Submission to the Department of Innovation, Industry and Science

Digital Economy

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About TAFE Directors Australia

TAFE Directors Australia (TDA) welcomes the opportunity to make this submission to address the role of TAFE (and VET more broadly) in responding to the need of all Australians, as we face a future of increasing digital change and disruption, where TAFE is able to prepare the workers of tomorrow for the jobs of the future.

TDA is the peak body incorporated to represent Australia's government-owned Technical and Further Education (TAFE) institutes and university TAFE divisions, and the Australian-Pacific Technical College (APTC). TDA operates a National Secretariat in Canberra, and enjoys full membership of all TAFE Institutes in states and territories, including six dual sector universities and the eleven TAFE institutes currently registered as Higher Education Providers (HEPs).

TDA members enrolled over 800,000 students in 2016, and our institutes and the dual sector universities enjoy a majority market share of government-funded training. TAFE remains the dominant partner in vocational education for training (VET) across most of Australia's core skilled occupations, and with major Australian industry.

At a wider market level, VET is *the* major component of the tertiary education system; NCVER confirms VET enrolled three times as many students undertaking some form of accredited training as those attending universities across Australia in 2016 (4.2 million[1] compared to 1.4 million[2] respectively).

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[1] NCVER. Total VET Activity, 2016.
[2] Department of Education and Training, Student Summary 2016.

Preamble

Much has been written about the risks that digitisation and automation pose to Australia's economy and to the jobs of the future; TDA need not use this submission to address them. In short, the common thread, as far as the education sector is concerned, is that workers will need certain skills to succeed in a digital environment over the course of their careers. These skills will allow them to interact and engage with new and emerging technologies, and will give workers a value-added proposition over the technologies that risk making them obsolete.

According to the World Economic Forum, workers will increasingly need transferable employability skills across the social, information processing, and cognitive domains[3] in addition to the technical skills and the knowledge that underpins them. The OECD predicted that future economic success would be underpinned by strong mid-level technical skills. In both these cases, employers, learners, and the national economy rely on the VET sector[4].

TDA recognises that skill development cannot be done in isolation, and affirms a prominent role for employers and governments. Employers understand the current realities of their sectors and are well positioned to identify their sectors' future needs; governments are able to articulate what skills are needed for their economies to grow, and for their citizens to thrive. High quality training providers must also be included in this mix, as it is they who are able to determine how those skills can be delivered and assessed most effectively. This tripartite model, already present across many jurisdictions, must be revived in Australia[5].

TDA speaks on behalf of our members, who train the workers of today and tomorrow with the skills that they will need to succeed in their careers of choice, and that will enable employers and employees alike to compete in an increasingly competitive global economy. TDA's submission is premised on the fact that – now and in the future – every worker is a digital worker[6]

But first, what do we mean by digital skills?

It is important to make the distinction between digital qualifications and digital skills. The former are specifically in the technologies, and relate to occupations in networking, cybersecurity, programming, web development, etc. The latter, however, refers to the skills that workers will need to function effectively in a multitude of occupations. Whilst there may be sector-specific variability of these skills, both they, and much of the knowledge that underpins them, will be relatively stable across occupations.

TDA's position is that digital skills must be embedded in all educational programming, regardless of provider, field of education, and AQF level, because this reflects the new reality that technology is embedded across all occupations.

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[3] World Economic Forum (2016) The future of jobs. Employment, skills and workforce strategy for the Fourth Industrial Revolution. Global Challenge Insight Report, World Economic Forum http://www3.weforum.org/docs/WEF_Future_of_Jobs.pdf; and Deloitte. 2016. The Future of the Workforce. https://www2.deloitte.com/global/en/pages/human-capital/articles/future-of-the-workforce.html

[4] OECD. 2010. *Learning for jobs.*

[5] Deloitte, 2016. The Future of the Workforce. https://www2.deloitte.com/global/en/pages/human-capital/articles/future-of-the-workforce.html; and Wheelahan, L. 2015. The future of Australian vocational education qualifications depends on a new social settlement.

[6] Gartner, 2015. https://www.gartner.com/newsroom/id/3115717

Areas of focus

Further to the issues raised in the discussion paper, TDA would like to take this opportunity to underline the challenges our members, stakeholders, employers, and students face regarding the digital economy, both now, and in the future. Each item is raised and discussed below, along with a recommended course of action.

This section identifies some of the main issues facing TDA members and stakeholders in the VET system. The following section provides some options for governments at various levels to provide support and leadership for Australia's shift to a digital economy.

Embedding digital skills across all courses

For Australia to thrive in a digital future, we must recognise the role that technology plays in all occupations. Along this line of reasoning, it is critical to embed digital skills across all workplace roles, and, by extension, all qualifications. Whether this is to address the risk to that occupation from automation, or the way in which automation will complement human workers, and allow them to undertake more complex tasks.

Workers with the right digital skills mix, as well as those with digital qualifications will help to ensure Australian employers are able to better compete on an international stage. Moreover, workers with awareness of the technology available to them, are more likely to push their employers to adopt digital technologies. TAFE is a key player in developing these skills. It is also key to supporting SMEs to develop innovative solutions to their problems.

The question remains as to what the nature of these skills may be. How can we train workers to use technologies that have yet to be invented, or will be implemented in contexts that are vastly different from their original intent?

In our ICT quality project, TDA has identified a subset of digital skills that apply to the ICT sector; this provides a starting point[7]. The skills outlined below have been agreed by teaching faculty and validated by technology employers across Australia. There is a high degree of inter-relatedness amongst these skill domains. As such, they cannot be taken in isolation; instead they must be seen as integrated parts of a whole.

The first domain is digital literacy, where learners must be aware of emerging technologies in their field, and gain an understanding of how these might be applied. This implies that learners must be able to maintain currency in their fields, further implying that they must be prepared to be lifelong learners.

The second domain touches on how technology can complement and enhance the work learners will be undertaking. This may describe the use of technologies that will enable them to work and collaborate remotely, or technologies that will enhance the value of a physical team. However, for this skill to be truly valuable, learners also need to be able to work collaboratively in non-digital environments.

Strategic thinking complements digital literacy by helping learners reflect on the emerging technologies in their sector, and how they may be applied within an organisation. This domain, also, implies the importance of lifelong learning.

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[7] A number of the domains listed were identified by PwC Skills for Australia in their environmental scan of the ICT industry, and subsequent 4-year play, published in autumn 2016.

Creative thinking and problem solving allows learners to devise ways to apply solutions – technological or not – in the workplace. However, it also implies that learners will need maintain currency with emerging technologies in their industry.

Finally, information management[8], the ability to source relevant information using appropriate technologies. It is linked both to the ability to undertake basic research, and the ability to apply critical thinking to determine the veracity, authenticity, and/or appropriateness of the research.

Fostering (digital) entrepreneurship

TAFE helps to train tomorrow's entrepreneurs. Forty-three (43) per cent of all patent applications in Australia are by people who have a VET – usually TAFE – qualification[9]. These inventors are often owners of the small businesses that drive Australia's economy.

The Australian Government must recognise the role that TAFE plays in the applied research and innovation space, as well as the role it could play if conditions better allowed it to do so. TDA has written at great length about the value of high quality VET providers, and we underline the fact that TAFE institutes can and do act as incubators for some small businesses –by providing facilities and some of their labour force – as well as the key supporters to small businesses in need of solving applied problems. By utilising the expertise of TAFE students and faculty, businesses are able to develop solutions to their problems (and are able to keep the intellectual property); learners interact with real-world businesses and understand the real problems they face; and faculty both keep better industry currency, and build partnerships and relationships based on trust with employers in their communities, paving the way for further collaborations. Students, for their part, become part of the entrepreneurial process, and are exposed to the challenges facing real start-ups. This is one of the few instances where they can learn entrepreneurial skills while doing, all the while building a professional network that will support their success in the future.

It is of paramount importance to ensure that digital advances remain open, not one that preferences companies with the ability to pay more. This setting, referred to as 'net neutrality', has recently come up in the United States, and puts in jeopardy businesses – usually SMEs and start-ups – who do not have the ability to pay for preferential access to their services.

Bridging the Digital Divide

Referring to the haves and have nots of technology and technological skills, a digital divide risks creating a subclass of society, which is not able to participate meaningfully in the economy. Unfortunately, those most at risk of further marginalisation from the digital divide are Australians from lower socio-economic groups, and in rural and regional communities. Also at risk are displaced workers, who will need to be trained with the skills that both they and employers need.

The concept that 'all workers are digital workers' is one way of ensuring that digital skills do not translate to socio-economic stratification, and the resultant creation of a subclass without strong digital knowledge and skills. Learners in rural and regional areas, and from

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[8] Information management is the term used in the Essential Employability Skill Learning Outcomes currently in use in the Canadian province of Ontario. Its implementation, as described in this submission, is an extension of its interpretation in the original context.

[9] ABS, 2007. Australian Inventor Survey.

underprivileged socio-economic groups *must* have access to the same learning opportunities as all other Australians.

To ensure the success of those at risk from the digital divide, TDA believes that three complementary approaches should be implemented.

To address regional issues, the Commonwealth should establish a rural and regional economic development fund that centres on training and education, provides support to students (both in schools and tertiary education), allowing them to access training and employment in the region, and supports regional workforce development strategies.

The second strategy, to address skills gaps in displaced workers, is to develop a robust recognition of prior learning framework, which explicitly includes current and emerging digital skills in the labour market. This would be complemented by a framework of digital skill sets, which would allow workers who are retraining to target and build on skills specific to their former and future sectors.

The final strategy involves governments – federal, state, and local – ensure that learners have at their disposal the infrastructure needed to thrive in a digital environment. This includes adequate access both to the internet and to online materials. Secondly, it may require a further investment by government in hardware infrastructure for educational institutions, to ensure that they are able to provide learners with a learning experience equivalent to their peers in urban areas.

Applied Research and Innovation

TAFE institutes have built and nurtured relationships with a range of employers in their communities for the over 40 years of their existence, and have established a level of trust that is key to positive outcomes. With these relationships, TAFE institutes are ideally positioned to partner with these enterprises to undertake applied research that solves real-life problems, be it in technology, healthcare, administration, or any number of areas.

As government-owned entities, TAFE institutes are able to focus on priority skills and research areas that may not turn immediate profits for shareholders, but instead will improve the quality of lives in their communities, not just by solving problems, but by training workers and improving their socio-economic outcomes, and reducing their dependence on government programmes.

The potential of TAFE in this regard has not been met: Australia lags its international peers. Canada is a case in point. In Ontario, Canada's largest province, the success of the colleges of applied arts and technology in applied research has resulted from a combination of factors. The first is their mandate, through regulation, to establish close links with local employers in each programme area[10]. Furthermore, it is a core philosophy of public colleges that student involvement in applied research is an integral part of their overall learning experience.

Research funding is available to Canadian colleges through the federal National Sciences and Engineering Research Council, for projects that involve applied research and have promising commercialisation prospects. With increased trust and research activity, and stronger relationships, private investment in college research has increased substantially (59 per cent). In 2014-15, private investment made up 40 per cent of investment in college applied

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[10] Government of Ontario. 2003. Minister's Binding Policy Directive for Programs of Instruction.

research. The federal government contributed 38 per cent[11], with provincial and institutional investment making up the rest[12].

Innovation does not and cannot take place on a whim. It needs to be supported holistically, built on a strong base of human capital, and be adequately funded. It must happen where education institutes, potential workers (students), and employers come together to solve a problem. In Australia, this has been the historical realm of universities.

It is imperative that governments at all levels understand the potential benefits of TAFE as a key player in applied research and innovation. Doing so will ensure that a large part of the workforce has the preparation, training and experience to participate fully in the economy. The potential contribution that TAFE-trained workers, whether they are tradespersons, small business owners, technicians, carers, or health professionals, must be fully recognised from both a social and economic perspective.

TDA recommends that the Commonwealth, and State and Territory Governments formally recognise the role played by TAFE and TAFE graduates in applied research and innovation, and that they go on to establish a fund that directly supports applied research and innovation, with the criterion that projects will be funded only in cases where they meet industry needs.

How can governments help?

TDA views the role of government as a support and as a catalyst for action. To this end, government (at both the federal, and state and territory levels) should:

Support TAFE institutes and other educational providers to assist all Australians to gain the skills they need to operate within a digital environment.

This can be achieved by ensuring vocational education and training programmes, both initial and continuing, are funded adequately, and that providers are regulated in such a way as to support quality improvement and innovations in the areas of teaching, learning, assessment, and applied research.

Recognise and adequately fund the acquisition of generic digital skills and their underpinning knowledge in schools, VET and tertiary education, to ensure learners have the broad-based employability skills they need to thrive in a digital environment.

The first step in achieving this is to formally recognise the importance of broad-based skills for workplaces of the future, and doing so in the contexts primary, secondary, and tertiary education. This should be followed by a national discussion about the nature of these knowledge and skills, and a system of incentivising educational institutions to deliver them effectively.

Adequately fund a new wave of digital qualifications that will produce workers with the skills Australia needs to compete effectively, and to innovate in key areas.

Education providers should work collaboratively with employers and industry to develop new digital qualifications that meet the emerging digital needs of the economy. For these

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[11] CCI 2015b (p.iv)
[12] CCI 2016, p.20

qualifications to be valuable, they must be funded adequately, and it must be recognised that these may not fit the moulds of many of the qualifications currently on offer. As such, providers should be accorded a degree of operational flexibility that enables them to develop and deliver innovative programming.

Empower the business community to adopt and adapt new and emerging technologies, and provide a safe environment for them to do so.

Government should not represent a barrier to businesses, especially SMEs, from adopting new technologies. Similarly, governments must ensure that citizens have sufficient digital literacy skills that they are able to protect themselves – as much as is reasonable – from cyber threats. This constitutes one area of the digital skills for the future that are discussed above.