House of Representatives Education and Employment Committee inquiry into matters that ensure Australia's tertiary education system can meet the needs of a future labour force focused on innovation and creativity

Submission from the University of Technology Sydney

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ABSTRACT

This submission addresses the terms of reference for the Education and Employment Committee inquiry into matters that ensure Australia's tertiary education system can meet the needs of a future labour force focused on innovation and creativity. It draws attention to issues concerned with skills for innovation and creativity and the way in which creative and innovative ideas are translated into application and implementation.

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Introduction

This Submission addresses the Terms of Reference of the House of Representatives Education and Employment Committee inquiry into matters that would 'ensure Australia's tertiary system can meet the needs of a future labour force focused on innovation and creativity; including the following:

1. The extent to which students are graduating with the skills needed for the jobs of today and of the future;
2. Matters relating to laws and regulations that may act as a barrier to education providers being able to offer qualifications that meet the needs of the new economy and fastest growing sectors;
3. Factors that discourage closer partnerships between industry; in particular small and medium enterprises, the research sector and education providers; including but not limited to: intellectual property; technology transfer; and rapid commercialisation.
4. Relationships between tertiary education entrepreneurship programs and private incubator and accelerators.
5. Other related matters that the Committee considers relevant.

The submission reflects our understanding that innovation is the *successful exploitation of new ideas*. It is reflected in new products, new services, new ways of running the business, or even new ways of doing business. Innovation is closely connected to creativity, the *generation of new ideas* – either new ways of looking at existing problems, or seeing new opportunities, perhaps by exploiting new technologies or changes in markets. Although popularly associated with art and literature, creativity is important in many other fields, such as business, economics, architecture, industrial design, and science and engineering.

There is a wide variety of skills required for innovation and creativity. People who are innovative and creative often additional skills, or opportunities to work with others in teams and organisations, to translate innovative and creative opportunities into products and services that create value for customers, the economy, and society.

This submission draws attention to the fundamental importance of business and management skills as the necessary capabilities to give effect to basic, knowledge, technical and creative skills. Business and management skills are essential for ensuring that current policy commitment to building innovation and entrepreneurship is realised in the form of business growth, international competitiveness and productivity improvement.

The submission makes a number of suggestions for recommendation by the Committee. These are summarised below. Page numbers are included to identify where suggestions are located.

- Leaders in the business and the tertiary education system continue to collaborate in developing stronger links in teaching and learning with the aim of developing workforce skills in entrepreneurship, innovation and creativity through specific courses and programmes, extension of work integrated learning strategies, appointment of business people to academic roles, and appointment of university executive staff to corporate governing boards and advisory committees. (10)
- Government innovation, science and research policy recognise the central role of skills in the translation of innovative and creative ideas into adoption and application in business contexts – and broader social, cultural and environmental settings. Government, tertiary education and business should collaborate to ensure that investments are made in the development of basic workplace skills, knowledge and technical skills, entrepreneurial and business skills, and the management and leadership skills necessary to grow and sustain globally focussed business. (11)
- The Commonwealth, States and Territories work towards creating a seamless and integrated tertiary education system with clear pathways between higher education and vocational training (and vice versa) as fundamental requirement for building a labour force focussed on innovation and creativity. (12)

- Business, the tertiary education sector and government look at the merits of apprenticeship degrees being developed and implemented in the UK as a means to lift knowledge, skills and experience for a labour force focussed on innovation and creativity. (13)
- Business and tertiary education continue to work towards developing stronger relationships around partnership, collaboration and trust. Universities should seek more business appointees to Councils and Senates, and business should invite academic leaders to join their own governing boards and committees of industry associations. (15)
- A *Skills for Entrepreneurship, Innovation and Creativity Investment Fund* be established to build and sustain skills capability in tertiary institutions working within high growth innovation districts and emerging local entrepreneurial ecosystems. Funding should be available for collaborations between universities, other research organisations, VET providers, RDA Committees and business groupings. (18)
- Skills development should be seen as continuous journey of career training activity that is fostered by employers and employees, and education and training providers. (18)

We would be happy to respond to any queries or questions regarding the Submission.

1. The extent to which students are graduating with the skills needed for the jobs of today and of the future

Skills overview

Drawing on a number of reports and papers, including the World Economic Forum report *The Future of Jobs* (World Economic Forum, 2016), a classification of the core skills and abilities for a future labour force focused on innovation and creativity is as follows:

- Basic skills – numeracy, reading and comprehension, written expression (literacy), active learning, oral expression, problem solving, critical thinking, self awareness, and digital literacy. These basic skills are sometimes referred to in the business community as *employability skills*.
- Knowledge skills – covering knowledge drawn from science, technology, engineering and mathematics (STEM) *and* the humanities, arts and social sciences (HASS). Knowledge skills lie at the foundation of 'knowledge organisations' which are now essential features of businesses in manufacturing *and* in the mining, agricultural and service industries.
- Technical skills – covering areas such as equipment maintenance, installation, repair, operation and control, machine programming and software maintenance, quality control, technology and user experience design, troubleshooting.
- Entrepreneurial skills – abilities related to starting a business, whether as a 'start-up' company, or as a new business venture in an established organisation, including an ability to focus on customer needs and end user wants.
- Business skills – covering implementation and administration of critical business systems and processes including, sales and marketing, accounting and finance, materials procurement and supply, project delivery, recruitment and motivation of employees and contractors, and management of time.
- Management skills - including judgment and decision-making, communicating and coordinating with others, emotional intelligence, negotiation, persuasion, organisation culture, training and teaching others.

These skills cover the ability to translate discoveries, inventions, *and ideas* into products, services, and new ways of organisation that create business value and value for the economy in lifting productivity performance and international competiveness. In a public sector context, the skills outlined have the potential to create *pubic value* for citizens in social, cultural, environment and national security contexts.

The skills for innovation and creativity are relevant not only to start-up companies and small to medium businesses more generally, but also to larger and established mature organisations. The mix of skill requirements varies, of course, across industry, organisations and sectors.

Skills for innovation and creativity are acquired through a combination of learning through families, the school system and the broader community, and learning on the job (experiential learning). The tertiary education system (higher education and vocational education and training) has a critical role in developing skills, but the role is complementary to learning in community and workplace contexts.

Basic skills

A recent OECD report on basic skills indicated that 10 per cent of Australian 16-19 year olds had low literacy levels (below level 2), and 18 percent had low numeracy skills. This compared with 21 per cent and 29 percent for the UK (Kuczera et al., 2016). The absence of this set of basic skills can be a major inhibitor of innovation.

Basic skills in problem solving, critical thinking, and communication are closely connected with innovation, and creativity. The OECD survey also pointed to a connection between literacy and numeracy skills and problem solving in technology rich environments. Employers, through heir business associations, have expressed concern about the level of basic skills, which they sometimes refer to as *employability skills*.

Digital literacy is becoming a key requirement in economic and social progress in this digital age, and is increasingly being regarded as a basic skill. There is a growing requirement for people to know how to programme (code), instruct, and repair machine and applications software. Digital literacy is also an important aspect of social and industry inclusion in securing the benefits of economic growth and social progress (Green and Howard, 2015).

A vital dimension of Australia's future innovation and creative labour force, across most occupations and industries, will be proficiency in basic skills, including skills relating to the development, adoption, and application of digital technologies.

Knowledge skills

In the framework of the knowledge economy, *knowledge workers* are regarded as having a critical role in improving business performance and lifting productivity. In policy contexts there has been a tendency to think that knowledge workers are people educated and trained in science, technology, engineering and mathematics (STEM) and attached to a university or a research and development division or group in an organisation. In this view, R&D drives business performance: knowledge workers are paid to think and everybody else is paid to to execute or implement. Public policies that subsidise business research and development, and very little else, reflect this thinking.

There have been several recent reports that have advocated giving greater priority to investing more in teaching higher education STEM disciplines, particularly in areas relevant to Australia's growth priorities[1]. STEM skills are regarded as critical to the success of R&D projects as well as the day-to-day operations of competitive firms (Office of the Chief Scientist (Professor Ian Chubb), 2014).

STEM skills are also seen to build a broader base of capabilities that link to innovation and creativity, by including many of the basic skills mentioned above such as problem solving, critical thinking, and digital literacy.

Thus, in the STEM oriented way of thinking, the skills for innovation performance are understood as essentially high-level science and technology skills (such as researchers' skills). These skills focus on the supply and production side of a business organisation, but overlook demand side considerations including knowledge of marketing and market access, communication and public relations, logistics, and sales and service. Knowledge in these areas relates to the humanities, arts and social sciences (HASS) disciplines.

In the contemporary view of a knowledge organisation, which employ innovative and creative people, everyone's knowledge counts, regardless of their roles or academic backgrounds. Every team member contributes, shares knowledge, and participates in making decisions, whether he or she is designing products, servicing customer accounts, creating tactical marketing plans, or determining long-term strategy.

Technical skills

Discussion about the delivery of knowledge skills tends to focus on the higher education sector, professional occupations, and connections with the research sector. Advocacy and reporting has tended to neglect the many operational, or technical jobs that require considerable STEM or HASS capability. These technical skills, acquired largely through the vocational education and training (VET) system, in house training, and experiential learning, are critical for translating and applying knowledge developed through research into practical application. Technical skills are very often in short supply.

Because of how the knowledge economy has been defined, policymakers have mainly focused on supporting workers with at least a bachelor degree in the STEM disciplines. In the US, the Brookings Institution has pointed out that *technical* qualifications are in demand and offer attractive wage and job opportunities to many workers with a post-secondary certificate or associate degree (Rothwell, 2013).

[1] Reflected in the industry growth centres strategy. See Department of Industry and Science. 2015. Industry Growth Centres Initiative. Available: http://www.business.gov.au/advice-and-support/IndustryGrowthCentres/Pages/default.aspx..

Box 1: The hidden STEM economy

Workers in STEM (science, technology, engineering, and math) fields play a direct role in driving economic growth. Yet the Brookings Institution has estimated that in the USA half of all STEM jobs are available to workers without a four-year college degree, and these jobs pay $53,000 on average—a wage 10 per cent higher than jobs with similar educational requirements.

Half of all STEM jobs are in manufacturing, health care, or construction industries. Installation, maintenance, and repair occupations constitute 12 per cent of all STEM jobs, one of the largest occupational categories. Other blue-collar or technical jobs in fields such as construction and production also frequently demand STEM knowledge.

http://www.brookings.edu/research/reports/2013/06/10-stem-economy-rothwell

Skilled technicians produce, install and repair the products and production machines patented by professional researchers, allowing firms to reach their markets, reduce product defects, create process innovations and enhance productivity. Most of the important enabling technologies being developed in research organisations and business require a capacity to develop and/or apply software, programme machinery and devices, and interrogate very large administrative and processor generated databases.

The 2014 *Australian Innovation System Report* notes that:

> Just like higher education, the vocational education and training (VET) sector is an important adjunct to the national innovation system. Skills that are attuned to vocational situations and the actual needs of the workforce are required to ensure that new and improved products and processes have technical and commercial applicability. Workers often need a combination of knowledge acquired from higher education and vocational education to realise workforce gains (Department of Industry, 2014).

Similar considerations apply in the HASS area, where technical skills drawn from business, finance, accounting, and the law, design and creative practice, health sciences, and human communication are also important for achieving innovation outcomes and economic growth.

Entrepreneurial skills

The development of innovation capability in an enterprise requires knowledgeable and engaged entrepreneurs who can structure relationships between scientific knowledge, technical skills, professional talent, creative insight, and business outcomes. In undertaking these tasks entrepreneurs draw in knowledge and ideas from 'non technical' disciplines such as management, finance, economics, statistics, psychology, sociology and cultural studies.

The *entrepreneurial process* starts with a perception of a potential business opportunity, or a situation where resources can be recombined for potential profit. An entrepreneur will develop these opportunities through the creation of a product or service that will be provided to customers. Entrepreneurs secure resources, design organisations (or other modes of opportunity exploitation) and develop a strategy to exploit the opportunity for a financial return (Shane, 2004).

To entrepreneurs, new technology is not necessarily a product differentiator. A breakthrough in product technologies may never end up being applied by entrepreneurs in a competitive market situation, or they may be short lived. Entrepreneurs understand that differentiation occurs on the *demand side*, through design, product positioning, marketing, distribution channels, and service content – all of which go towards establishing a sustainable customer base.

The recent policy discussion around entrepreneurial start-ups is sending a message that 'it is OK' to start a business and take a calculated risk. The discussion is being fuelled by the growing number of early stage venture capital funds, including, for example, Artesian ventures, and Blackbird ventures. Some of Australia's largest technology companies are also providing funding and supporting facilities for entrepreneurial start-ups. These early stage initiatives are often undertaken in collaboration with universities.

The prototypical start-up that flourishes in the venture capital setting has a technological solution to a mass problem – or opportunity. It produces something that has a high selling price, high margins and an expectation of being profitable in two to three years. Only a small number of new technology businesses, including those that are developing mobile applications, can meet these criteria.

The 'Silicon Valley' type venture capital backed start-up does dominate in some fields, such as drug discovery, e-commerce, and social media, where new companies have to invest significant capital

before they realise any revenues. But in most fields, the well-funded and carefully planned start-up is the exception. The vast majority of the entrepreneurial businesses are 'bootstrapped' – developed with minimal capital and following organic growth patterns.

The most noteworthy businesses quite often have somewhat unremarkable beginnings. Funding often starts with modest personal funds and ongoing financing sourced from cash flow or trade creditors. The reality of bootstrapped businesses is that entrepreneur owners have a dedication to selling something of value to a customer. They may attract small amounts of equity funding from 'angel investors' who take an interest in the business and the vision, passion, and business capabilities of the entrepreneur.

Whilst there is a high level of policy and public interest and support for entrepreneurial start-ups, it is important that policy continue to focus on entrepreneurs who have dedication to grow a business and sell something of value to a customer. The capacity to grow and develop these enterprises into sustainable businesses, that become significant employers of innovative and creative workers, depends very much on the availability of and commitment to acquiring business skills.

Business skills

Whereas *entrepreneurial skills* focus on what is required to start a business (either as a stand alone start-up or within an established organisation), *business skills* are required to sustain and grow a business organisation. They can be taken to cover, at a minimum, capability in the following business *functions*.

Typology of business skills

- General management - strategy, structure, resourcing, coordination and collaboration, monitoring and control, M&A, major projects, deal making.
- Innovation and new product development – new business development, product development and improvement, professional development.
- Marketing, communication, and engagement – seeking and retaining customers – the 4 Ps, tendering and quoting, building brand, CRM systems, websites, social media and digital mobility, business and professional networks.
- Project management – design and delivery of projects, including managing teams, meeting milestones, delivering on time and on budget.
- Finance, accounting, performance reporting - basic book keeping (recording financial transactions, GST, etc), banking and cash flow, working capital, billing and debtor management, management accounting, payroll, taxation (GST, payroll, company, licenses and fees).
- Human resources management – recruitment, staff development, training, OH&S, equity, workplace/enterprise agreements.
- Purchasing and procurement – order and inventory management, logistics and supply chain, management, creditor management, policies and procedures, employee credit card controls.
- Digital technology – business systems, standards, security, informatics, automation.
- Governance *and compliance* – board membership and roles (innovation vs. compliance), risk management, licenses and approvals, statutory reporting, asset portfolio, insurance portfolio, conflicts of interest, ethics.

These functional areas represent the essential 'corporate infrastructure' of a business. They have their own *specialisations, bodies of knowledge, proficiencies, and competencies* - acquired through education, training, reading, conversations with trusted advisers, and on the job experience. They represent a diversity of skills mixing which are developed and adapted to specific business situations.

Of the functional categories listed above, Innovation and new product development, and marketing communication and engagement, are probably the highest priority business skills required for start-up businesses to acquire and develop. *Without products, services, and customers there cannot be a business*[2]. Moreover, in a competitive environment, businesses must be committed to improving products and services and working to satisfy existing customers and generating new ones.

Many businesses develop business skills through 'learning by doing' and through networks, mentoring and consultancy advice. Many start-ups and high growth businesses tap into local innovation ecosystems where people can build trust based relationships and acquire necessary general

[2] Unless the business is financed by a continuous stream of government grants. There is a flourishing industry of grant writers who assist business get government grants.

management, financial management, and HR capability support. But eventually, a more structured framework is required.

In certain segments of the entrepreneurial business environment, particularly in the creative industries sector, many businesses are not easily scalable. It is therefore important that entrepreneurs have the capacity to acquire the business skills and capabilities that are appropriate to the scale of operations. Tertiary education courses and programmes play a significant role in supporting the development of these skills. Course and programme delivery are highly regarded when developed around the operational characteristics of these businesses.

When a business reaches a certain stage in its growth there is a need for a 'step change' investment in business infrastructure to capture economies of scale and extended markets through specialisation of occupational function and division of work. This requires investment in business skills, and the tertiary education system has a critical role in supporting the development and application of these skills, particularly those that are relevant to building and sustaining innovative and creative enterprises.

Management and leadership skills

In the contemporary business environment, it is not enough to be a great scientist or engineer, or even being adept in the application of digital technology, to create and sustain a business. A well-rounded, competent, and balanced *management* capability is fundamental.

It has been acknowledged for some time that we live in an 'organisational society' (Presthus, 1962). Management, and managers are the elements that hold an organisation together and make it work. While many business organisations come into being as a 'start-up', and are run by their owners, at a very early stage in the growth trajectory a business will require management and managers. *Entrepreneurs must become managers, or if they don't they will be replaced, or the business will most likely fail to survive (Drucker, 1994).*

The scope of management skills relevant to building an innovative and creative workforce in an organisational environment are listed below.

The scope of management skills

Management skills cover the work of a manager in areas such as:

- *Setting objectives*: Deciding on the objectives and goals for the business and units within the business; deciding what should be done to reach objectives and achieve goals; and communicating them to people whose performance is needed to attain them.
- *Organising*: Analysis of the activities, decisions and relations required to achieve goals; Classifies and divides work into manageable activities, units, and jobs; Groups units into an organisation structure; Selects people for the management of units.
- *Motivating and communicating*: Making a team out of people responsible for various jobs through building relationships, providing incentives and rewards, promotion policy, and constant communication.
- *Measurement*: Deciding what measures are available; Ensuring that measures reflect performance of the whole business and at the same time hep people do their jobs; Undertaking analysis of performance, conducting appraisals, and making interpretations; Communicates meanings to subordinates and superiors.
- *Develops people*: How well or how poorly subordinates develop themselves in their work depends directly on the way a manager manages

Drucker, Peter F. *People and Performance: The Best of Peter Drucker on Management*. Oxford: Butterworth Heinemann, 1995.

Running through these skill areas is the *capacity to make effective decisions.* Managers are also expected to have capabilities such as leadership, ability to listen and take advice, mentoring, coaching, fairness, and honesty. *Ability to retain the confidence and trust of boards, CEOs, and Executive Mangers is fundamental*. Management skills also cover traits like aggressiveness, prudence, follow-through, and speed – traits related to decision-making and execution.

In growing businesses, CEOs still require domain, or industry knowledge. They also require a capacity to collaborate, build trust within innovation ecosystems, and integrate capabilities from a number of sources to create sustainable business models. 'People skills' are seen as absolutely critical.

Management capability may be nurtured in people with science and technical capabilities by learning on the job (with guidance from supervisors), mentoring, training, and development support. Quite often though, as science or technology start-up businesses grow, and particularly in situations where they have received venture capital, investors seeking fast growth will replace the science and technology founder with an experienced manager.

Implementation of innovation initiatives, particularly business model innovation in larger organisations, also requires skills and capabilities in *change management*. New challenges are emerging, in the *management of risk*, such as cyber security and management in a transparent world (Austin and Upton, 2016). There is a view within business organisations and the innovation policy community that boards and management might be overly focussed on risk avoidance to the detriment of innovation.

Business perspectives on the availability of skills

On the basis of recent discussions with business organisations it is apparent that business does not have a problem about the *knowledge and technical skills* that come out of the tertiary education system. Business place a priority on *workplace employability skills.* There is a view that technical skills can be acquired or updated on the job – particularly where technical activity is largely driven by software. Businesses also acquire high level knowledge and technical skills from consulting firms, contractors and, potentially, universities and research organisations.

Some businesses have very specific technical needs that are not quite being met, so they are having to do a lot of training in this area. Universities are seen to be trying to adapt to that, but businesses want basic skill of aptitude and wanting to learn, and an understanding how a workplace operates.

There is a concern within the Australian business community that the [student] demand driven university system has has not worked well enough to deliver the technical skills that individuals and the nation require for innovation and creativity. Many of these skills are delivered through the VET system. But, for some reason in Australia, a higher status is accorded to university education compared to VET. This is in contrast to the German system of tertiary education where academic and technical institutions are accorded equal status.

There is a view in the business community that universities and VET institutions have a role to develop entrepreneurial and business skills and that leaning these capabilities should be included in undergraduate courses. As indicated below, some universities are heading in this direction, whilst others are not convinced that students will demand it. Under the demand driven system both universities and VET have an economic and financial incentive to provide courses and programmes where they see the demand.

Under the demand driven system business has limited opportunity to influence demand, unless it contributes to the cost of education and training by paying student course fees that are currently paid by students through the FEE-HELP system. There is a role for businesses, particularly at the regional level, to advise students of employment and work opportunities. There are indications that potential students prefer to hear these messages from employers rather than education providers and third parties[3].

There has been a history of Australian companies and public sector agencies offering cadetships and traineeships for school leavers and students at the start of or part way through their degree programmes as a way of integrating knowledge, technical, and workplace learning. These now appear to be less prevalent and arrangements are shorter term.

From a business perspective, work based learning requires a strong resource commitment of people, time and money, sometimes including an obligation to pay award rates. There is also a concern that students may have under-developed workplace skills. But, at the same time, workplace learning provides an opportunity to screen and identify talent for future employment.

The commitment of time and cost for supervision, mentoring and guidance is a significant constraint on capacity to offer workplace learning opportunities, particularly in small to medium size businesses. Many larger companies now offer shorter term internships and work experience, and some of these are supported by government and industry organisations. In ICT most students in 'demand' areas like computer science, software engineering and project management have fulltime work by the time they graduate.

Internationally businesses and governments are supporting a range of initiatives to develop knowledge, technical and workplace skills, including:

[3] As covered in the Smart Services Strategy for the Hunter Region

- Subsidies for employee training, including tax incentives
- Subsidies to develop vocational training programs at the firm or sector level
- Recruitment of researchers, technicians, PhDs and Post docs in firms
- Schemes to allow personnel to gain higher degrees whilst working in firms
- Schemes to support innovation management in businesses
- Degree apprenticeships as a way of developing knowledge, technical and workplace skills. This is addressed further below (see page 12).

University teaching and learning initiatives that address skills for innovation and creativity

Universities have a long standing responsibility to deliver education in a context of 'self-leadership'. This involves developing a range of skills, and not just imparting knowledge contained in a textbook or in a lecture. Teaching people how to work in teams, how to be creative or to harness their creativity is recognised by senior university executives as being very much part of education.

Individual universities are approaching the issues differently, sometimes centralised and sometimes distributed across faculties and centres, with a follow on matters concerning coordination across academic 'silos'. Collaboration is facilitated with strong executive and academic leadership and a commitment to address student demand and subsequent workplace opportunities. Graduate employment outcomes has become a significant indicator in the demand driven system.

Most universities have made commitments to *campus master plans* to guide investment in teaching and research facilities over the medium to longer term. Many of these plans provide for *collaborative 'learning spaces' and 'hubs'*, with several in 'down-town' or CBD locations. This is associated with the inclusion in subject and course design provision for collaborative learning in groups and teams, and provision for group assessments. This meets with some resistance from students over 'free-riders'.

Australian universities are investing in a range of initiatives that support *student and staff involvement in entrepreneurship, innovation and creativity.* Several universities, including, UTS, Swinburne, and Canberra, have been offering courses and programmes in entrepreneurship for many years. However, post graduate programmes have not been well regarded, due to their emphasis on research and publication rather than experiential learning.

The recently launched UTS Business School *Master of Business Administration in Entrepreneurship* is a unique one year intensive MBA designed for entrepreneurs and innovators that focuses almost entirely on practice based learning.

UTS MBAe Programme

. The programme is designed to enable participants to:

- Take business ideas up to venture capital grade
- Understand what makes entrepreneurs successful
- Become immersed in an entrepreneurial environment working on live projects
- Develop, test and launch ideas, in collaboration with aspiring entrepreneurs and innovators.

The Programme is directed towards the following outcomes:

- Knowledge with impact: Research and programmes are developed with industry for industry.
- Learn from the experts: Teaching by leading academics and practitioners who cut their teeth doing exactly in industry, and who bring in a global network to our doorstep.
- Reality-based rigour: Live case studies, with real clients, provide the ultimate opportunity to apply what learning, all while being mentored by a who's who of corporate leaders

The Programme is uniquely constructed as three short courses to enable choice between how, when and what to focus on whilst developing, with increasing confidence, your own enterprise ideas. The elements are:

- Graduate certificate in commercialisation
- Graduate certificate in entrepreneurship
- Graduate certificate in new venture funding

http://www.uts.edu.au/future-students/business/business-study-areas/mba-and-executive-mba-programs/mba-entrepreneurship

Universities are also increasing their focus on teaching and learning in creativity and innovation. This has required collaboration between business schools and arts and design schools and faculties.

UTS, for example, has recently introduced the *Bachelor of Creative Intelligence and Innovation*. This course provides an understanding of important aspects of business and offers a wide choice of majors and sub-majors. A wide variety of international exchange options are available. The programme utilises multiple perspectives from diverse fields, integrating a range of industry experiences, real-world projects and self-initiated proposals. It aims to equip graduates with skills to address the 'wicked problems, complex challenges and untapped opportunities in today's world'.

UTS advises students in the course prospectus -

> By focusing on the high-level conceptual thinking and problem solving practices that lead to the development of innovative, creative and entrepreneurial outcomes, students of the combined degree also gain leading edge capabilities that are highly valued in the globalised world, including dealing with critical and creative thinking, invention, complexity, innovation, future scenario building and entrepreneurship, and the ability to work on their own, across and between other disciplines. These creative intelligence competencies enable graduates to navigate across a rapidly accelerating world of change.

Most Australian universities have strategies for formalised *Work Integrated Learning (WIL).* Universities Australia sees, from a whole of sector perspective, a need to work with business peak bodies to scale up work-integrated learning significantly. There is, of course, a number of disciplines for where WIL has been core business for many years. There is a history of clinical, teacher, and engineering student placements. In many areas, universities have to make a payment to secure for student placements.

Universities Australia and peak industry organisations have developed a *National Strategy on Work Integrated Leaning in University Education* (Universities Australia et al., 2014) . There is a strong view that WIL should address the development of *both* technical and professional skills *and* workplace/employability skills. In many universities, including UTS, academic policy is that all students should have an opportunity for an internship, or 'internship like' experience, which can include working in a new business incubator or student consulting project.

In some professions, such as accounting, finance and the law, demand for internships by students is now so high that they will work for free in in order to build 'employability' experience. It is not clear whether these placements are delivering employability skills as distinct from low level technical skills. However, it is a refection of young people taking greater responsibility for their own 'employability' profile – and forms an important part of contemporary résumés.

Universities advise that, with the growth in student numbers, placements are becoming difficult to find, and are becoming more expensive. There are still issues to resolve around whether work can be paid or unpaid, how much should be part of a student's assessment, and whether businesses should be part of the assessment process. There may be academic board procedures around assessment of paid work. If students are not paid, industrial relations issues may arise.

Universities have for many years sought to *engage people with business experience in teaching* through casual and honorary appointments and alumni networks. Part time tutors are extensively recruited from business and professional organisations. Alumni can be incentivised to 'give back' through participation in teaching and learning. However, Australian universities tend to be quite unsophisticated in engaging with alumni compared to North American, UK and European counterparts.

The Committee should consider recommending

> **Leaders in the business and the tertiary education system continue to collaborate in developing stronger links in teaching and learning with the aim of developing workforce skills in entrepreneurship, innovation and creativity through specific courses and programmes, extension of work integrated learning strategies, appointment of business people to academic roles, and appointment of university executive staff to corporate governing boards and advisory committees.**

Conclusion: Management matters

Running through the discussion of skills for creativity and innovation is the overarching importance of management, and the significance of organisation to coordinate the activities of people to achieve the goals and objectives of a business (Maciariello and Linkletter, 2011). Management provides the

leadership and direction for people and technologies who might otherwise be pushing and puling in opposing directions. It defines the mission and purpose of a business and seeks to encourage a commitment to achieving outcomes and results. As a practice and a liberal art, management draws on knowledge generated in the humanities and social sciences to generate effective performance.

Contemporary policy discussions in Australia have tended to underplay the importance of management. This may reflect the predominance of micro and small businesses in the Australian industrial structure. Management is a tough job in a globally competitive business climate, and requires high levels of skill, knowledge and experience to address the details involved in the *implementation and execution* of plans and strategies, particularly those around innovation and creativity.

Management is required when an organisation reaches a certain size and complexity, when a variety of tasks has to be performed cooperatively, and in synchronisation, to meet purposes and achieve goals. As businesses grow the tasks of management become more complex and demanding – and despite some contemporary rhetoric, it is not possible to keep running a business with a 'free wheeling' start-up philosophy. Research and practice has demonstrated that large organisations can be agile, flexible and responsive to changes in technology, markets and consumer wants.

The perception of management performance among Australian *employees*, relative to other countries has been dropping, with Australia's ranking falling from 8th in 2009 to 18th in 2014 on global rankings in the International Institute of Management Development (IMD) survey of business attitudes and values. The survey asks employees across the world about various elements of leadership and management, including attitude towards globalisation, national culture, level of flexibility and adaptability; that is our ability to be flexible and adaptable (Australian Industry Group, 2015).

Graduate Schools of Business have an important role in developing management skills, but their performance has been criticised as being too academic and theoretical. This was addressed in the report of the Council of Business Deans, with recommendations for more case study based learning and work based projects and attention to 'softer skills' (Australian Business Deans Council, 2014). There are indications of change for the better. It is also a concern internationally.

Research for the *Management Matters* Report (Green et al., 2009) found that the quality of management practices has a measurable impact on labour productivity, as well as sales and the number of employees in firms. Australian management practices rate as only moderately above average when benchmarked globally, leaving significant scope for consistent and sustained improvement across key areas. Despite the findings of this report, and earlier studies of management capability (Australia. Industry Task Force on Leadership and Management Skills, 1995), very little policy attention has been given to improving Australia's management capacity and capability.

The Committee should consider recommending:

> Government innovation, science and research policy recognise the central role of skills in the translation of innovative and creative ideas into adoption and application in business contexts – and broader social, cultural and environmental settings. Government, tertiary education and business should collaborate to ensure that investments are made in the development of basic workplace skills, knowledge and technical skills, entrepreneurial and business skills, and the management and leadership skills necessary to grow and sustain globally focussed business.

2. Matters relating to laws and regulations that may act as a barrier to education providers being able to offer qualifications that meet the needs of the new economy and fastest growing sectors;

The separate policy contexts and administration of the HE and VET systems

Higher education policy and vocational education policy are handled separately between Ministers and Departments, and between the Commonwealth and States/Territories. Universities are funded by the Commonwealth and operate as public organisations with their own enabling statutes and academic boards, which accredit their own courses and programs. VET courses are accredited by the Australian Skills Quality Authority (ASQA), and delivered by registered training organisations (RTOs) which include State owned technical and further education (TAFE) institutes.

There has been renewed interest in the role of the VET sector delivering knowledge based capabilities and higher education sector has taken an interest in skills from the perspective of the employability of graduates, there are opportunities for greater integration in education and training programme design and delivery. Greater connections between higher education and VET will lift opportunities for linking with industry, as the VET sector has always had a strong industry interface.

There is, however, an imbalance in policy focus between the higher education and vocational raining segments, and relative resourcing between them is a matter of national concern. Higher education has gone through an evolution, from the Whitlam government policy 'anyone can go to university', to the Gillard Government demand driven system, combined with inducements to lift access by students with low social-economic status (SES). The effect has been that university enrolments have boomed and the demand for vocationally oriented education (particularly trades) has dropped off. State Governments have been severely reducing their commitments to the VET sector

There is a view, however, that the tertiary education system is inappropriately encouraging young people to enter university, and see a a bachelor's degree as the only path to material success. Students and parents often prefer the prestige of universities – which is in contrast to the German tertiary education system where higher education and VET have similar status.

The VET sector continues to play a key role in training people in a range of technical professions and occupations. The Australian VET system is just one of a few in the world where a trainee is assessed by his or her acquisition of *competencies* relevant to a field of skilled specialisation. Australian TAFEs tend to have very strong industry interfaces, and in addition to delivering national industry training packages, they offer a range of 'be-spoke' training courses and advice in specific areas of technology.

Whilst there are many good examples of cross-institutional education cooperation and student articulation between VET and universities (in-built within some institutions), they tend to be institution specific with little commonality within and between States/Territories.

The committee should consider recommending

> **The Commonwealth, States and Territories work towards creating a seamless and integrated tertiary education system with clear pathways between higher education and vocational training (and vice versa) as fundamental requirement for building a labour force focussed on innovation and creativity.**

Modernising the apprenticeship system

In Australia the apprenticeship system is in serious difficulty, with only 2.5 per cent of the workforce undertaking apprenticeships, and most of those being with small business. There is a need for the apprenticeship system to be modernised to reflect the contemporary and evolving demand for workforce skills and capabilities, particularly in the areas of innovation and creativity.

Internationally, governments are looking at measures to bolster the support for *apprenticeships* and open up pathways for *higher level apprenticeships*. In Germany apprenticeships are supported across a broad range of occupational categories, and are not focused on the trades or 'blue collar' workforce.

The merits of apprenticeships have been recognised and emphasised by the Cameron Government in the UK, where current policy is to recruit an additional three million new apprentices across a broad range of industry categories. The scheme is part funded by a levy on companies to help pay the costs of training fees. *UK Degree Apprenticeships* combine a full degree with the practical skills gained in work and the financial security of a regular pay packet. They aim to 'bring the world of business and the world of education' closer together, and build the high-level technical skills needed for the jobs of the future.

Entry standards for degree apprenticeships are higher than traditional apprenticeships, with off the job training blending both vocational and university courses. This reflects a requirement by companies for higher skilled apprentices who are more employable in the longer term. This is coupled with collective industry input into higher quality design of apprenticeships under the *Trailblazers* programme[4].

Under the apprenticeship degree arrangements Apprentices split their time between university study and the workplace and are employed throughout, gaining a full bachelor's or master's degree from a top university while earning a wage and getting on-the-job experience in their chosen profession. A degree is an integral part of the apprenticeship, co-designed by employers to make sure it is relevant for the skills industry is looking for.

The cost of course fees are shared between government and employers, meaning that the apprentice can earn a full bachelors or even a Masters degree without paying any fees. As well as being suitable for school leavers as an alternative route to gaining a degree, the new qualifications are expected to strengthen the vocational pathway and be suitable for existing apprentices looking to progress in their career.

In *Germany*, once students have completed full-time compulsory schooling (usually age 18), they may enter the dual system for two, three or four years (depending on the prior qualification or the occupation). The dual system is a highly standardised and regulated system in which apprentices combine paid work with training. About 66 per cent of students move into the dual system.

There are 1.5m people doing an apprenticeship in Germany's dual system. On average, more than 500,000 new trainees start an apprenticeship every year. The programmes are co-operations between companies and schools, but rather than ad-hoc commitments, each partnership is based on a unified national programme.[5]

In 2015 the *Obama Administration* committed $175 million to encourage and expand apprenticeship across the U.S., and in his FY 2016 budget the President asked Congress for another $2 billion to establish an Apprenticeship Training Fund.

These developments suggest a need for Australia to look at the apprenticeship system in a broader context than acquiring blue collar trades skills and, particularly, as a means to develop an integrated approach system to the development and delivery of knowledge, technical and workplace skills that meet the requirements for innovation and creativity. It would be the logical next step in the development of work based learning in both the higher education and vocational education and training sectors.

The Committee should consider recommending;

> **Business, the tertiary education sector and government look at the merits of apprenticeship degrees being developed and implemented in the UK as a means to lift knowledge, skills and experience for a labour force focussed on innovation and creativity.**

In the UK there has been substantial growth in numbers of higher or degree apprenticeships in advanced technology, construction, and digital media. These skills and capabilities are in demand across all industry segments in Australia.

[4] Groups of employers (trailblazers) have been taking a lead role in carrying out the changes to apprenticeships. They have been working together to design apprenticeship standards and assessment approaches to make them world class.
[5] https://theconversation.com/german-apprenticeships-are-built-on-a-cohesive-national-plan-not-ad-hoc-partnerships-23210

3. Factors that discourage closer partnerships between industry, in particular small and medium enterprises, the research sector and education providers.

Arrangements for encouraging closer partnerships between industry, SMEs, the research sector and tertiary education providers have been canvased extensively over the last five years, including the Report prepared by UTS for the Senate Economics References Committee Inquiry into Australia's Innovation System, *Australia's Innovation Future* (Green and Howard, 2015).The following comments provide additional context.

Absence of an entrepreneurial culture

Many people in business have a view that there is *an absence of a culture of enterprise innovation* in Australian academic institutions. This observation is being made notwithstanding the substantial commitment by universities to building entrepreneurial teaching capability.

Businesses think that It is not widely appreciated in the academic community that business enterprises are the vehicles by which research, development, commercialisation, and the realisation of the returns on that effort, is delivered. There is still antipathy among researchers towards business and a feeling of: 'I don't want business to be making money out of my idea', notwithstanding the very high costs, level of knowledge and expertise, the complex business processes, and the risks involved in bringing an idea to market.

This is being seen as a serious national issue, in part explained by our economic and social history which has involved a strong public sector, a commodity culture in production and export, a system of robust economic and social safety nets, and an expectation that government should absorb business risks. There is still a high profile given to many of Australia's rogue entrepreneurs. Australian business and industry organisations have not very successful in demonstrating how entrepreneurship and calculated risk taking has created value for the economy.

With the release of the National Innovation and Science Agenda Statement, combined with initiatives in universities around entrepreneurship the outlook is much brighter. National Industry organisations should support the development of an entrepreneurial culture by highlighting and showcasing successful entrepreneurs and business leaders and the way they have build their businesses. They should also highlight those areas where success has been realised with limited government assistance and support.

Mismatch between research commitments and industry requirements

A large proportion of Australian public research is undertaken in areas where industry 'receptors' are absent. This makes 'translation' particularly challenging in the Australian domestic context. QUT DVC-R Professor Arun Sharma summarised the position in an op-ed piece in 2013:

> In 2010 businesses spent 52 per cent of their R&D outlay on engineering, while universities spent 9 per cent. Businesses spent 28 per cent on ICT and universities spent 4 per cent. On the other hand, while universities spent 38 per cent of their research expenditure on medical and health sciences and biological sciences, the comparable figure for business is 6 per cent.
>
> Universities and businesses do not have to be totally aligned in their research investment, but the disparity in the Australian context is serious. It almost appears the research capacity in universities has evolved independently of the innovation needs of the economy (Sharma, 2013).

The characteristics of the research environment impacts directly on the requirement to develop skills for the translation of research outcomes into application and use. Whilst Australia performs adequately in the translation of biomedical research into clinical procedures and amelioration of chronic diseases, there are limited opportunities for translation in other areas – the research simply isn't being done on sufficient scale and intensity to meet potential industry demand.

In recent years, governments in many countries have undertaken significant efforts to increase the amount of STEM (science, technology, engineering and mathematics) graduates produced by their national education systems. This has been a focus of attention in Australia. But while employment trends generally corroborate the importance of these efforts (particularly in computer science and

software engineering), it is apparent that the potential net job creation in absolute terms in the STEM field alone will not be sufficient to create opportunities other parts of the labour market (World Economic Forum, 2016).

There must be a broader recognition that research in the the health sciences, as well as in the humanities, arts and social sciences also has the potential to be adopted and applied in industry, particularly in the services industries including, but not limited to health, construction, banking, insurance, and education itself. The public sector, which makes up 25 per cent of the economy, and has a major challenge in productivity which can be addressed through innovation and creativity.

Industry-tertiary education relations

Business relationship with universities at the Vice-Chancellor-CEO level is usually good, and it's getting better. CEOs sit on university advisory boards and are often invited to join University councils. The Chair of the Business Council of Australia is taking up the role of Chancellor at UTS later in the year. There are fewer senior academic appointments to industry governing boards, or to governing councils of national or State/Territory industry associations, however.

Collaboration at the faculty and with individual academics is very much dependent on the way industry requirements cam be built into research programs and projects. This requires moving away fro a transactional approach, around the 'buying and selling of knowledge' to a partnership and joint venture approach development around engagement and trust.

There have been numerous suggestions for *academic workloads and performance agreements* to recognise, and incentivise, academic staff to engage more with industry. This means that academic promotion criteria should also give more weight to industry engagement, particularly where the work involves consultancy and expert advice rather than commissioned research (which is captured and recognised as Category 3 research funding). Business can assist in developing these relationships by ensuring that potential research projects are framed as collaborations and set out in research terminology.

The drivers for collaboration are growing much stronger because the workplace is changing, and the economy is starting to shift away from a commodity orientation to an emphasis on knowledge and knowledge intensive services. In this context there is an understanding that universities have to be closer to business to 'give their students that competitive advantage' in getting a job.

The Committee should recommend that:

> **Business and tertiary education continue to work towards developing stronger relationships around partnership, collaboration and trust. Universities should seek more business appointees to Councils and Senates, and business should invite academic leaders to join their own governing boards and committees of industry associations.**

There are many examples of how these arrangements are working across the system, but there is scope for further development and extension.

4. Relationships between tertiary education entrepreneurship programs and private incubator and accelerators

Regional and local innovation ecosystems are becoming increasingly important as a foundation for industry development and transformation. Systems emerge around large technology intensive businesses, technology entrepreneurs, universities and venture capital investors, to create vibrant creative communities with strength in both soft and hard infrastructure (Green and Howard, 2015).

Increasingly, universities are getting behind the development of these ecosystems. There are a number of ways that tertiary education entrepreneurship programs interaction with private incubators and accelerators. These are outlined below.

Teaching entrepreneurship

Universities are being encouraged to increase their commitment to teaching in entrepreneurship. A recent report for the Office of Chief Scientist Report set out a way in which universities could teach entrepreneurial skills and provide an environment that encourages students to explore high-impact entrepreneurship as an alternative to traditional career paths (Kinner, 2015) .

The report finds the following desirable attributes for developing entrepreneurial skills:

- Strong engagement between the university and the local start-up ecosystem.
- Courses delivered by experienced entrepreneurs.
- Students given multiple opportunities for engagement—ranging from short courses to immersive programs such as internships and overseas placements.
- Programs support multi-disciplinary collaboration that includes STEM.

Many initiatives in these areas are well underway across the university sector.

Up until five years ago universities were not really concerned about entrepreneurship because they wanted enrolments and student numbers to go up, and they wanted good ATAR scores. In the last five years, and increasingly in the last two, it has been noticed that students are looking around 'entrepreneurial exposure' and courses that will teach then how to be an entrepreneur. It is very much a bottom up process, and it is demand led. The initiatives started in the engineering and business schools, but it is now more pervasive across faculties.

UTS is seen to have done a good job in connecting the components together, and probably more so than the other universities. UTS is seen to have been doing this for longer, and is more attuned to the advantages of being close to business, and improving student experience than the other universities. It is suggested that this is because UTS doesn't have the scholarly brand and academic reputation to rely on, and has had to work harder in going in this direction. Some initiatives are described below.

Business Plan Competitions

Universities support *innovation contests and tournaments*, including InnovationACT, the RMIT Business Plan Competition and the UTS 3P Business Plan Competition. Private incubator and accelerators are often keen participants, and sponsors, in these competitions.

The UTS 3P Business Plan Competition is an annual business plan contest for UTS students. The competition gives students the chance to explore creative and innovative business ideas whilst being mentored by business professionals. The challenge requires students to develop a new, innovative product/idea or service associated with the 3Ps. The teams are required to develop their ideas into a viable business cases submitting a ten page business plan for judging

Students attend an initial briefing session to hear from the mentors about idea generation and how they will help throughout the competition. Over four weekends (leaving a gap for exams and holidays) teams meet with individual mentors to discuss their ideas and develop their business plan. Business plans are submitted for judging and six finalists are chosen to present their cases to the judging panel for final assessment. Team Prizes for the 2015 competition were: 1st Place $10,000; 2nd Place $7,500; 3rd Place $5,000. A prize winner has represented UTS in the University Start-up World Cup

UTS student start-up Construction Cloud represents Australia at University Start-up World Cup

Sydney start-up Construction Cloud has represented Australia at the University Start-up World Cup after winning the fifth annual 3P Business Plan competition at the University of Technology Sydney.

The start-up, founded by engineering students Hartley Pike and Jan Schroeder, and Samuel McDonnell, an industrial design student, has created a SaaS application that looks to improve on current construction project management systems. It increases the efficiency of the processes associated with multimedia data, including photographs and video that occur during large-scale construction projects.

The idea came from Pike's experience working with engineering firms, seeing how poor communication and management of project files loses companies both time and money. Processes currently used in the construction industry see files manually transferred from a device to a project's public drive.

"Because it is so inefficient, a lot of the time it simply doesn't happen. The result is that at the end of the project, we have no access to the visual information that we need," Pike said. This can prove costly if there are problems with or disputes regarding a project.

Professor Zoltan Matolcsy of the UTS Business School Accounting Discipline Group, organiser of the 3P Business Plan

competition, said this is the first time the competition has been won by a team consisting of students from the engineering and design faculties.

The Construction Cloud founders travelled to Copenhagen for the World Cup. The event, which saw entries from over 3000 universities around the world, divided the 50 finalists into five categories: cleantech and environment, life science and medtech, mobile and web, product and technology, and social entrepreneurship.

Source: http://www.startupdaily.net/2015/09/uts-student-startup-construction-cloud-represents-australia-at-university-startup-world-cup/

Previous prize winning ideas have included an industrial lift, a digital textbook service, safer, fashionable and practical scooter attire, crowd sourced fashion website, an online art platform, thermoelectric generation devices and a home automation system.

Creative hubs and precincts

A number of universities have made major commitments to the development of *science and technology hubs and precincts* to build linkages between research, innovation, and industry adoption and application. Many provide opportunities for internships and other forms of work integrated learning. Many university campus master plans are also being drawn up around the development of communities and 'suburbs'.

Piivot, Sydney's Creative Hub, is a partnership of technology start-ups, digital, creative, cultural, corporate, government, and education organisations centred on digital creative innovation. The initiative is directed towards start-ups, entrepreneurs, partners, investors and students looking to connect, learn and work together.

Piivot has been incubated at UTS, in Ultimo, "right in the heart of the digital creative ecosystem" - characterised by warehouses, cafes, co-working spaces, and entrepreneurs connected to the Sydney CBD and the inner city start-up and creative scene. Piivot has been named one of the top 15 places in the world for innovation. Piivot programmes and initiatives include:

- The Hatchery "pre-incubator" programme is designed to specifically create entrepreneurs not companies. The Hatchery is a safe and secure environment for students to be provided with the scaffolding to support the 'hatching' of their entrepreneurial talent.
- Springboard Enterprises Australia - a highly scrutinised expert network of innovators, investors, and influencers who are dedicated to building high-growth technology-orientated companies led by women.
- City of Sydney start-up pilot projects – projects that aim to support entrepreneurs in creative and technology start-ups (in development). They will focus on creative enterprises, specifically new, innovative businesses that have technology at their core and are designed for fast growth.
- Pollenizer – a 60 day Start-up Programme. Australia's first start-up incubator e to help start-ups grow.

University sponsored incubators and accelerators

There are at least 14 *university sponsored incubators and accelerators* distributed across the higher education sector (Howard, 2015). These initiatives are directed towards producing technically capable and entrepreneurially enthusiastic young people with a desire to start a business and make a serious commitment. There are also Student enterprise initiatives, such as the Monash Entrepreneurs club.

The UTS *Hatchery Pre-Incubator* is designed to give students start-up skills and to educate and launch the entrepreneurs of the future. UTS is aware that today's students and tomorrow's graduates will follow very different career paths to previous generations. Many of them will choose start-up and entrepreneurial careers over traditional jobs. Organisations are also changing, with employers increasingly valuing entrepreneurial skills.

The Hatchery prepares UTS students with the skills and expertise needed to confidently take their business ideas to the next level of development. Hatchery participants learn the groundwork needed to pitch their own ideas to the thriving industry incubators and accelerators in the precinct such as

Fishburners. These skills will also be valuable to aspiring intrapreneurs seeking to innovate within organisations.

The Hatchery program is designed specifically to create entrepreneurs – not companies. However, graduates from the Hatchery looking for help in developing commercial opportunities will be able to access further advice from UTS experts, mentors, and precinct partners. It seeks students who will bring the exceptional knowledge and skills they are developing while studying at UTS, while being willing to experiment and explore new ways of responding to social and commercial challenges.

The Committee should consider recommending

> A *Skills for Entrepreneurship, Innovation and Creativity Investment Fund* be established to build and sustain skills capability in tertiary institutions working within high growth innovation districts and emerging local entrepreneurial ecosystems. Funding should be available for collaborations between universities, other research organisations, VET providers, RDA Committees and business groupings.

This recommendation would complement the NISA Incubator Support Programme[6] that will provide matched funding support to new incubator proposals, activities of existing incubators, and an expert-in-residence component that supports secondments of experts to build linkages and networks. The NISA initiative does not appear to be focussed on developing skills.

5. Other related matters that the Committee might consider relevant

Lifelong learning

Some of the universities have a significant business in the area of business training. But it is often only in a 'one-off' training context. There is a category of people who are going through education and training now, in their 20s to early 30s, but may need training over a career, or for 'all-of-life'.

The Committee should consider recommending

> Skills development should be seen as continuous journey of career training activity that is fostered by employers and employees, and education and training providers.

[6] http://www.innovation.gov.au/page/incubator-support-programme

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