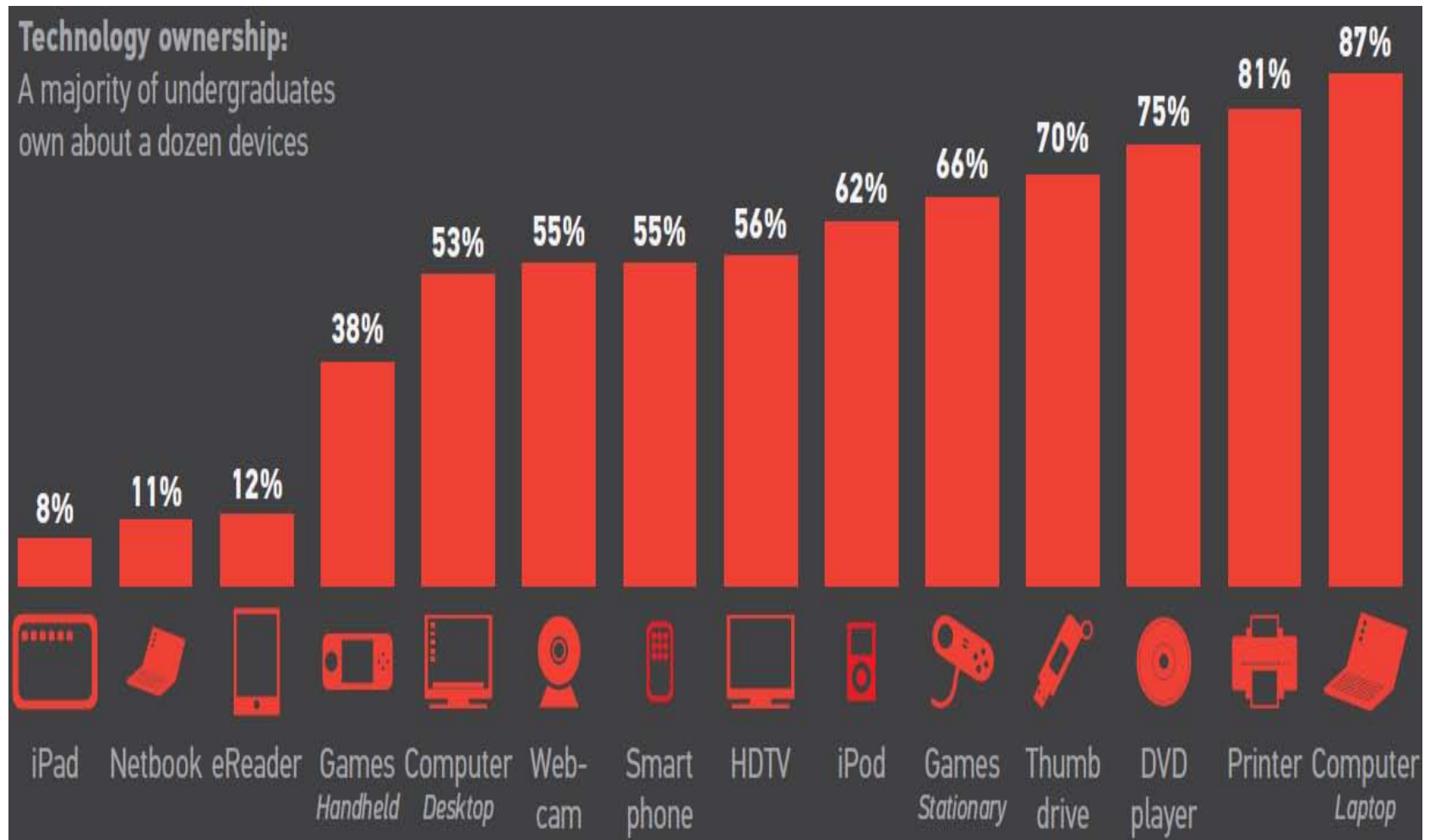
<sup>2</sup> <http://www.gartner.com> - Top 10 Trends and Their Impact on Infrastructure & Operations; APAC Symposium/ITxpo 2011, November 14-17;2011

<sup>3</sup> <http://www.internetworldstats.com/stats.htm>

<sup>4</sup> [http://socialtimes.com/study-more-children-can-play-a-computer-game-than-ride-a-bike\\_b35269](http://socialtimes.com/study-more-children-can-play-a-computer-game-than-ride-a-bike_b35269)

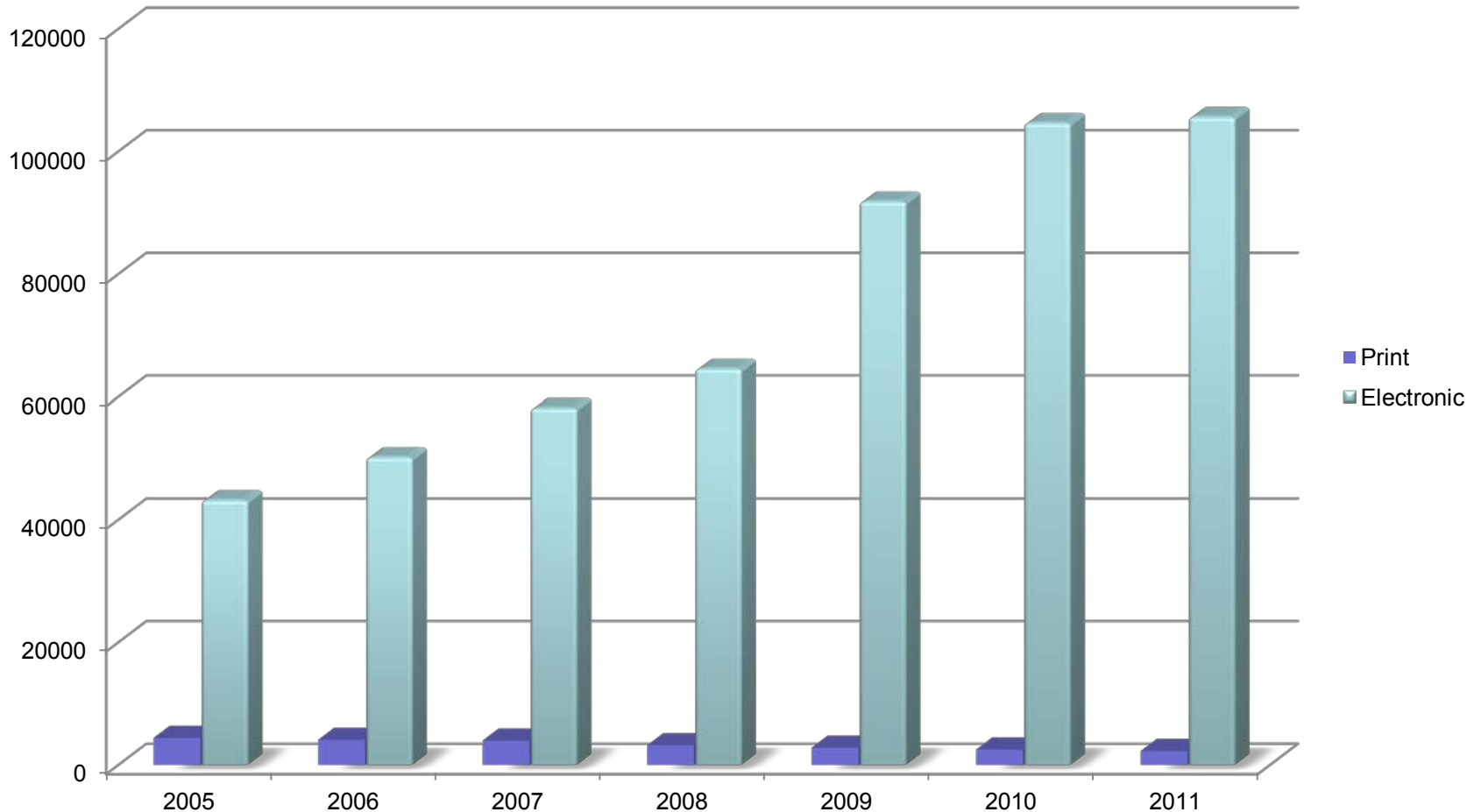
# Student use of technology

(EDUCAUSE Center for Applied Research Survey)



# QUT Digital Library Collections

## Print vs Electronic Journal Subscriptions 2005-2011 (titles)



# QUT – Books and Libraries





## **Fernberg Lecture**

*Opportunities and challenges for  
Queensland in the Asian century:  
the case of tertiary education*

Professor Peter Coaldrake AO  
Vice-Chancellor, QUT