

GLOBAL EDUCATION DIALOGUES SUMMARY

**FROM CATAPULTS TO COMMERCIALISATION:
HOW CAN UNIVERSITIES USE THEIR
KNOWLEDGE AND RESEARCH MORE
EFFECTIVELY?**
DIALOGUE SUMMARY

Global Education Dialogue Summary Report
Prepared May 2015

PHOTOGRAPH CREDITS

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Background

The Global Education Dialogue ‘*From Catapults to Commercialisation: how can universities use their knowledge and research more effectively?*’ brought 114 delegates to Canberra, Australia over 9-10 March 2015.

The British Council partnered with Universities Australia and the UK International Higher Education Unit on design and delivery; and The PIE on communications. The Australian Government, Department of Education and Training provided financial support.

The issue was chosen as a follow-on to the visit to Australia and Indonesia in February 2014 by the then UK Minister for Education and Science, the Hon David Willetts. Regional interest in the UK government’s commitment to the ‘Eight Great Technologies’ and the Catapult centres was furthered as result. The commercialisation of university research is highly topical in Australia and the region, albeit with countries at different development points. While there is a looking to the UK models, the GED provided a platform for deeper examination of issues pertinent to countries in the region and the UK.

The British Council’s Global Education Dialogue (GED) series in East and South Asia and the Americas tackles some of the most challenging issues before universities and higher education policy makers. It leads into the international higher and further education conference Going Global, also presented by the British Council.

The Dialogues bring together leaders, key policy-makers and influencers to debate the challenges and opportunities facing international higher education. Each event provides space and time for participants to explore the shifting international higher education landscape – with its rapidly shifting international higher education landscape.

The Australian GED was for invited guests from Australia, the UK and the East Asia region. A delegation from Brazil also attended, as guests of Universities Australia. In summary, guests were from:

Australia	68%
East Asia region	18%
UK	11%
Other international	3%

Country	Number
Australia	78
UK	12
Hong Kong	4
Myanmar	3
Indonesia	3
Japan	2
Korea	1
Brazil	4
Vietnam	1
Taiwan	3
Malaysia	2
Singapore	1
TOTAL	114

The delegates were weighted towards universities and research centres, with high level policy officials from both industry and higher education/research areas contributing as delegates and panel members. Industry concerns and views were largely represented by business groups and government supported innovation centres.

The British Council commissioned stimulus papers and a detailed research project (examining government policy and the commercialisation of research in Brazil, Hong Kong, South Korea and the United Kingdom) to support the event.

The stimulus papers were:

- *Towards the fully engaged university: the particularly Australian challenge*, Professor Mark Dodgson, Technology and Innovation Management Centre, University of Queensland Business School.
- *Commercialising university research: building multi-focus knowledge hubs and the rise of strategic partnerships*, Tomas Coates Ulrichsen, Centre for Science, Technology and Innovation Policy, University of Cambridge.

The research project was commissioned by the British Council and delivered by EduWorld.

These materials continue to be publicly available at www.britishcouncil.org.au/programmes/education/global-education-dialogues/papers or by contacting the British Council Australia.

The format for the discussion was a series of panels with extensive contribution and discussion from the floor. The programme is attached at the back of this document.

The conversation was wide-ranging. This document pulls out the upper level themes and reports on them as they were discussed. It attempts to encapsulate the direction of the conversation over the 1.5 days of high-level discussion.

The document deliberately does not cover issues that are overly country-specific, such as intellectual property law, regulation or particular incentive schemes.

Delegate comments are in italics throughout but generally not attributed as they have been précised to support a particular theme.



Helen O'Neil, Director, British Council Australia

Executive Summary

The Global Education Dialogue (GED) delegates were actively looking at the impact of commercialisation policies on their university structures and education programmes.

They brought case studies in ways to include business in designing research; how to transfer knowledge to local and international business, especially to smaller enterprises; and how to make degrees, including research degrees, better fit the demand for entrepreneurial graduates able to research (and translate their research) into products and services.

Delegates from universities reported that pressure from governments and other stakeholders to make knowledge exchange a greater priority was universal. Both developed and developing economies were experiencing a continuing shift in employment and investment from a focus on manufacturing to services and high value-added production, and were feeling a concomitant pressure to adapt research and training to reflect this. Tensions between businesses and researchers are long standing and deep in some sectors, but both universities and industry are working to strengthen communication and cultural gaps.

Government policies in commercialisation and innovation are changing rapidly. Given the long development cycle for research discovery into successful new product and service launches, it is hard to evaluate impact and effectiveness of policies across the region and in the UK at this stage. GED delegates agreed with the research findings that stable and long-term policy setting will be important as universities reform, and the ability of innovation systems to support start-ups and spread knowledge is improved.

Key conclusions:

1. We are in a totally international debate

It doesn't matter what the national system looks like, either the university system or, indeed, the dispersal of industry, whether it's largely small and medium, or whether it's largely in mining and medicine. That is not where we are.

Universities and industry are fundamentally in international systems. What national policy is doing is one thing but, we are working in international innovation systems and we aren't geared for them.

Our policy settings for university systems are fundamentally national. They are international only, if you like, at the community of scholar level. The way we perceive to take universities and industry into that international space is something quite new. We are actually talking about a change in the fundamental way we understand what universities are doing.

Professor Margaret Gardner, Monash University

It is a given that many problems are too complex for one country, or even one region, to solve. We will see the emergence of research and commercialisation super-powers in the next decade so there is increased imperative to work with partners we can trust, those who share similar systems, and can share the risk.

Universities hold a unique convening power here. They can draw together powerful global consortia of other universities, research bodies and industry. For example, Cardiff University is leading a developmental consortium of five universities and six companies on the development of an energy 'super-grid' for sharing renewable power across Europe. This is on a scale that no one university or company could do.

More generally, universities are centrally placed as a 'trusted' player between government, industry and society as the range of actors in the knowledge exchange system is acknowledged as broadening beyond industry to NGOs, charities and community groups.

2. Culture is critical – within universities and countries

The commercialisation of university research outputs of any country are directly informed by their particular historical, economic, social and political circumstances. This shapes the cultural acceptability of risk-taking and the nation's entrepreneurial spirit.

This manifests in young people and their willingness to take risks (which is in part informed by levels of student debt and economic outlook on graduating). In South Korea, with success so tied to securing employment with a *chaebol*, 'failure' is not acceptable. Reportedly, the impact of the 2001 tech crash on South Korea's economy is still, 14 years on, limiting entrepreneurial spirit in the country. In South Korean universities also, the linking of prestige and advancement to publication outcomes (rather than industry engagement) continues to remain entrenched.

In Brazil, there is generally a recognisable entrepreneurial spirit amongst young people but this has largely been directed towards retail and hospitality ventures at the SME level, of which very few use university research. Like South Korea, academics are still primarily motivated by publication outcomes.

The culture within universities themselves is critical. Other countries and universities are now rewarding on the three alternate pathways to academic promotion: (1) teaching, (2) engagement, and (3) research (presented at the GED in regards to Taiwan and Australia).

The expectation should be on *all* academics for public engagement, if not always traditional 'commercialisation'. This should be considered as 'knowledge exchange' in the broadest sense.

Similarly, commercialisation should not be considered the exclusive domain of science, medicine and engineering. We need a much better understanding within universities of how different disciplines work and a respect for this. The big challenges can only be confronted if we have good physics, working alongside good mathematics, alongside good sociology and history, for example.

3. The education-research-industry continuum

The importance of the education pipeline in every country's innovation outcomes can not be ignored. Innovation is not separate from research, which is not separate from education. There is a need to see research and its benefits as a system-wide issue, rather than as a set of policies and resources which are particular to the research community itself.

Industry has some of the best basic science problems, and may in fact do basic research better than many universities. Similarly, universities do more in the innovation space than industry may give them credit for. The key is to view university and industry as a continuum. The continued focus on very specific schemes to bring industry and universities together may be missing this bigger point.

4. Stable, coherent government policy

There are multiple drivers of a country's research commercialisation outputs, not limited to:

- The strength of the local economy
- The existence of local manufacturing

- Key sectors within the economy and proportion of SMEs versus large businesses
- University funding models
- Aspirations of young people and the country's entrepreneurial spirit
- The attitude towards, or organisation of, science and technology
- The financial system including taxation
- The availability of private investment funds and access to capital

Changes to government policy in one area necessarily have a knock-on effect to other linked areas. There is particular import to link industry policy with innovation policy. Government policy must be coherent and also accommodate the vastly different time frames for commercialisation between different sectors.

A statement of long-term national government priorities (i.e. the UK's 'Eight Great Technologies' or Australia's five Industry Growth Centre priorities) will always be subject to questioning as to whether they are the 'best' choices. They can, however, be a powerful mechanism and, at the very least, signal national confidence.

Discussion Points

Commercialisation is not innovation.

Research without deep and structural connection to capacity to translate that to outcome is not innovation.

Known mismatches between industry and universities

- There continues to be a lack of alignment between what sectors businesses are directing their R&D expenditure towards, and what sectors universities are directing their research focus towards.

We have built a research profile that is very similar to everywhere else in the world, but that doesn't reflect the corporate and the end user niche in Australia.

- A perception by business that universities are inaccessible, especially by SMEs. Access to universities can be difficult for business even when there are stimuli for doing so, such as tax concessions. SMEs can lack the absorptive capacity to fully engage with universities through the standard pathways.
- University costing models are often considered outrageously expensive by industry. Counter argument: universities need to better argue their economic value. They need to explain that they are not fully funded public institutions (as people may think), and that they have to cover their costs.
- There can be a perception in industry that universities are inflexible and have unrealistic expectations about ownership and licensing rights.
- Is there a necessary tension between what universities and business do? Or, is it better to think of universities as 'market facing' and not 'market led' (**Professor Mark Dodgson, University of Queensland**).
- What can we learn from the sectors that have had high levels of research collaboration – mining and resources and medical research (in Australia), for example? What is the role of government in examining the abilities in those collaborations and looking for application in other sectors?



Dr Lily Chan, CEO, NUS Enterprise, National University of Singapore; Dr Susan Pond AM, Adjunct Professor in Sustainability, University of Sydney; Laura Tingle, Chief Political Editor, The Australian Financial Review; Professor Dame Julia Goodfellow DBE, Vice Chancellor, University of Kent.



Professor Mark Dodgson, Director, Technology and Innovation Management Centre, University of Queensland Business School

- Are we compartmentalising things too much? There is the notion that universities do basic research, then there's an innovation process, and then it goes out to industry. Industry, in fact, has some of the best basic science problems. It does basic research better than our universities do. By the same token, universities do more in the innovation space than corporations tend to think. The key is to view university and industry as a continuum.

University culture and role

There was a huge amount of rethinking of how we have to re-conceptualise the academic role.

- *It is useful to conceive of a four-way partnership between academia, government, industry and society. Academia can play the central role in linking government, industry and society. This is a distinct advantage for universities. They can take a big and broad approach to an issue and look across the piece to take a multidimensional approach.*

Professor Johnny Chan, City University, Hong Kong

- *A university is about creating and using knowledge to make a difference – this is undisputed. What is important is how we use that knowledge to make a difference for the whole of society. It is not always about the commercialisation of ideas and wealth creation but also wealth protection. We need to consider this as knowledge exchange in the broadest sense, and not straight commercialisation.*

Professor Phil Hannaford, University of Aberdeen

- Today's big challenges need multidisciplinary approaches, and this means new ways of working with a multitude of partners; not just governments or the research councils that universities would traditionally work with. It is also NGOs, charities and community groups. That means new ways of thinking and new ways of respecting different people's values, expectations and cultures.
- The expectation should be on *all* academics for public engagement. It is unrealistic to expect all academics to be involved in traditional notions of 'commercialisation' but it can be a requirement to engage publicly in some way.
- There are increasingly different pathways to academic promotion – either by research output, teaching quality or industry engagement. For example, in Taiwan a pilot programme is considering three tracks to academic promotion: research track, applied science track and teaching track.

- Is the time period to change university culture too slow for industry? Especially as competitor countries are developing fast. The academic prestige and reward for publications is still real and it will be hard to change this in the short-term.

The education pipeline and preparing for ‘failure’

Does innovation even lie within universities? Google and Yahoo were founded by Stanford dropouts, Amazon by a Princeton graduate, and Microsoft and Facebook by Harvard undergraduates.

Most of the economic growth in innovation will come from our graduates.

- The importance of the education pipeline in a country’s innovation outcomes cannot be ignored. Innovation is not separate from research, which is not separate from education.
- Is the current, historical, PhD model fit for purpose? Is it flexible enough?
- How are we teaching innovation?

Examples:

The industry-embedded PhD model in **Taiwan**, which is partially driven by industry and partially driven by government. The first year is a Master’s programme, the following two years the PhD course, and during the fourth and fifth years students complete their thesis whilst doing an internship with the company.

The customised education programme with **the University of South Australia** and **Hewlett Packard (HP)**. A four year honours programme where students spend one year of their undergraduate degree working for HP at pay, and then return to finish their studies.

There are similar issues and problems across different parts of the world, but the underlying cultural differences are so intense that issues play out in very different ways across countries.

- What is the cultural appetite for failure? Each system is different and can tolerate different levels.
- How do we train our students for failure? What is culturally acceptable?



Dr Alfred Tan Keng Tiong, Head of Knowledge Transfer Office, Hong Kong Baptist University; Professor Phil Hannaford, Vice-Principal for Research, University of Aberdeen; Dr Phil Extance, Pro Vice Chancellor – Knowledge Transfer and Business Partnership, Aston University

- The level of student debt and economic prospects play directly into their appetite for failure and risk.
- 'Failure' is the wrong term. We need to tell our students that it is a '*learning point*' (**Peter Schutz, Food Innovation Australia Limited**).

Policy

Innovation policy in Australia has been almost exclusively around trying to encourage start-ups and commercialisation. As I look into the rest of the world, I see innovation policy that is balanced with a need to get large research-based corporates into the innovation ecosystem.

- The importance of linking industry policy with policy in other areas such as innovation, education and research but, also, how a change to policy in one area necessarily has a knock-on effect to the other areas.
- A call for national policy setting to be consistent and longer-term. There needs to be a coherent strategy with enough room for latitude, as outcomes can't necessarily be dictated.
- Different types of industry/research/innovation challenges have incredibly different timeframes and financial footprints so you must have a broad range of structures and policy settings to address them.
- The setting and stating of national government priorities in innovation/industry growth areas requires a confidence. While it will always be questioned whether they are the 'best' choices, they are an extraordinarily powerful mechanism.
- The location of major technology companies on the East and West coast of America presents many opportunities for collaboration. This is very different in South East Asia, where there is a lack of major industries locating their R&D. This requires a regional approach (ASEAN) and different ways of working with countries like Australia. For example, the large scale research project via the Australian Auto Cooperative Research Centre (CRC) with Malaysia on battery breakthrough.



Professor Margaret Gardner AO, President and Vice Chancellor of Monash University; Tony Brennan, Deputy British High Commissioner; Kirsten Freeman, Deputy Director British Council Australia; Professor Arthur Chen, Vice President, Kaohsiung Medical University (KMU), Taiwan

Local context, global outcome

University systems are very, very different. The Silicon Valley model works in California but it doesn't work elsewhere in the States. A lot of these models are very much tied to governments and university regulation; but even more crucially, I think, to culture.

- Countries need to manage their own domestic research/industry challenges along with connecting on issues of international interest at the same time.
- There can be a domestic political dialogue about keeping our resources for ourselves and yet we know that if we're competitive—if we join international research funding consortia, like the EU—then we can often gain much more than we lose.
- One of the criteria for establishing a Catapult centre in the UK is that there needs to be a global market to exploit. We need to think about the adaptability of these things to local conditions – they are not easily transported to other contexts.

Play to strengths

There are very few things that most universities are truly world class at. We have to get over this. Universities need to back winners aligned to their strengths.

- This extends to a country or region, also. International industry looks for 'brand X country', not necessarily the individual strengths of X number of universities and research institutes.
- Consider what is truly our national competitive advantage? For Hong Kong, this is being a society that understands how the West works, but also one that acts as a gateway to China. The competitive advantage in Europe is that there is a reasonably effective European Union providing a market on the doorstep of every single country in Europe. What is the competitive advantage for other countries?

Whole of system approach

Have we got our head around what it means to really bring industry and universities together, as opposed to putting in place relatively modest schemes that enable it to happen in particular areas at particular times?



Sophia Chan-Combrink, Head, Education & Society, British Council, Hong Kong; Ainslie Moore, Policy Director International, Universities Australia



Dr Lily Chan, CEO, NUS Enterprise, National University of Singapore

- We talk about industry and research providers as two quite different sectors that need to be brought together by some sort of facilitation scheme, but, in fact, they are part of a continuum.
- We have to start seeing research and the benefits of research as a system-wide issue rather than a set of policies and resources which are particular to the research community itself.
- We need to better explain (1) what innovation is, and (2) what the innovation ecosystem is. This is quite difficult to explain within your own university, let alone to wider stakeholders.
- Collaboration is not only between universities and business, but between universities, too, to complement each other's skills.
- This extends, of course, to collaboration between academics from different disciplines. Knowledge exchange is not the domain of only the sciences, medicine and engineering. We need a much better understanding within universities of how different disciplines work and a respect for this. The big challenges can only be confronted if we have good physics, working alongside good mathematics, alongside good sociology and history, for example.

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Professor Margaret Gardner, Monash University



Dr David Sweeney, Director (Research, Education and Knowledge Exchange), HEFCE; Professor Arun Sharma, Deputy Vice Chancellor (Research and Commercialisation), Queensland University of Technology

- Universities hold a position of unique international convening power.

Examples (from *Vivienne Stern, UK Higher Education International Unit*):

Cardiff University leads the MEDOW project – a €3.9 million Marie Curie Initial Training Network (FP7 funded), bringing together 5 universities and 6 industrial partners to develop technology which will contribute to the formation of a 'super- grid' for sharing renewable power across Europe.

Southampton University, through its Maritime Institute, has driven collaboration between the university and industry in that area that stretches back 20 years. They now have a very large-scale Institute that collaborates with multiple university partners and multiple countries around the world, and it does so in the physical sciences and engineering, and also in humanities and social sciences.

Warwick University leads an academic-industry multinational partnership which has developed the IP to make Remote Laser Welding a practical reality for car manufacture. Commercial IP packages have been developed. Funding is drawn from both the European “Factories of the Future” (FoF) initiative (€3.9M) and the Korean government (€900K), which shortly afterwards initiated a funding programme similar to FoF.

- Some problems are too complex for one country, even one region, to solve. In health and medical research, this is a given. We are no longer in a position to go to one institution to try and solve the problem. Inevitably, we now have to look throughout the world to get a



Professor Roy Green, Dean, UTS Business, University of Technology, Sydney

team of scientists with different skills and infrastructure support to solve the problem. For example, the International Cancer Genomics Consortium of 30 countries.

- Trust, risk and ethics:

Innovation is now so cross-border, we have to find people/countries who we are friends with who we can **trust**. Cultural alignment extends not only to shared understanding but also shared systems for patenting etc. which makes international collaboration much more straightforward.

It can be safer, and **less risky**, to collaborate internationally rather than doing everything yourself.

Ethics are a reason to collaborate internationally as ethics in research should be universal.

- We will see the emergence of research and commercialisation superpowers in the coming decades. To make commercialisation happen, you must have market size. For countries in South East Asia, the imperative is to partner with other countries in the region (and for Australia, as a small country with a high research performance, to similarly look to our neighbours).
- Is it a given that intellectual property arrangements impede international collaboration? Used strategically, can intellectual property systems actually facilitate international interaction? If you have the right structures in place and you protect your position well internationally, you can be an attractive partner from a multinational company's point of view or from an industry partner's point of view.

Companies will go anywhere in the world to identify a unique and strong new technology product or service position. So if you put in place the right systems, you can use it strategically to attract that kind of collaboration.

- There are multiple national government funding schemes that can be used for international collaboration and may not be widely known. For example, funding from the Hong Kong government can be used in other countries, up to half of it if you work with a Hong Kong university. There could be the potential for Australia and the UK to work together in priority countries in South East Asia under schemes like the UK Newton Fund, i.e. Malaysia, Thailand, Vietnam, Philippines and Indonesia.



Dr Nessa Carey, International Director, PraxisUnico