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Submission

by the National Centre for Vocational Education Research (NCVER)

To

Consultation paper: *The digital economy: Opening up the conversation*
Department of Industry, Innovation and Science
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The digital economy: Opening up the conversation

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SUBMISSION TO *THE DIGITAL ECONOMY: OPENING UP THE CONVERSATION* CONSULTATION PAPER

The National Centre for Vocational Education Research (NCVER) is an independent body responsible for collecting, managing, analysing, evaluating and communicating research and statistics about tertiary education and training. This submission provides statistics and research findings relevant to the Department of Industry, Innovation and Science's *The Digital Economy: Opening up the conversation* consultation paper.

This submission responds to questions 20, 21 and 22 of the consultation paper.

Question 20 What opportunities do we have to equip Australians with the skills they need for the digital economy, today's jobs, and jobs of the future?

Question 21 What opportunities do we have to bridge the 'digital divide' and make the most of the benefits that digital technologies present for social inclusion?

Question 22 What opportunities do we have to ensure digital technology has a positive impact on the cultural practices and social relationships of Australians?

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There are a range of existing opportunities to enhance Australian skills for the digital economy workforce evolution.

Rightly, section 7.4 of the consultation paper points out the opportunity that exists to sufficiently extend resource Australian education across all of schools and all post-school VET and HE spheres, because 'an educated population is the most critical infrastructure of the emerging economy'. At the economic level, research on the return on investment in VET have demonstrated the value of VET to the economy through increases in employability and, to a lesser degree, increases in productivity. Education and training have also been shown to bring other, non-financial, benefits to society such as improved health and reduced national crime and drug use (Griffin 2016). It is estimated there were 4.2 million students enrolled in VET with an Australian training provider in 2016, a 4.9% increase from an estimated 4.0 million in 2015. This reflects the participation rate of VET students in Australia as a proportion of the Australian population aged 15—64 years is estimated at 24.2%, an increase from 23.5% in 2015. Overall, there were 3.7 million program enrolments, and nationally recognised training accounted for 85.2% of all program enrolments (NCVER 2017). Students undertaking vocational education and training in schools (VETis) across the country are gaining positive employment and educational opportunities. VET in Schools (VETiS) refers to the VET undertaken by school students as part of their senior secondary certificate of education. The VET in Schools arrangement offers two main options: most students undertake VET subjects and courses as part of their school curriculum while some students undertake school-based apprenticeships and traineeships. The 2016 VET in Schools data shows that while there was a small decrease in student numbers last year, there has been a general upward trend of students over the past 20 years, with 243 300 students enrolled in 2016 compared with just 60 000 in 1996 (Misko et al. 2017). Over 17 000 students were enrolled last year as school-based apprentices and trainees, with the most popular areas of training being retail, business services and tourism and hospitality. Student numbers have also doubled over the past ten years in the areas of sport and fitness and community services (NCVER 2016).

Given that the vocational education and training (VET) sector provides students with the skills they need to get a job or change jobs, the Fourth Industrial Revolution will change VET too. This will require new thinking by governments, training providers, employers and students (Payton 2017).

The skills needed for the digital economy do include digital literacy skills. Yet the digital economy survival skills extend beyond digital literacy to the adaptability and transferability of skills. Digital literacy skills are capabilities including technical skills competencies combined with the confidence and capability to continually upgrade ICT skills due to the high turnover of ICT hardware and software change (lifelong learning). The unpredictable nature of technological innovation requires this latter adaptability skill combined with accessible, supported lifelong learning. As a result, a key requirement for equipping Australians with skills they need for adapting through the development of the ongoing digital economy jobs and into the future is enabling life-long learning. Life long learning is enabled through on-the job training development and supports for skills development when industry sectors decline in order to allow transfer and translation of capabilities to growth sectors.

Evidence for digital literacy skilling opportunities for the digital economy

Digital literacy is formed in a range of skill levels, for users and potential users of ICT in any industry setting, as well as ICT careers with some unique specificities within industry settings.

Gekara et al 2017 sampled a set of industries, and VET digital skills training content available across all occupations and levels. They point out that the *opportunity exists to*

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audit all training content to ensure digital skills training content available across all occupations and levels is the case uniformly for all industries.

They found that employer's articulate digital skills in terms of the specific tools they want the workers to use in the workplace. Their observation is that, VET training package content gives insufficient specific tools and systems content to trainees. *Opportunity exists to audit all VET training package contents to ensure industry specific tools are introduced to trainees and evidenced in their qualifications.*

Furthermore, VET training packages currently had digital training content in electives but instead these should be core units of competence to ensure all VET students gain these essential skills. *Opportunity exists to audit all VET training package contents to ensure upgrading VET qualifications to require core digital training content.*

Analysis of a sample of training packages by Gekara et al. 2017 found that the training level was limited to only basic use of ICT hardware and software for processing data and information yet there are evidenced industry demands for the higher skills (defined as including higher data analytics, cyber security, social media and mobile related digital skills). *Opportunity exists to audit training packages to require core higher skill level digital training content.*

Evidence for 'craft', creativity skills for the digital economy

The consultation paper sets out the advantages of technology and creative skills across VET (especially in STEM training settings this 'craft' competency is needed, consultation paper p 189). This is ideally for on the job but as well for other VET contexts to enable creative innovation in use of technology within all industry settings as this is central to advancing Australian industry capabilities. This can stimulate productive advancement with workers using their new skills and familiarities gained to solve production efficiency problems within their workplaces. Hodge et al 2017 show that VET can have an important role to play through the development of skills via the student-placement process — whereby VET students are placed in a host organisation to practise their newly acquired skills — and this can also contribute to innovation in the workplace. The case studies revealed examples of knowledge diffusion, and of students making small scale improvements to work practice at a local level, thus by default contributing to an increase in workplace innovation. There is little evidence existing of the extent to which this occurs in VET generally and there is an evidence gap. *Opportunity exists to audit VET training packages to ensure this 'craft' competency [consultation paper p 189] is added, ideally as a core competency across training packages.*

Beddie and Simon 2017 show that the benefits of developing an enhanced applied VET capability can stimulate Australian economic innovation, giving innovative mindsets to VET students and stronger local innovation. *They show that opportunity exists to resource through policy and funding better designs for fostering of applied VET, supporting the preparation and regular upskilling of creative workers in trades and paraprofessionals. Opportunity exists to ensure supportive VET loans/government subsidies for places are enhancing the digital economy, such as for high cost digital programs, specialist technician training at diploma level.*

Evidence for Entrepreneurial skills for the digital economy

In Australia, VET contributes to innovation in the products and processes of business and technology through the adaptive ideas and capabilities of employees (Toner 2011, Fowler 2016). Employability skills have been successfully embedded into training packages ensuring the VET role in developing these skills (Wiibrow 2011). Scott-Kemmis 2017 shows that internationally, other countries use initiatives aimed to enhance the teaching of entrepreneurship skills to VET students. Entrepreneurship skills training focuses on both basic awareness but also targeted skills and supports for those with entrepreneurial intent

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(OECD 2014), through an entrepreneurial ecosystem of resources of finance, information, knowledge. *Scott-Kemmis et al. 2017 shows there is broad opportunity to both include entrepreneurship skills training and supports across VET training packages and support professional development of these innovation and entrepreneurship skills for VET trainers (Mitchell 2007).*

Evidence for the adaptability and transferability of skills for the digital economy

Snell et al 2016:2 found that since the new emerging industries are considerably different in terms of their operations and skills needs, retrenched workers require highly transferable skills to enable them to find new work. Their analysis of the training system reveals that in its basic architecture key employability skills are embedded at the core of every qualification, enabling the system to deliver reasonably transferable skills but only within the context of similar occupations or occupational clusters.

Evidence of opportunities for better enabling worker adaptability with efficient supports and RPL

The Snell et al. 2016:3 study shows that at the point of retrenchment, the typical Australian (mature aged) retrenched worker from lower level skill occupations, as described above, does not understand the full range of the skills he/she has and, even when they do, they do not understand the extent of their transferability. They often had no formal post-school qualifications and no job search experience. They found the work of job support and training providers in the process of transition when effectively executed, could help workers identify their broad range of skills and their transferability value. An effective transition program is therefore one where adequate resources (time and funding) are dedicated to this guided process of discovery of skill sets and their demand in the market. This points to the need for improved local labour market analyses as part of worker transition programs. Both Callan & Bowman (2015) and Snell et al 2016:3 found that with greater knowledge of the local labour market conditions, career counsellors and support services staff can more accurately identify potential job opportunities or encourage retraining in growth areas. In many instances it was observed that the Recognition of Prior Learning (RPL) offered, and advice given to workers on where to attempt to obtain new employment, were not yet based on suitable regional labour market analysis. *These points show there exist a range of opportunities to enhance the support of the retrenched with transition programs involving RPL, and training of the training providers and employment facilitators for appropriate adaptability and life-long learning skills for workforces in Australia's digital economy evolution.*

Snell et al 2016:3 also point out that ultimately, workers with recognisable transferable skills have better chances at being successful in the job market after retrenchment. They found the most transferable skills for employability to be the soft/generic and non-technical skills. They found that employers failed to encourage and support their workers to develop these skills through formal accredited training (nationally recognised qualifications). *Opportunity exists to motivate and enable workers to develop their soft/generic and non-technical skills through recognized formal accredited VET training qualifications available for on the job training and other training.*

The Snell et al. 2016:1 investigation showed that of the total additional jobs created between 2006 and 2011, the greatest proportion of new jobs were at the higher skill levels (1 to 2). These findings suggest that semi-skilled and unskilled jobs across the country are not as prevalent as they once were. In this sense, Australia's job market is growing, but there is an increasing expectation that workers are more skilled than in previous years. These findings indicate that for semi-skilled and unskilled workers located in lower skill level occupations (3, 4 and 5), the challenges of finding decent and secure work are

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amplified as a general up-skilling of the economy takes place. *These results point to further opportunities to better resource and equip Australians with the skills needed for the digital economy evolution. There is the necessity for supports to enable low-semi skilled and displaced workers to up-skill in order to access new jobs. Additionally, since growing and declining occupations in some sectors are concentrated in different regions, some displaced workers may find it necessary to geographically relocate in order to find suitable employment. This adds the need to resource and support making personal decisions for physical relocation to take opportunities interstate, acknowledging that these personal decisions are never simple due to connections to community, family obligations and financial implications (see Snell, Schmitt, Glavas and Bamberry 2015). This would better enable opportunities for workers located in declining occupations to take up employment opportunities within growing occupations.*

EVIDENCE for the adaptability and transferability of skills via the VET system

In a digital economy evolution where job dislocation is prevalent, the question of whether or not the prevailing VET architecture can deliver transferable skills is pertinent. Snell et al. 2016:2 found Australia's VET system does facilitate skills transferability at both skills and unit of competency level. They also found however that transferability barriers remain from skill demand differences between occupations rather than the training system itself. The Snell et al. 2016:2 analysis shows there these barriers stemmed from the large extent of duplication of units of competency developed across more than 1,600 training package qualifications. *Two opportunities exist to improve the VET system design. The first is rationalising units of competency found in a number of qualifications which have different titles but more or less deliver the same knowledge and skills content. The second is establishing a common harmonisation of the language to describe skills and units of competency across skills councils and training packages in order to make them easier to understand across industry boundaries, educational institutions and training bodies, and among policymakers, employers and employees. Without the harmonisation of the language by which competencies are understood and described, students will remain largely unaware of the highly transferable skills they hold. Without a greater sharing of units of competency which deliver similar knowledge and skills across occupations and occupational clusters, transferable skills will remain invisible to the many workers who possess them and need to draw upon them to find alternative employment.*

Finally, young people represent the greatest part of the future workforce and productivity of this country so it is of great policy interest that young people make successful transitions from school to further education and the labour market. Stanwick et al. 2017 showed the disparity in impact of the global financial crisis (GFC), where those aged 18 at the time of the GFC had worse impact on their future outcomes, and therefore need particular policy focus in a downturn. It was also shown that young people identified as most vulnerable to poorer outcomes were those not in education or training for 6 months (NEET):

- who had a child before age 20 (particularly mothers, who had home care duties as barriers to participation), those
- with no had not completed year 12 completion, those
- with generational disadvantage (in the lowest socio-economic group, with low parental education), those
- with disability, and those
- with an Indigenous background.

Among the vulnerable include those NEET youth without a plan, the disengaged and unavailable for work, who gave reasons that they were simply not doing anything at the moment ('fixing cars with my mate'), or had barriers ('full-time carer for ill mother', 'about to have a baby'). Ryan 2011 has shown that those who do not complete year 12, but then do continue on to post-school studies, can have successful transitions from undertaking VET apprenticeship pathways (young men) or completing a traineeship (young women).

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The research found the practical learning available in these VET pathways may help re-engagment with education to make the successful transitions. Unfortunately, more recent research has found that student interest in VET-related jobs is higher than their interest in post-school VET pathways. While school students view vocational education and training (VET) as a positive experience offering practical and work-related learning, some hold negative views of the value, prestige and importance of VET study.

This demonstrates policy opportunities around better supporting youths in their post-school pathway decisions because the research shows negative perceptions of VET can strengthen in later senior secondary years, so students need access to accurate, credible information about VET pathways when they're making key decisions about their future.

VET-in-Schools programs (*VETiS)*

VET-in-Schools programs (VETiS) are not only undertaken by those students who see post-school VET as a natural pathway. In this study about a tenth of the 2006 VETiS students went on to university to get a bachelor degree. This dual function of VETiS programs in servicing the interests of students can also be highlighted for school communities. The opportunities that these programs give students to access specialised materials and equipment (for example 3D printing and other types of new manufacturing processes) can also be promoted.

The best matches in terms of intended qualifications of the VETiS program undertaken and destination occupations were for trade-specific programs. This suggests that programs that have definite structures and post-school pathways (mostly the trade-specific programs) may provide a clearer transition pathway to post-school education and training, and employment.

Information on what happens to students who undertake different fields of education can also help students explore possible pathways. Across all fields of education the majority of 2006 VETiS students were employed in 2011. The highest rates of employment for 2006 VETiS students were for those who had undertaken trade-specific studies. They were also the least likely to be among those who were unemployed and looking for work. The highest rates of NEET outcomes in 2011 were for those who had undertaken studies in the mixed field programs, the lowest proportions were for those who had undertaken studies in Engineering and Related Technologies and Architecture and Building.

There have been a range of studies including some that have compared outcomes of students that did VETiS with those who did not. These studies identified post-school employment and training and personal development benefits for those who undertook VETiS programs. Misko, Korbel & Blomberg 2017 also showed students who had undertaken VETiS qualifications went on to study at a higher level; 90% of students who had undertaken certificate I and II programs went on to study a higher qualification (at least at a certificate III level) while 43% of certificate III students and 58% of certificate IV students attained at least a diploma.

This demonstrates policy opportunities for better supporting youths in their VETiS school pathway decisions because the research shows negative perceptions of VET can strengthen in later senior secondary years, so students need access to accurate, credible information about VET pathways when they're making key decisions about their future.

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