COLLABORATE OR CRUMBLE

HOW AUSTRALIA’S TRIPLE HELIX IS BEING CHALLENGED TO DRIVE AN INNOVATION NATION
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MESSAGE FROM THE EDITOR

In this UIIM issue we take you ‘down under’, the location of the inaugural UIIN Asia-Pacific Conference, to a country going through an ‘innovation boom’. Australian is the home of well-known universities and some global businesses, however has been found to have unexpectedly low rates of university-industry collaboration, being ranked on this metric at the bottom of OECD countries. Through a new National Innovation and Science Agenda launched in 2015, national government is setting a wave of change in motion. With the notion of ‘publish or perish’ morphing into ‘collaborate or crumble’, universities are assuming a larger role in developing innovative businesses and entrepreneurial graduates. In this issue, we present five articles which portray different aspects of this positive change.

In our first article, Melissa Ryan (Innovation Development Senior Manager at iAccelerate) explains how the University of Wollongong has become a key asset of the Illawarra region, which was faced with a decline in the steel and manufacturing industry. A shining example of this contribution is the iAccelerate Entrepreneurship Centre, which has tapped into the entrepreneurial potential of the students and alumni of the University of Wollongong.

Dr. John Howard, an experienced consultant in the Australian triple helix of government, business and universities as well as regional development, shares his vision for university-business engagement in Australia. He highlights the central role of this engagement within innovation systems and the expectations of increased productivity and competitiveness for business. At the same time, he is aware of the lack of knowledge of what the other is doing, which makes the role of intermediaries essential.

Adelaide, hosts one of the most ambitious and innovative initiatives, showcases its Tonsley Innovation Precinct. The vision is to bring together universities, research centres, start-ups, established business and the community to collaborate in different ways within a vibrant, modern residential living and retail space. The Tonsley Precinct Director, Philipp Dautel and the Project Manager Jen Genn describe the rationale, the ideas and the challenges behind this initiative that aims to ‘connect business with the best and the brightest’.

Dr. Elizabeth Eastland has experienced working at a high-level within both university and business in Australia. This provides her with a unique position to described the current trends in the university and business sectors in Australia, identify their main barriers and explain the central role of CSIRO (Australia’s premier research institute) in the innovation ecosystem. Elizabeth foresees a positive future for innovation in Australia due to the higher commitment shown by all stakeholders.

Through a detailed quantitative study, Carolin Plewa and Drew Evans, provide an overview of the current state of university-industry collaboration in South Australia. This analysis shows that ‘there is a clear impetus for change’. This is particularly true in respect to academics, who are motivated not by money but joint publications as well as outputs coming from longer terms relationships more so than one-off transactions.

Aside from the Australian focus, UIIM also brings you the outstanding case of the Siemens Centre for Knowledge Interchange (CKI). Dr. Natasha Eckert (Head of Siemens University Relations) and Dr. Max Riedel (Senior Consultant at Siemens) share with us how nine universities world-wide, considered Siemens strategic partners, host these centres including their creation, long term-vision, careful management and results.

The last article of this issue is a reflection on the role of universities in entrepreneurship education from a centre at the forefront of this topic, The Centre of Transformational Entrepreneurship at Coventry University. The centre’s director, Prof. Gideon Maas, and deputy director, Prof. Paul Jones, reflect on the pressure on entrepreneurial educators to rethink the way they support entrepreneurship education within entrepreneurial eco-systems and debate how it should be transformed in order to address critical challenges in a constructive manner.

We trust that all these stories will inform and inspire you in equal terms and we encourage you to keep innovating, pushing the limits and of course collaborating.

VICTORIA GALAN MUROS
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Starting successfully with the University of Wollongong’s iAccelerate

THE KEY ROLE OF THE UNIVERSITY OF WOLLONGONG IN THE REDEVELOPMENT OF THE ILLAWARRA REGION

In the face of regional decline, universities have increasingly proven to be key assets in the transition of the local economy. The Universities of Waterloo, Twente, and Teesside provide shining examples of this potential. In the coming years we could add to the list the iAccelerate entrepreneurship centre, which is taking a prominent role in the redevelopment of the Illawarra region in the face of a decline in the steel and manufacturing industry.
Originally instigated as the ‘iAccelerate initiative’ by the University of Wollongong (UOW) in 2011, the iAccelerate Centre, which opened in July 2016, is a crucial step towards galvanising Illawarra as an “innovative region”. The iAccelerate Centre now represents the new face and direction of the regional economy, one of innovation, growth and self-determinacy.

The target for the initiative was to tap into the latent potential identified in the ICT graduates (UOW has the highest rates of ICT graduates in Australia), UOW alumni, those SMEs that had been servicing the steel industry combined with a business community that was committed to developing a tech sector.

Starting as a 20 seat co-location space, iAccelerate has itself followed an entrepreneurial development path. Much like a start-up, throughout the initial phase of its existence, the centre followed a lean development approach as concepts were tested and iterated to find the mix of activities fitting to the region and the needs of the market.

Covering the different phases of the start-up lifecycle, iAccelerate offers a location and equipment for starters as well as a rigorous development programme, including education programmes, pitching training, intensive mentorships, connection to finance, networking events and peer-to-peer engagement.

Fast forward to today, and the centre itself has become an essential cog within which all elements of the iAccelerate programme are brought together in a “hothouse environment”. However, its development was reliant on a few essential factors, which provide an exemplar case of how to get a regionally-embedded entrepreneurship centre off the ground.

Through the initial leadership of Elisabeth Eastmann, together with a progressive senior university management, the entrepreneurship initiative commenced with full support of the university. This conviction added to a commitment to engage the opinion of regional stakeholders has helped to develop and sustain enthusiasm and momentum for iAccelerate, a vital ingredient in developing any new entrepreneurship initiative. A focussed and professional approach to access government and internal university funding for iAccelerate’s growth allowed management to convert this local support into finance, which was then used to employ key staff and ultimately, the impressive building in which iAccelerate now operates.

Clear objectives of how the centre should contribute to the university as well as the surrounding community provided the necessary vision for its development path. Critically, the focus for the centre was on retaining talent in the Illawarra region by providing a platform for graduate and alumni entrepreneurship as well as the development of jobs within the region to the tune of 500 new jobs and $AU75m (approx. €50m) in inward investment within 5 years. This differs to many entrepreneurship initiatives, which often seek to develop fast growth new enterprise with a medium-term exit point or which provide an opportunity for licensing; however, do not necessarily contribute long term employment opportunities or a platform for regional development.
Contributing to not only the vision of iAccelerate but also the method for its development was the successful Canadian example of the Waterloo region, whereby the University of Waterloo provided a nexus for the transformation of its region into Canada’s version of Silicon Valley. Close cooperation with members of the leaders of the initiative helped to guide iAccelerate’s early development, which included visits of iAccelerate management to Waterloo as well as reciprocal visits from Waterloo personal to Wollongong.

A further factor for their success was their engagement of the regional stakeholders through a number of mechanisms. The first and most prominent is the eClub, a regionally-focused entrepreneurship networking event whereby they hand-picked representatives from government, business and academia. An additional initiative was the iAccelerate’s Women’s Entrepreneurial Breakfast series, which was launched in 2014. Since its inception, it has attracted and maintained significant female interest by being suited to female interests. For this reason, it is held in the morning instead of evening, provides ample time for networking and provides accessible models and learnings for potential female entrepreneurs.

The results thus far have been impressive. iAccelerate has experienced the following success since its inauguration in 2011:

- Companies assisted: 75 in total, including 39 companies currently in residence
- Start-up Jobs: 143
- Household income: $24.1M, including $15.5M in direct compensation of employees, and a further $8.6M (via indirect and induced effects) sustained elsewhere in the economy;
- Value added: $34.8M, including $18.2M in direct value added, and $13.1M (via indirect and induced effects) elsewhere in the economy;
- Female entrepreneurship: 47% iAccelerate start-ups with a female co-founder 391 full time equivalent jobs, including 256 direct jobs, and a further 135 (via indirect and induced effects) sustained elsewhere in the economy;

Despite its youth, the iAccelerate initiative provides some clear lessons for those trying to get such an initiative off the ground. The ongoing challenge for iAccelerate will be to continue to build enthusiasm and stay relevant for its university and region, but the foundation for success is firmly in place.

Melissa Ryan | Innovation Development Senior Manager at iAccelerate - University of Wollongong
Melissa is responsible for developing and implementing business and marketing strategy to enhance UOW’s traction within the commercial marketplace via research, technology transfer and key initiatives such as iAccelerate. Melissa has a strong corporate background in marketing and communication strategy, relationship building and business development.

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A vision for University-Business Engagement in Australia

Cooperation and collaboration between universities, business, government and the community is a major plank in contemporary innovation systems thinking. There is an expectation that stronger interactions and relationships will lead to improved productivity, performance and competitiveness at the firm, regional and national levels. There is often a presumption that if potential connection points are identified, knowledge will flow through some process of transfer and translation. Governments have established programmes to facilitate these flows, although their effectiveness is rarely evaluated.

There is a vast difference between the way innovation systems are described in terms of knowledge flows, and the way they operate in formal and even semi-formal ways. The working of innovation systems relies to a large degree on initial personal contacts and networks and their subsequent formalisation through a hierarchy of understandings and agreements – starting from informal assistance and advice, transactional contracts for commissioned research and consultancy, through to more formalised memoranda of understanding, affiliation agreements and partnerships, and finally, to binding joint ventures and incorporated entities. This movement from transactions to partnerships requires the development and application of skills and systems for relationship management and capacity for the negotiation and execution of sustainable longer term partnerships that involve senior executive level input from all parties. This input not only addresses issues relating to teaching and research outcomes, but also matters concerning commitment, cost and risk. The development of these relationships must also occur in an increasingly complex university-business model.

The Cooperative Research Centres (CRC) Programme, established in 1992, and ARC Linkage Scheme are held up as exemplars, but like most other mechanisms aimed at enhancing the transfer and translation of research for economic benefit (Howard, 2015), the funding levels are hardly sufficient to have far reaching economic impact. In an environment of tough fiscal restraint policymakers look to universities to raise funds from students and industry to finance these ‘third mission’ activities. Financially, Australian universities have done well out of international education and the demand driven student funding system over the last five years.

Institutionally, universities in Australia are independent and autonomous public organisations established by State/Territory Governments. They are not charities or an arm of government. Apart from conditional funding, there is a limited range of public policy instruments to influence university decision making and resource allocation. It is well acknowledged, of course, that universities respond well to financial incentives.

The changing university-business model

Universities are regarded in manifold ways the provider of common benefits and the ‘doer of social good’. Universally accessible and affordable public higher education systems have become an economic and social necessity for advanced nations, states and communities. However, Australian policy makers have not until quite recently shown much systematic interest in providing the adequate funding to secure these benefits. The foreshadowed Innovation Science Australia (ISA) National Innovation System Strategic Plan to 2030 provides an opportunity to address this issue.

There is no one single model of a university. They work within their statutes with strategies, structures, processes and systems to achieve mission, goals and objectives determined by governing boards (councils/senates). Universities have substantial regional and local impact, and can be leaders in regional innovation ecosystems. They are also substantial property developers and have an impact in the urban and regional development landscape. They can provide (and have provided) leadership in urban planning and renewal. Some have also developed integrated ‘system’ strategies covering higher education, vocational

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* There are many economic studies prepared by consultants that point to ‘big numbers’ of economic impact. These models are seriously flawed as to methodology and underlying assumptions. See The Use and Abuse of Economic Modelling in Australia: User’s Guide to Tricks of the Trade (Dennis, 2012)
and school education – often without the policy support – to meet industry demand for skills.

Australian universities are major players in the global higher education industry, and within this industry setting they are both collaborators and competitors. They collaborate in accessing research funds from international organisations, including the EU Horizon 2020 Programmes. However, they compete vigorously for students, faculty, research grants, revenue, rankings, prestige, and senior executives. In this respect, they behave like any other global business.

Universities are also substantial businesses, run on a commercial (business-like) basis. In 2015, total revenues for all Australian public universities amounted to $28.6 billion (the largest, University of Melbourne, had revenues of $2.1 billion). Total sector net assets amounted to $50.3 billion. They generated a positive cash flow on operations of $3.5 billion, and paid $3.2 billion for property, plant and equipment. Receipts from students and ‘other customers’ amounted to $10.6 billion. Increasing size creates increasingly complex organisations, demanding greater professional specialisation. Related commercially oriented businesses are also emerging.

The competitive environment, together with the business orientation, may cut across the objectives of delivering national (and state and local) economic and social benefits. This includes encouraging (inducing) students into a university environment where other education options, including a VET based qualification would be more appropriate. Moreover, the university and VET systems operate in separate policy, jurisdictional and funding contexts. This is despite employers indicating that they require a mix of academic and occupational learning.

There is a widespread view in Australia that university-industry research collaboration is not working well. University research focus and performance is not considered to be matching, or responding, to industry requirements. This view centres on a perceived ‘failure’ of knowledge transfer – an inability on the part of industry (and government) to tap into and exploit for industrial and economic purposes the knowledge that is generated through research. Universities, and particularly academics, are portrayed as being unresponsive to business and industry needs, and businesses are criticised for not being able to articulate their needs. University administrative processes and procedures are also major barriers.

The contemporary observations about ‘the failure of knowledge transfer’ echo those made 15-20 years ago. Much of the ‘failure’ is attributed to differences in cultures and motivations between universities and businesses, as well as behavioural and attitudinal issues among academic staff. Public policy action is advocated to change cultures, attitudes, and incentives in this domain. But the ‘failure’ may reflect a deeper innovation system failure that can be traced to a transactional approach and understanding of university-business relationships and basis of knowledge transfer. That approach reflects a commodity view of the nature of knowledge built around the idea of merchandising of knowledge products captured in Intellectual Property Rights (IPRs).

But of course, IPRs have absolutely no value unless they are used. Moreover, and apart from a few ‘blockbuster’ patents, universities make very little money out of sale and/or licensing of IPRs. Most university technology transfer offices in Australia lose money. However, for many universities, an IPR provides a seat at the table in a longer term, sustained university-industry collaborations and partnerships built around strategies that address the goals and objectives of each party. In the business community, there is a widespread appreciation that market oriented transactions are underpinned by high levels of trust and strong relationships. People do business with people they trust. The same consideration applies to working with universities.

The future of university-business interactions is heavily contingent on building stronger trust based relationships through a step change increase in the capacity and capability for engagement as a foundation for interactions and relationships. Engagement shifts the relationship from one based on buying and selling to one based on a joint and genuinely collaborative approach to capturing business and further research opportunities presented by knowledge breakthroughs.

Building capacity for engagement
Relationships between organisations work best when trust and confidence is established at the governance (Board, Council) and executive (CEO, Vice-Chancellor) level. They do not work well when the approach is built around transactions with researchers looking for money to fund their already established research projects and interests. Whilst universities are oriented towards what Ernest Boyer referred to as a scholarship of discovery, businesses are much more oriented towards a scholarship of application and implementation. These forms of scholarship are not independent but are integrated into a scholarship of engagement. Building the capability for engagement is a critical challenge for effective university-business interactions (Boyer, 1995, 1997).

In general terms, business people do not know much about universities or how to work with them—withstanding
that many business people are university graduates and hold post graduate qualifications. Similarly, in Australian universities, very few chancellery executives, faculty deans, and directors of research centres or institutes have had business experience, particularly in a line management or operational role. It follows that the task of building sustainable university-business engagement is not a trivial undertaking. It is not only a question of what to do, but also how to do it effectively.

The task of university engagement management therefore is to open conversations with business and establish an intermediary and translational role between the research, professional development and extension capabilities within a university and the strategic and innovation management roles and responsibilities within a business (or NGO) organisation. Arguably, this role is performed more effectively within university management structures than by independent third parties or agents. Recent experiments in Australia using third party intermediaries have not lived up to expectations (Howard, 2007).

These factors point to a requirement to build capacity to create longer term trust based relationships between university staff and senior managers in business. Such an approach cannot be mandated by structures: it requires agility, flexibility and acceptance of some uncertainty in relation to outcomes. This is the cornerstone of effective engagement management. Universities have been using a variety of engagement instruments, including adjunct appointment policies, to build business relationships. Senior university staff also participate actively in business forums and regional development councils.

Effective engagement is much less about structures, and more about systems and people wanting to ensure that relationships are developed, managed and sustained. But in a tight economic climate, this activity must be funded, and value must be seen to be created and delivered for all parties. Government ‘seed’ funding can be important in this respect, but it is not the role of government to dictate terms of engagement through programme funding frameworks, guidelines and conditions. Government should be there as an intermediary—not just as a resource provider (although the resources are nice to have).

Building and sustaining business-university relationships requires a specialised skill and capability with intermediaries and brokers having knowledge of missions and values of both sets of institutions. In recent years, universities have made appointments at a senior executive level for people to build engagement with industry. These roles extend beyond technology transfer and searching for research income and well into building confidence with a university about the importance of strong long-term relationships. Appointees to positions of DVC Research and Innovation are expected to be able to build trust with potential industry partners.

Successful businesses have created effective customer relationship management (CRM) systems to build greater understanding about their customer and client bases. The technology exists for universities to know much more about their ‘customers’ – the people and organisations who currently and potentially demand their knowledge and the knowledge services that can be derived from it. Building this capacity for relationships and engagement requires development of a strong service culture with supporting investments in people and technology.

The path to better engagement also means working with business and business organisations to create awareness of how universities operate, and build confidence about the prospects of working with a university as an organisation, rather than individual academics. This means engaging directly with university Councils and Vice-Chancellors on a business-to-business basis. Moreover, universities require strong guidance on what government (at all levels), industry and the community wants the national tertiary education system to deliver in terms of economic, industry and social outcomes in an economy built on the generation and application of knowledge.

Dr. John H. Howards | Adjunct Professor UTS Business School | Adjunct professor and Academic Fellow University of Canberra | Managing Director Howard Partners Pty Ltd.

John Howard is a highly regarded senior executive with knowledge, skills and experience in management strategy, public policy, strategic communication, community engagement, local government and regional development. He has successfully operated a specialist management consulting and policy advisory firm over an 18-year period and hold senior executive roles in government, universities, and global professional services firms. John develops and implements corporate communication and engagement strategies; advises Ministers and public agencies providing evidence based advice; including the topic of engagement between higher education, industry and government, and the transfer and translation of knowledge for economic, social, and community benefit.

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www.university-industry.com
The vision for Tonsley’s Innovation Precinct is to be a place that creates high value jobs by collocating world class research and education institutions and a related variety of innovative businesses alongside vibrant, modern residential living and retail space.
The origins of Tonsley Innovation Precint

When Mitsubishi ceased production in Adelaide in 2008, there was a clear imperative for the South Australian Government to do something innovative and internationally significant at a site described as a ‘once in a lifetime’ land development opportunity.

There was also a realisation that any redevelopment could not be a traditional science or office park. In an era where connectedness is paramount to drive innovation and entrepreneurship, the siloed science park seems outdated. A visionary approach was required to address the major impact Mitsubishi’s closure would have on Southern Adelaide’s economy.

There was a need for the response to Mitsubishi’s closure to be transformative; to help industry, particularly manufacturing, change and move to higher value products. Manufacturing is considered an essential element in a resilient and prosperous South Australian economy. This need of renewal and growth was the origin of Tonsley Innovation Precint.

Tonsley’s design and early development

What was initially described as developing Tonsley’s soft as well as hard infrastructure, incorporates bringing research and industry together; encouraging business-to-business collaboration; clustering activity from businesses with a shared industry focus in fields where South Australia has a comparative advantage; and creating an environment that supports entrepreneurial activity and a culture of innovation. This is why Tonsley has been designed as a mixed-use precinct that incorporates high density residential, retail, education, commercial and industrial land uses.

The model for achieving this vision has been based around a triple helix partnership between government, university and industry. This model incorporates the development of high amenity, mixed use urban development (physical assets), populated with anchor businesses as well as research and training institutions (economic assets) in an environment that supports entrepreneurial activity and a culture of innovation (networking assets) to create an innovation district.

Since the implementation in March 2012 of a 20-year redevelopment project, it is evident that the triple helix partnership is established and the vision for Tonsley is being delivered both from an urban renewal and economic development point of view.

With Flinders University, a tertiary education and research institution, and TAFE SA, a vocational skills training institution, both established on site, there are numerous opportunities of collaboration with industry, some of which are already evident through companies such as Zen Energy.

Leading and innovative business have invested and are operating on site, including companies such as Siemens, Somark, Signostics, Micro-X, and more. In addition to that, Tonsley’s co-working spaces and associated business incubation and acceleration programmes all contribute to creating an entrepreneurial environment and culture of innovation.

High quality, mixed use, urban redevelopment is well progressed with the centrepiece of Tonsley, the Main Assembly Building’s large roof structure refurbished, retail outlets operating, a residential development partnership confirmed and trunk infrastructure in place.

Tonsley’s design excellence has been acknowledged with a series of development industry awards, including international acclaim, winning the 2015 World Architecture News Award for Adaptive Reuse. Furthermore, Tonsley has been awarded a Six-Star Green Star – Communities accreditation by the Green Building Council of Australia and represents the highest level of leadership and innovation in high quality, sustainable urban renewal.
Tonsley’s vision as economic growth engine

Over the coming years, Tonsley intends to become firmly established as an economic growth engine for South Australia as the precinct reaches a critical mass of industry, research, education and commercial activity collocated on the site.

The residential population on site will expand towards the ultimate target of 1,200 people to create a vibrant community that supports innovation and entrepreneurship. Also, a smart grid energy system will be established that incorporates onsite renewable energy generation, storage, distribution management and supply to site occupants.

Ultimately, the Government of South Australia intends to divest ownership of all property assets at Tonsley. At the completion of the project delivery phase, the intention is to leave behind a self-sustaining precinct governance model that will have ongoing responsibility for maintaining Tonsley’s culture of innovation, collaboration and entrepreneurial activity.

The challenge of dealing with uncertainty

It has always been acknowledged that the vision for Tonsley would face fundamental challenges as the traditional manufacturing sector experiences unprecedented uncertainty and decline across Australia. South Australia’s economic challenges that led to the initiation of the Tonsley project in the first instance have significantly compounded in the short time since the project was approved just under 5 years ago. Therefore, South Australia is yet to see the full impact of the local General Motors Holden closure and the national withdrawal of the automotive manufacturing industry on the South Australian economy. Similarly, the wave of investment from the expected resources boom did not materialise in South Australia. Thus, while the need for proactive, visionary initiatives like Tonsley has never been greater, the economic environment that the Tonsley Innovation Precinct is operating in has rarely been more challenging.

Philipp Dautel | Precinct Director Tonsley Innovation
Philipp Dautel is responsible for the delivery of the Tonsley Innovation Precinct vision, including facilitating collaboration between research institutions and industry to promote innovation and commercialisation opportunities. He also leads business development and investment attraction in the precinct through engaging with industry and communities (locally, nationally and internationally) and enhancing commercial opportunities.

Before joining the Tonsley team, Philipp was facilitating a Federal Government Programme in South Australia where he helped companies engage with research organisations to drive innovation and business growth for SMEs. He also worked at UniSA’s technology commercialisation company, UniSA Ventures, which included assessing and developing commercial opportunities.


Jed Gunn | Project Manager Tonsley Redevelopment Project
Jed Gunn is managing the development and implementation of major elements of the Tonsley Redevelopment Project’s economic development and investment attraction strategy, including Tonsley’s Economic Development Plan, Investment Attraction and Business Development Model and Benchmarking Framework.

Prior to his work on the Tonsley project, Jed had extensive experience in the delivery of major urban renewal projects for the South Australia Housing Trust and with Adelaide City Council’s residential growth program.

Jed is a qualified Quantity Surveyor who has worked in construction and project delivery roles in the private and public sector over the last 20 years.

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Interview with Dr. Elizabeth Eastland, CSIRO

INTERVIEWED BY DR. VICTORIA GALAN-MUROS

From her current position in CSIRO, Dr. Eastland shares with the UIIM reader her view of the Australian university-business engagement and innovation

Which are the current trends in the university and business sectors in Australia?
In the last one or two decades, universities in Australia have become one of our most prominent services industries and one of largest export industries due to both research and education excellence. A lot of international students come to learn from our universities, and we are very strong and well-known for our research internationally, and well-positioned in research rankings.

However, Australian industry has not always fully benefitted from the research and technology from our universities. Over the last 20 years, Australia has benefited from a great minerals and resources boom instead, which has fuelled the economy despite the global financial crisis. Now, as the resources boom diminishes, the government and the society need to look other industries and home-grown industries that can contribute a higher percentage to the economy.

The fact that Australia has one of the lowest research-industry engagement rates in the OECD countries is actually a real problem. Therefore, the current and previous governments have been increasingly encouraging universities and CSIRO to be more proactively engaged with industry. There are numerous business research grant schemes at the state and federal levels that require this engagement, and more recently, the Innovation and Science Agenda makes a much stronger push. This government sees that new industries will come from research and innovation, which is getting back to Porter’s theory of clusters of innovation and economic growth.

What is the role of CSIRO in the Australian innovation ecosystem?
CSIRO has been around for a hundred years in order to direct national science efforts towards increasing Australia’s productivity and helping Australia prosper. That prosperity can be both to direct industry gains but also gains for public good, such as water systems, food security or good infrastructure. We are a national footprint and we are both a partner for industry and for universities, acting as an innovation catalyst. With 56 locations, we sponsor over a thousand PhD students a year, we co-supervise them with our university partners, and we have a large amount of patents.

CSIRO is taking a more external view and has launched several programmes to do that. One of them is ON, a 16-week acceleration programme to accelerate innovative ideas from research into the market place, whether that is commercialised through licensing, assignment or spinning a company out. It is based on the lean start-up principle, the customer discovery, and the business model exploration. It has been funded both internally from CSIRO but also from the National Innovation and Science Agenda. We launched the programme a year ago internally within CSIRO to test it and due to the successful results, last year we invited all universities to participate which they gain access to free of charge. We have twenty-two universities, and one publicly funded research agency engaged so far.

That is one of the four main initiatives that CSIRO takes to better catalyse the research-business relationships and to start new industries in Australia. Other programmes are related to improving the cooperation with universities and with businesses, and a global initiative that includes the opening of a new US office in Silicon Valley to deeply engage with the innovation ecosystem there.

Which are the main barriers that universities and industry face for their collaboration?
I do not think it is unique to Australia, but I think that industry might expect universities to run more like a business, where there is a clear entry point. You could call a number and ask somebody and you’ll get somewhere, but research organisations, by virtue of their porous nature, are generally poor at this. They have many interfaces with the external world, many different kind of relationships with business. For example there are students who go to work for businesses, businesses that fund research, staff who jointly lecture at universities but also have a permanent position in industry, etc. Because universities by their nature are exploring so many different things and individual researchers are
essentially autonomous in their exploration of their own research field, each academic might have a different relation with national or international industry partners aligned with their research interests. I think it’s often very hard for industry to know where to go within a university to get an answer to a question so it is bewildering for a company and particularly for a small business.

In Australia, apart from a few big players in certain sectors, we are dominated by small and medium-sized businesses. Most of the employment grows within small businesses, but they are a very cash strapped to grow, and time-poor, and don’t know how to easily engage with universities. I think both universities and CSIRO need to reach out a lot more and make it easy for the business sectors to know how to engage.

Also, universities are often accused of over-valuing their intellectual property. Very often the university research is at early stages, far from being ready to be massed produced on the market, and thus involving high risk and effort to take to the market. However, because research is generally oriented to solving national problems, and tends to be more applied than universities.

Universities in Australia also have a key role for regional innovation, like the case of the University of Wollongong, in which development you were highly involved. What would you highlight of that contribution?

I think regional universities can and do have a huge economic value to add to their local region. In the case of the University of Wollongong, in founding and launching iAccelerate, I felt very strongly that it was an obligation to contribute to the local industrial sector. The university was actually established to assist the regional steel industry, so it grew out of metallurgy culture to help by graduating great metallurgy engineers. Because of these roots, the university increased its pure research capabilities in environmental sciences, geographical sciences, geo-mapping, etc. and became a world class research university. In the last couple of decades, the local steel industry was suffering and unemployment became an issue.

I felt that we lived in a community, one that needed help, and our students were graduating with superb degrees but had to go elsewhere to find jobs. I felt that we owed our students the capabilities to start their own businesses; as well, the Illawarra is populated with SMEs that have excellent technology capabilities, but that were supplying a dying steel industry. That is the origin of iAccelerate, which gave the region the framework to launch new ideas effectively, and we made very clear that their company had to be committed to grow in the region, and to contribute to it. This caused some alumni to come back into the region to start their own companies. iAccelerate provided them with the lean start-up principles, and everything that a small and early-stage company would need to know to set up: legal, governance, intellectual property protection, marketing, business model analysis, commercialization capabilities, etc.

Finally, how do you see the future of innovation and university-industry engagement in Australia?

I see the landscape changing very positively and I think it’s going in the right direction. It is terribly exciting to see how innovators and researchers are now thinking. I think that all universities are recognizing that students will graduate into an entirely different ecosystem than their parents did, and that the average life-time of a company on a stock market has been reduced significantly over the last number of years. Therefore, universities will have to arm their students with the capabilities to be entrepreneurs themselves and be prepared for a different world. Currently, many universities are introducing entrepreneurship and business courses and I think that they are also encouraging the staff, by virtue of starting their commercialization procedures in an easier way. Also, there’s a current discussion among vice-chancellors in which they are showing a real commitment to contribute not only to education and pure research, but to the innovative capacity of education and applied research in Australia.
Academics do want to engage with business, but need more support

Universities today are under more pressure than ever to collaborate with industry. In the words of Prime Minister Malcolm Turnbull: “Increasing collaboration between businesses, universities and the research sector is absolutely critical for our businesses to remain competitive.” Australia has a poor report card when it comes to university-business collaboration. It ranks last among the OECD countries when comparing the proportion of businesses working with universities. But this is not all. Australia ranks only 72nd in the world on the Innovation Efficiency Ratio, a measure comparing innovation inputs to outputs. And we have one of the lowest number of scientific publications co-authored by industry in the OECD. There is a clear impetus for change. A change towards more academic collaboration with industry.

Why are there such low levels of collaboration?
A popular belief is that researchers are focused on publishing their work in academic journals, and not interested in collaboration with industry. At a press conference on science and innovation, Turnbull said:

… the primary motivator has been to publish and make sure your publications are cited in lots of other publications, hence the term “publish or perish”.

Publications are, and will continue to be, critical for the advancement of knowledge and for the reputation of academics and universities alike. But does that mean academics aren’t interested in working with business?

Recently the South Australian Science Council undertook a benchmarking survey to test this assumption.

The academic engagement with end users survey was designed to capture the perceptions and attitudes of academics when it comes to engaging with business, government or non-profit organisations.

The survey (which has not been published publicly due to confidentiality reasons) sampled 20% of the total academic employees across three universities in South Australia. The sample size of 852 academics is large enough to tell us something about the Australian, not just South Australian, academic.

The findings found that the most academics (nine out of ten) were motivated to engage with business to help translate their research into practice. And 86% were motivated to engage in order to have an impact on society.

Academics not motivated by money
It is not money that makes a difference. Only 25% indicated that the opportunity to increase their personal income motivated them to engage.

We often think that there are just too many barriers to engagement. These barriers range from difficulty in agreeing on Intellectual Property (IP), to mismatches in culture, to a lack of personal contacts with industry, and so on.

But are these barriers really inhibiting engagement?

Few academics in the survey agreed. Only 15% of respondents agreed that their research was too far removed from the end users. 16% agreed that end user engagement doesn’t help achieve their career goals.

Just under one third of respondents agreed that engaging with end users is difficult, that they don’t have relevant skills, or personal contacts or that it would detract them from undertaking other research.

Building stronger relationship between academics and industry
A simple focus on financial incentives alone won’t make a difference.
In the eyes of the academics responding to the survey, they need: Time, support and an environment encouraging of engagement.

**Time** to dedicate to the networking and relationship building that will lead to successful collaboration. It is relationships, not just single transactions, that breed success. These relationships are integral to research and teaching; integral to the university’s role in society. Yet building relationships takes time.

**Support mechanisms** are significant enablers. While important for all, they are crucial for newcomers. 80% of the respondents who had not previously engaged with business desire it.

The support comprises staff dedicated to assist in finding end-users, help define applications, facilitate networking and conduct project management. By supporting academics behind the scenes, they enable them to focus on what they are good at - working with their business partners on achieving the desired outcomes.

**An environment** perceived as encouraging engagement stimulates further engagement. The survey shows that only 29% of respondents who have not worked with business view their local research group as encouraging engagement, compared to 77% of those who have engaged extensively. An encouraging team atmosphere, support from peers and support networks can all help facilitate an engagement friendly culture.

The research suggests that we need to shift our thinking on this topic, away from extrinsic motivators such as money, and towards a focus on what intrinsically motivates academics to engage, such as impact.

**The conversation** must move away from “overcoming barriers”, which in the eyes of most academics don’t actually exist. We are wasting time dreaming up solutions to problems that don’t exist.

‘**It takes three to tango**’

Not every academic will engage closely with industry, nor do we want every academic to engage. We need to establish the ecosystem in which engagement is easy and rewarding.

As former Chief Scientist Ian Chubb recently put it: “It takes three to tango”.

Not all academics will want to tango with business; tango is close, intense and full of twists and turns. Yet many want to line dance, foxtrot, or quickstep. They want to engage in different ways.

The Australian government needs to consider the policy framework that enables academics to engage in a way that is best for them and their partners through the provision of time, support, encouragement and recognition.

This article was originally published in ‘The conversation’.

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**The Conversation**

Carolin Plewa | Associate Professor in Marketing Adelaide University
A/Prof Carolin Plewa is Deputy Director of the ECIC, Associate Professor in Marketing and a research member of IPAS at The University of Adelaide. She specialises in the interaction and value co-creation across a myriad of organisations and individuals, with a particular emphasis on university-business collaboration, as well as service and social contexts. Her research on university-business engagement, in particular, has led to her appointment to the South Australian Science Council in 2015 and to the scientific board of the UIIN. Carolin has received a number of competitive research grants and has published her research in highly regarded international journals.

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Drew Evans | Associate Professor of Energy and Advanced Manufacturing, University of South Australia
A/Prof Drew Evans is a research leader in advanced manufacturing within the Future Industries Institute. He has over a decade’s worth of experience working at the interface between universities and business. His team adds value to manufacturing businesses by undertaking fundamental and translational research of the materials/processes behind new product commercialisation. Drew was appointed to the South Australian Premier’s Research and Industry Council in 2014 which evolved into the South Australian Science Council in 2015, and in 2016 became an executive member of the EMCR Forum under the Australian Academy of Science.

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Siemens has established Centres for Knowledge Interchange (CKI) at nine universities worldwide. High management attention and a team of key-account managers are the key ingredients to foster collaboration.

Founded in 1847 by Werner von Siemens as a start-up for communication technology, Siemens is today Europe’s largest industrial conglomerate and one of the world’s leading supplier of systems for power generation and transmission as well as industrial automation, infrastructure and medical diagnosis.

In times when digitalization is a major driver for all businesses, it is important to cope with short innovation cycles and foresee potentially disruptive technologies. Open innovation, including collaboration with universities (UIC) and start-ups, is one of the key success factors to stay ahead of the competition.

To foster UIC, Siemens has a unique approach. “We have installed so-called Centres for Knowledge Interchange (CKI) at those universities with highest relevance to Siemens. The CKIs serve as a single point-of-contact for all research and recruiting related activities and ensure a continuous dialogue on the management level” explains Dr. Natascha Eckert, head of Siemens’ University Relations department, which is part of Siemens Corporate Technology. In 2001, TU Munich was nominated the first CKI university; today, the network includes nine internationally leading universities (see figure) with a focus in central Europe.

Five people play key roles in the relation: Each CKI university has a so called Management Sponsor at Siemens and a counterpart on the university side, the so-called CKI director. They meet regularly to review the relation status and discuss measures to improve it further. Since the Management Sponsor is usually a Siemens board member or country CEO and the CKI is a dean or vice-president, chances are high that concrete action follows these meetings. They are supported by a team at a ‘operational level’: the so-called CKI Manager is the university’s key account manager for Siemens. His counterparts on the company side are a university relation Manager R&D from Dr. Eckert’s team and a university relation Manager HR from either the Talent Acquisition or Employer Branding department.

In words of Dr. Stefan März, CKI Manager at TU Munich: “We work closely together as a team. Essentially, it is our job to build a bridge between the two organizations to make it easier for our researchers and students to ‘commute’. It
Book on Success Factors for Strategic Industry-University Collaboration

Are you interested to learn more about the CKI programme and other strategic UIC programmes of global corporations, such as BMW, Dupont or IBM? Would you like to know how these programmes have been established, what their key ingredients are, and what advice their responsible managers have to share?

Then stay tuned for “Success Factors for Strategic Industry-University Collaboration”, the first in-depth book about UIC from an industry point of view, that the authors are currently editing together with Lars Frolund (Development Manager Corporate Relations and Technology Transfer at University of Aarhus and Visiting Innovation Scholar at MIT). The book is planned to be published in fall 2017 by Elsevier. More details will come in the next issues of UIIM.
starts by knowing about all joint activities, and being able to refer requests to the right responsible. We consult on the best collaboration format and partner, establish contacts and organize lab visits or technology workshops on request. In short, whatever a Siemens or TUM employee needs from the other side, we are here to help. But we also pro-actively organize several events in order to bring people together. Our “Sommergespräch” (summer talk) has already a 30-year tradition and we have organized our first CKI conference on the topic of autonomous systems last year. We run a Siemens mentoring programme for excellent TUM students or regularly host brunches where students can get to know Siemens employees in an informal atmosphere.”

Some universities, especially in the USA, offer such services in a dedicated industry liaison office. When their offer suits Siemens’ needs, these offices are used to host the CKI, as is the case for example at UC Berkeley. However, many universities still do not offer a professional liaison organization as standard and the CKI is a way to create a “custom built” liaison programme for Siemens.

But why is Siemens putting resources into the CKI programme? What’s the benefit for Dr. Eckert’s organisation? “Our goal is to focus our university collaboration on a few, strategic partners. The advantages are obvious. First, Master Research Agreements, which are a standard component of the CKI partnership, allow for easy and fast project setup without long legal negotiations. But these Master Research Agreements only make sense for strong partners with high collaboration volume. Second, we need large, long-term, strategic research cooperation to be truly innovative. But this kind of projects is only initiated with trusted partners and needs a high degree of management commitment. Third, today, Siemens is one of Europe’s largest software companies. You might be surprised to hear that and many students are as well. When we want to compete with Google or IBM for the best talents, we need to focus our efforts.”

Even when in the last 15 years, Siemens has gone through a lot of changes, the CKI programme continues to grow. What are some lessons learnt by Dr. Eckert? “Two things maybe: First, for such a programme to become effective, you’re in it for the long run. So be very careful in the selection of your partner universities and also the management sponsors. The university needs to have a proven track-record of good relation and many cooperations with Siemens and we require a solid outlook at least for the next three years. The management sponsor is appointed ‘for life’, so he needs to have an intrinsic motivation to be the face of the company towards the university. And second, UIC is a people’s business. There is no use in prohibiting collaboration with a non-CKI-university, it will only frustrate researchers. You should do everything you can to bring people together and let them discuss their work. Then they will find common interests and eventually start working together.”
The most important roles in a Center for Knowledge Interchange (CKI)

Executive level

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<td>CKI director</td>
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<td>UR manager (R&amp;D + HR)</td>
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Working level

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<td>CKI manager</td>
<td>UR manager (R&amp;D + HR)</td>
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Close alignment
Regular contact

Dr. Natascha Eckert | Head of Siemens University Relations
Natascha is active in various leading roles within Corporate Research for over 10 years. Currently she heads Siemens University Relations and is responsible for the global strategic partner programs with universities and research institutes. After two years with OSRAM Corporate Technology, she re-joined Siemens in February 2015 where she had already overseen Siemens partner management with universities and research institutes for over four years. Natascha has a long-year experience in Siemens’ international technology and innovation management and was responsible for Corporate Technology’s expansion to China, India and Russia. During two years, she worked with Prof. Requardt and built up the CTO function within Siemens.

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Dr. Max Fabian Riedel | Senior consultant Siemens Corporate Technology University Relations
Dr. Max Riedel is a senior consultant at Siemens Corporate Technology University Relations in Munich, Germany. His daily tasks include consulting Siemens businesses in all aspects of university cooperation, ranging from developing a partnering strategy over finding suitable research partners to fostering long-term strategic cooperation. He is also key account manager for two of Siemens’ Strategic Partner Universities, TU Munich and KIT. Currently, he is co-editing a book on success-factors for university-industry cooperation, which is scheduled for publishing in 2017.

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Reflecting on the role of Universities in Entrepreneurship Education

Since the 80’s entrepreneurship education has grown in importance within Higher Education Institutions (HEIs). Due to this increased importance devoted to entrepreneurship and its role in socio-economic development, a plethora of entrepreneurial educational and training programmes were created and implemented globally. Despite this plethora of educational programmes the socio-economic environment in many countries have not improved to address critical problems such as rising unemployment and skewed distribution of wealth. In order to address these critical problems the question that can be asked is whether transformation is required in the way entrepreneurship education is approached.

Coventry University has decided to contribute to the discussion on the dilemmas of socio-economic growth through a dynamic focus on transformational entrepreneurship. To steer such a process an International Centre for Transformational Entrepreneurship (ICTE) was created on 1 August 2015. This article firstly provides an overview of transformational entrepreneurship and its impact on entrepreneurship education and, secondly, sets out the approach of ICTE addressing entrepreneurship education.

It is commonly accepted that the global world is connected due to technological development. In this connected world, innovation breeds innovation and individual entrepreneurs find it difficult to act successfully on their own in such a competitive environment. Furthermore, the realisation that socio-economic development is under pressure of performing influences entrepreneurial educators to rethink the way they support entrepreneurship education within entrepreneurial eco-systems and debate how it should be transformed in order to address critical challenges in a constructive manner. Within this ecosystem context, for example, HEIs cannot change their entrepreneurship education practices in isolation without taking other sub-systems (i.e. role-players) into consideration. The question therefore is on what critical elements entrepreneurship education should focus to support transformation in the way socio-economic development is pursued. In this regard, Roth and DiBella (2015) state that five capabilities are required to enable systemic change, namely enterprise awareness (e.g. knowledge of the total industry in which one operates); innovation (e.g. innovation that has a wider impact); balancing push (e.g. actions from management side) and pull factors (e.g. new knowledge obtained by employees) of change; seeking growth (e.g. to scale-able businesses) and leadership (e.g. mobilising resources to improve socio-economic development). Entrepreneurship education has an important role to play to assist systemic changes that can lead to transformation. Entrepreneurship education should focus on improving the abilities of leaders to make a substantial contribution to socio-economic growth. Specific focus should be on:

• improving their holistic and heuristic abilities (ability to explore and asking questions such as why not? or/and what if?),
• improving their abilities to create innovation that can act as basis for further development (so-called second order innovation),
• learning what knowledge to gain and share on a continuous basis spearheading socio-economic development, and,
• learning how to support other players in the entrepreneurial ecosystem to achieve these transformational goals.

New knowledge and practices are essential for transformation, which necessitates the testing of existing entrepreneurship educational practices, keeping those that are fit for purpose, and develop new practices to replace obsolete practices. HEIs can and should do much more to ascertain that entrepreneurial education practices are truly supporting the current and future potential and existing entrepreneurs.

The creation of ICTE followed a strategic decision by Coventry University to contribute to activities that can spearhead socio-economic growth through a new focus on transformational entrepreneurship. The creation of ICTE followed a focus on micro enterprise under the auspices of the Institute for Applied Entrepreneurship (IAE) activities, which restructured into ICTE and the Coventry University Social Entrepreneurship Ltd company. With this change in focus, Coventry University is not arguing against traditional micro and subsistence enterprises. They remain important for cascading wealth to the broader society, but it is accepted that Coventry University can play a far more active role in the promotion of socio-economic activities.

ICTE’s focus is guided by the Coventry University Corporate Plan (Coventry University Corporate Strategy 2021), global phenomena and regional realities. The ICTE strategy builds upon these pillars and defines its mission as “utilising enterprise and entrepreneurship to foster leadership that can organise resources, act upon opportunities and create economic and social impact beyond the local level”. Furthermore, the purpose of ICTE is to promote enterprise and entrepreneurship through a systemic approach, bringing about transformation in socio-economic development.

There are five pillars underpinning ICTE’s mission and purpose, namely:
• Entrepreneurial leadership - which aims to forge a new generation of great entrepreneurial thinkers and doers globally.
• Entrepreneurial education – which aims to create new knowledge appropriate for the needs of specific communities to support transformational entrepreneurship.
• Innovation - to drive forward novel ways of doing business for the 21st century in a responsible manner.
• Sustainable socio-economic development - to ensure a healthy and equal society by meeting the needs of the present without compromising the needs of the future.
• Policy support - to analyse and promote enterprise and entrepreneurial policies that will enable transformational entrepreneurship.

ICTE accepts that it is not easy to scale up businesses from a traditional micro-enterprise mind-set. Therefore, through educational practices, ICTE will endeavour to support entrepreneurial mind-sets that can be labelled as transformational. Currently, all modules and programmes of ICTE are revisited to make adjustments towards transformational entrepreneurship. This will be no easy task because it calls for a total systemic approach which turns out to be a difficult process to change. However, if this is not done, what alternatives are there left for sustainable socio-economic development?

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**Prof Gideon Maas | Director International Centre for Transformational Entrepreneurship**  
Coventry University, UK

Prof Maas has broad international business and academic experiences. Over the past few years, he has created various entrepreneurship centres at different universities, developed and implemented undergraduate and post-graduate modules and programmes focusing specifically on enterprise and entrepreneurship. He was previously, amongst others, the Director of Futures Entrepreneurship Centre and Professor in Entrepreneurship at Plymouth University; Director of the Institute of Applied Entrepreneurship at Coventry University and owner-manager of his own consulting company.

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**Prof Paul Jones | Deputy Director International Centre for Transformational Entrepreneurship**  
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Prof Jones leads the research activity for ICTE. He is an experienced researcher with 180 research outputs including one edited book, five book chapters, 42 journals and 100+ conference and invited papers. Prof Jones is a Senior Fellow of the Higher Education Academy and sits on the Board of Trustees of the Institute of Small Business and Entrepreneurship (ISBE). He is Editor-in-Chief of the International Journal of Entrepreneurial Behaviour and Research and Associate Editor for the International Journal of Management Education.

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