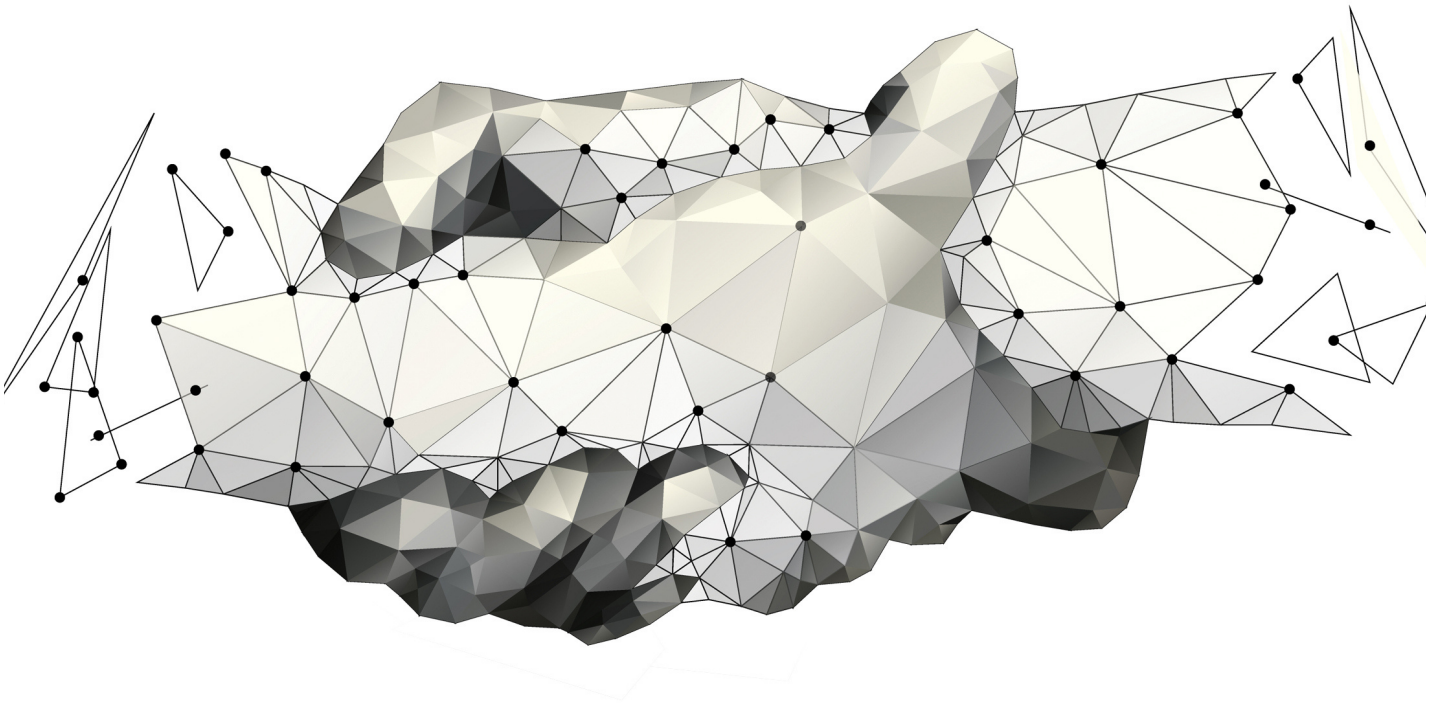
The Learning Country

DIGITAL TRANSFORMATION SKILLS STRATEGY



DIGITAL TRANSFORMATION EXPERT PANEL

The Learning Country

When Donald Horne referred to Australia as ‘a lucky country’ back in 1964, he did so with irony and to sound three warnings about Australia’s future: the challenge of our geographical position, the need for “a revolution in economic priorities” and the need for a discussion on what sort of country we wanted to become.

Digital transformation now gives us the chance to overcome many of our geographical challenges, to build a smart, sustainable and highly productive economy that's powered by innovation and entrepreneurship, and to build a more inclusive way of life.

However, whilst technology brings great opportunity, it also brings great responsibility and significant risk. With every technology-enabled step forward, workers without the requisite skills to engage in our digital future will be left behind. Without those skills and workers, we will then lose many of the advantages that technology can afford individual businesses, industries and our nation.

Digital transformation and the accelerating speed with which technology and automation will continue to evolve, mean that we must establish ourselves as a ‘learning country’. One that enables existing workers to build world class skills and knowledge throughout their working lives; regardless of geography, income, age or gender. Just as our use of technology has become the new normal, so too must our acquisition of new skills and knowledge and a culture of continuous learning.

FOREWARD

Some refer to it as *the* double disruption, the convergence of digital transformation and the global pandemic which together, have accelerated the adoption of technology at a speed none of us thought possible. In a matter of months, businesses have leapt ahead years in their digital journey. How we work, when we work and where we work are all being redefined. Such is the scale of disruption, there are few of us who remain unaffected.

History has taught us that with great economic disruption, comes the risk of great inequality if we fail to simultaneously upskill and reskill the working population. When disruption occurs at speed, as is currently the case, it significantly amplifies that risk and means that the widespread adoption of technology can come at the expense of an inclusive society. This is why our strategy has as its guiding principle that we *"leave no worker behind"*.

Digital transformation represents a rare and defining opportunity for Australia to rapidly grow its productivity. The need to rebuild our post-pandemic-economy only serves to magnify the urgency with which we need to harness its potential.

To do so, we must build a highly skilled workforce that optimises the innate human capability to learn, and is purposefully nurtured throughout our lives by governments, by industry and by us as individuals.

Australia's vocational education and training sector (VET) needs to become a dynamic and innovative learning ecosystem where businesses and existing workers readily turn to upskill and reskill as augmentation and automation continues to evolve each industry. We need to offset the barriers to learning faced by existing workers through world-class learner support services. We need to position the VET sector as a partner in Australia's innovation agenda, both as an enabler to other industries and in its own right as a world leader in using technology to enhance teaching, learning and assessment.

To help the nation's employers and its workforce understand the imperative for upskilling, we will need to leverage the unique role VET plays within society, its grassroots connection to individual workers and businesses, and its key role as part of the larger educational ecosystem. At the same time, we need to promote how VET spans all industries and all levels of our workforce.

As a Panel, we want to emphasise that whilst digital transformation may be synonymous with technology, it is those inherent human skills that cannot be replicated by an algorithm which will future proof our workforce and are now essential to build. It is why this strategy is as much about growing our cognitive skills and general capabilities as it is about digital competence.

While we have talked about lifelong learning since the Sixties, leading digital economies have it enshrined in strong policy, supported by public-private partnerships, strong connections to the innovation sector and driven through shared investment. Australia now needs brave thinking to put lifelong learning firmly in place and normalise continual skills development as a key element of business operations and our day-to-day lives. Quite literally, we must become The Learning Country.

As a multi-faceted, whole of industry strategy, no single stakeholder has the necessary resources or purview to deliver the strategy. It will take increased levels of collaboration and cooperation by governments, industry and unions to realise the profound benefits offered by digital transformation.

We want to thank the many hundreds of individuals and organisations who have shaped this strategy through their advice and passion, and without whom it would not have been possible.

We also want to thank the Australian Industry and Skills Committee for its commitment to Australia's workforce, its foresight in commissioning this work and the support of the Department of Education, Skills and Employment throughout our journey.

The Expert Panel

DIGITAL TRANSFORMATION EXPERT PANEL

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EXECUTIVE SUMMARY

In late 2019, the Australian Industry and Skills Committee (AISC) established the Digital Transformation Expert Panel to:

'... provide advice on how Australia's VET system can most effectively respond to digital change underway across industry and its impact on the nation's workforce'.

The Panel considers digital transformation to be an era-defining opportunity for our nation with the potential to bring profound benefit and economic empowerment. However, the speed and impact of digitalisation also poses significant risk and confers great responsibility on policymakers, industry and individuals to understand, prepare and act.

Australia's vocational education and training (VET) system provides a pivotal opportunity to optimise what technology offers our economy, the many industries it comprises and Australia's workforce. Importantly, the Panel also views the VET system as central to helping individual workplaces and governments mitigate the risk that it poses to the existing workforce, so that no worker is left behind.

Released in 2020, one of the most insightful and granular pieces of analysis on the impact of technology on the Australian workforce predicted that by 2034:

- Automation will displace 2.7 million Australian Workers, 56% of whom are male
- Technology will augment 4.5 million Australian workers, leading to a 15% capacity uplift to Australian businesses

We have little time to get this right. The Digital Technology Taskforce hosted in the Department of Prime Minister and Cabinet is working to ensure Australia is a leading digital economy by 2030.

Australia is currently ranked 15th in the world for digital competitiveness, 38th in the sub-factor of employee training and 40th in the sub-factor of digital/ technological skills. In 2019, 6.8% of 15-64 year old Australians participated in government funded VET.

Meanwhile, over half the world's population is connected to the internet with the world's knowledge at their fingertips and many of our international competitors are already set to 'out-skill' us as a nation.

While jobs of tomorrow will be technology-enabled, they will also be extremely human and human-centred. Existing workers will therefore need to build not just their digital competence but equally those higher-order cognitive skills and general capabilities that cannot be replicated by an algorithm and represent the ultimate in future-proofing.

The Strategy has been approached through the lens of the learning ecosystem. It comprises five Focus Areas and a series of underpinning Action Points which the Panel believes are essential to Australia's VET system being able to successfully upskill and reskill the workforce in response to the impact of digital transformation, and to position Australia as one of the world's leading digital economies.

In order, the five Focus Areas and associated goals are:

01. System settings
    - *Australia's VET policy framework and investment approach makes it attractive, affordable and easy for employers and existing workers to pursue and invest in lifelong learning*

02. Industry leadership
    - *Employers are committed to building the skills of their workforce through a culture of lifelong learning and use of Australia's VET system*

03. Learner support services
    - *Existing workers are set up for success and lifelong learning through individualised, high quality support services*

04. Teaching and learning
    - *Australian VET practitioners and Registered Training Organisations are leaders in innovation and the application of digital technology to enhance teaching, learning and assessment*

05. Training products
    - *Future-focussed, nationally endorsed training products build existing workers' agility in response to the impact of digital transformation*

The Panel believes that the practical achievement of this Strategy will require unprecedented collaboration between federal and state governments, industry, unions and the VET system. The multi-faceted nature of this Strategy suggests that there is no single 'natural' owner within the VET system – or indeed within the broader education system – as it connects issues such as, national innovation performance, workforce productivity improvement, international trade competitiveness, and taxation policy.

It should be noted that the Focus Areas and underpinning Action Points also echo several of the priorities set out in the new *Heads of Agreement* for Skills Reform and destinations in the *Draft VET Reform Roadmap*.

The following pages set out the full Focus Areas, associated goal and Action Points.

01. SYSTEM SETTINGS

Australia's VET policy framework and investment approach makes it attractive, affordable and easy for employers and existing workers to pursue and invest in lifelong learning.

ACTION POINTS

A. Establish a **comprehensive national lifelong learning policy** with a strong focus on the existing workforce, which drives coordination and collaboration across key stakeholders and features:

- Strong tripartite collaboration between governments, industry and unions
- Strong leadership at both the industry level and within the workplace
- Increased funding through a contemporary and sustainable shared investment model
- High quality, digitally enhanced teaching, learning and assessment underpinned by ongoing investment in innovation, applied research and ongoing professional development
- Strategic, industry-led design of training products and learner pathways that drive upskilling/reskilling
- Learner-focussed support services pre, during and post training
- Employer support underpinned by independent trusted intermediaries
- Performance monitoring & reporting framework with world-class targets for digital literacy and general capabilities.

B. Grow the total **investment pool** for upskilling/reskilling of the existing workforce through a contemporary and sustainable approach to shared investment, which includes:

i. Co-designing a **long-term, multi-faceted model for shared investment** (government, employer and the individual) that funds upskilling/reskilling and in recognition of its public good and commercial benefit. For example:

- enabling company and individual tax credits and incentives to be used on Nationally Recognised Training
- establishing Individual Learning Accounts to which governments, employers and individuals may contribute and use on Nationally Recognised Training.

ii. Enabling **public-private partnerships** between VET and the technology providers and manufacturers to increase the scale and impact of upskilling/reskilling initiatives throughout the VET sector.

iii. Working with industry to set **clear priorities and funding allocations for skill sets** that build on full qualifications and enable rapid upskilling/reskilling of existing workers.

iv. Building a performance monitoring & reporting framework to capture VET effort in upskilling/reskilling the existing workforce with clear targets for digital skills attainment, which incorporates:

- world-leading digital literacy targets to be achieved by 2030

- learning outcomes broken down by gender, employment sector, age and rural/regional/metropolitan location
- lead and lag indicators for digital skills adoption including credible measures of training quality
- links to the digital capability framework (Action Point I).

C. Build **whole-of-government, interconnected approaches** to upskilling/reskilling the existing workforce in line with Australia's Innovation Agenda, which includes:

i. Empowering VET to be an **active partner** of the Growth Centres, Industry 4.0 Testlabs, Cooperative Research Centres, Research and Development Corporations through:

- close working relationships with Industry Reference Committees to identify the skills/knowledge necessary for the adoption of new practices/technology in the workplace and where relevant, their incorporation in nationally endorsed qualifications and skill sets
- active engagement with VET communities of practice to build practitioners' understanding and exposure to new technologies.

ii. Piloting VET's role in assisting small to medium sized businesses to enhance their products, services and processes through **practice-based innovation and applied research** that draws on elements of the successful Canadian community college model.

02. INDUSTRY LEADERSHIP

Employers are committed to building the skills of their workforce through a culture of lifelong learning and use of Australia's VET system.

ACTION POINTS

D. Build employer and existing worker awareness of digital transformation and its impact on industry, job roles and skills through **targeted information**, which includes:

i. A **national information campaign** on the imperative, opportunities and benefits of **upskilling/reskilling and lifelong learning**. Set against the backdrop of different industries and user-tested to recognise different worker demographics, motivations and values, the campaign could be coordinated by the National Careers Institute and promoted by trusted parties such as, industry bodies, unions, community groups, service providers and governments.

ii. Development of **evidence-based, industry-specific information** on how digital transformation is evolving each industry, the jobs within it and how the VET system can be a key partner in preparing businesses and the workforce. Targeted at employees and employers, the information could be developed by Industry Reference Committees, informed by the work of the National Skills Commission and promoted by trusted intermediaries such as, industry bodies, unions, training providers and service providers.

iii. Australia-wide promotion of the **Nationally Recognised Training logo** and its meaning to help potential learners and employers make informed decisions and understand the difference and value of training products available through the VET system.

E. Establish a long-term program of **independent trusted** advisors that work with individual enterprises to drive best practice in workforce development and employee support, to identify existing worker skill needs in line with the business' digital transformation plan and to assist with navigation of the VET system.

03. LEARNER SUPPORT SERVICES

Existing workers are set up for success and lifelong learning through individualised, high quality support services.

ACTION POINTS

F. Establish a nationally agreed approach to **learner support** for existing workers that is available before, during and after training and directly tackles the barriers to successful lifelong learning. This should feature:

i. **Individualised skills assessment** to drive recognition and portability of existing worker skills

ii. **Tailored career development** support to guide learners on their options before and after training

iii. **Career information** and **learning pathway information** which is authoritative and contemporary

iv. **Financial support** in line with the principles of public good and commercial benefit

v. **Learning support** which equips all individuals with the requisite language, literacy, numeracy, digital literacy (LLND) and 'learning to learn' skills.

04. TEACHING AND LEARNING

Australian VET practitioners and Registered Training Organisations are leaders in innovation and the application of digital technology to enhance teaching, learning and assessment.

ACTION POINTS

G. Adopt and adapt the **DigCompEdu + DigCompOrg frameworks** as tools to guide and accelerate the growth of individual practitioner and RTO digital capability, in order to:

i. Strengthen the presence of digital skills within the **Training and Education Training Package** (both existing qualifications and new skill sets) and support individual practitioners through the development of a corresponding self-assessment tool.

ii. Establish a **national, long-term professional development program & communities-of-practice** to build practitioner capability in the use of digital technologies to enhance teaching, learning and assessment.

H. Enhance quality and Australia's comparative advantage in delivering education and training by establishing a collaborative, shared investment, consortia-based program at scale to drive **innovation, applied research and translation** in the use of digital technologies to enhance teaching, learning & assessment.

05. TRAINING PRODUCTS

Future-focussed, nationally endorsed training products build existing workers' agility in response to the impact of digital transformation.

ACTION POINTS

I. Develop a population inclusive, sector neutral **Digital Capability Framework** to establish a common language between the range of stakeholders, to inform training product design and support a systematic approach to skills supply and demand.

J. Develop **coherent, streamlined policy** on the inclusion of digital skills and general capabilities in training products by:

i. Establishing **nationally agreed terminology** and definitions for terms used to describe general capabilities.

ii. Developing **good practice guidance** on the use of the Australian Core Skills Framework, Core Skills for Work Framework, Digital Literacy Skills Framework and revised Australian Qualifications Framework in the design of training products.

K. Ensure the design and content of nationally endorsed **training products** supports existing workers to continuously upskill and reskill by:

i. Strategically reviewing **training packages** through the lens of digital transformation. Undertaken by each Industry Reference Committee, the review would identify how technology developments are likely to affect demand for skills, where future-focussed upskilling and reskilling pathways need to be established and how to fully optimise the recognition of portable skills.

ii. Assuring the currency of skills and knowledge in nationally endorsed training products by **fast-tracking** straightforward, industry agreed changes directly driven by new technologies.

iii. Building VET practitioners' knowledge of digital technologies by evolving the training package **Companion Volume** (non-endorsed) into an online 'live' resource that captures technologies in detail and domain.

DIGITAL TRANSFORMATION

Jobs remain the cornerstone of our economic and social lives; they give us dignity, an income and the chance to be part of something larger than ourselves. When COVID-19 hit, many businesses and workers lacked the resources or capabilities to adjust to this new, more digitally demanding world. Many workers found themselves stood down, many lost their jobs and many of us found ourselves quickly needing to learn new skills. For some it has been the first experience of formal learning since entering the workforce.

The general view is that what remerges post COVID-19 will be markedly different. Ten years of digital transformation has happened in a few months with a vast amount of economic activity shifting from the physical to the virtual world.[1] And it may not all go back. As digital technology continues to play a critical role, we can expect longer-term structural shifts. The World Economic Forum refers to the COVID-19 economic shock as 'The Great Reset'.[2]

Even before the pandemic hit, the business landscape was becoming more competitive and more volatile. In the mid-20th century, the average Fortune 500 company lasted 75 years. Today, that average is 15 years, thanks to technological disruption.[3] The rules for success have changed, and are ever more reliant on harnessing the power of digital models to create new value and experiences.

> "*The Fourth Industrial Revolution, demographic change, industrial transitions and changing consumer needs are creating demand for millions of new jobs, with vast new opportunities for fulfilling people's potential and aspirations. Yet the threat of unequal opportunity, job displacement and widening income inequality seem ever more present" [4]*

[1]Hajkowicz S1 +, Bratanova A1, Schleiger E1 and Brosnan A2. (2020) Global trade and investment megatrends: Exploring opportunities and risks for the Australian economy during and after the COVID-19 crisis with strategic foresight. CSIRO Data61, p6
[2]ibid, p9
[3] WEF (2020) Digital Transformation: Powering the Great Reset, p7
[4] WEF (2020) Jobs of Tomorrow: Mapping Opportunity in the New Economy, p6

Digitalisation is the most powerful force in our world today. It can bring profound benefits and empowerment, but only if handled with care and responsibility.[5] Academics and analysts frequently debate the likely impact of digital technologies and automation on the Australian workforce, and there is significant variation across the predictions. This can be due to factors such as the granularity of analysis (by job role, skill, task or permutation thereof), the economic composition of industries in a given country, and the existing level of automation and digital maturity of industries at the time of analysis.

Released in 2020, one of the most insightful and granular analyses into Australia's future of work predicts that, by 2034:

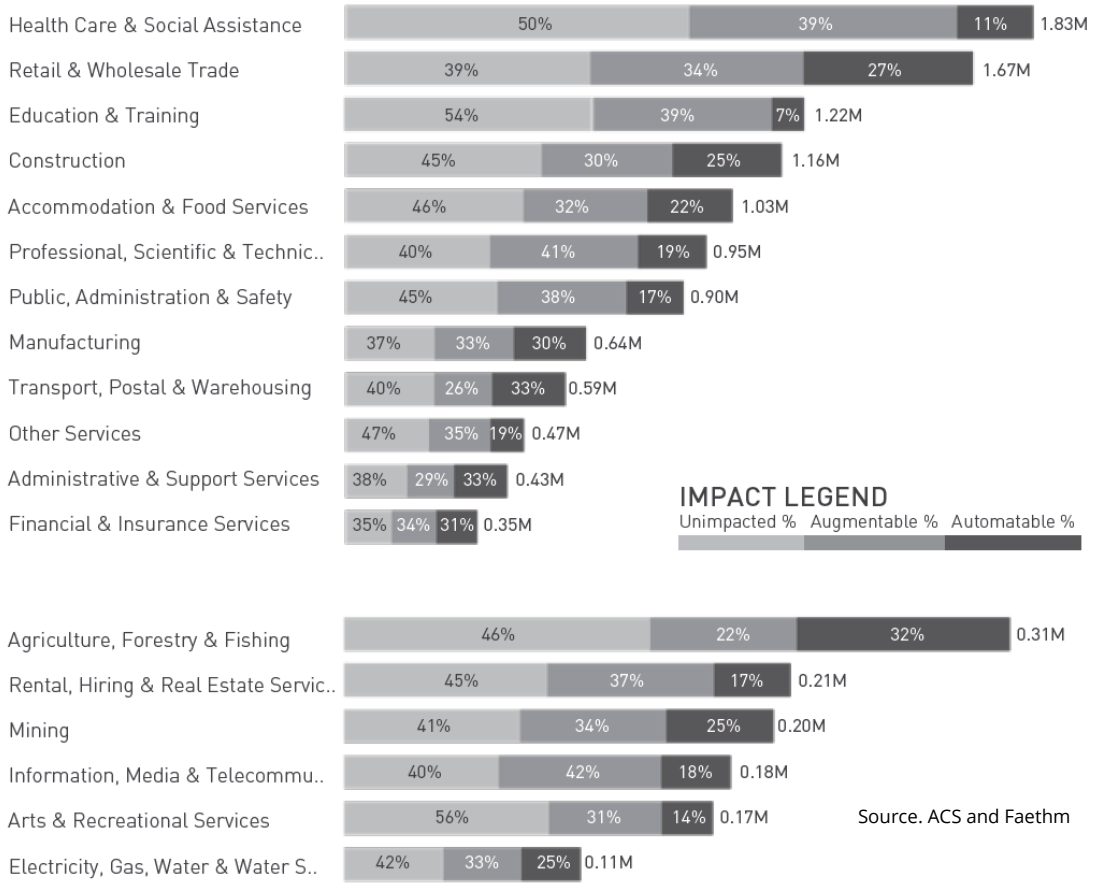
- Automation will displace 2.7 million Australian Workers, 56% of whom are male
- Technology will augment 4.5 million Australian workers, leading to a 15% capacity uplift to Australian businesses.

It suggests that '*By 2034 a labour force gap of 700k could exist while 400k people could face structural unemployment as they are unable to adapt to changing job requirements*'.[6] The nature and pace of digital transformation will vary significantly across organisations, and be influenced by their size, industry, digital maturity and capabilities (Figure 1).

Hosted in the Department of Prime Minister and Cabinet, the Digital Technology Taskforce is working to ensure Australia is a leading digital economy by 2030. The Taskforce is examining a range of issues including:

- the impact and uptake of digital technology in industry
- digital skills and inclusion
- opportunities to grow digital trade.

Figure 1 Predicted impact of technology over the next 15 years by industry



[5] WEF (2018) Our shared digital future building and inclusive, trustworthy and sustainable digital society, p5
[6] Australian Computer Society and Faethm (2020) Technology impacts on the Australian workforce, p7

Australia is currently ranked 15th in the world for digital competitiveness, 38th in the sub-factor of employee training and 40th in the sub-factor of digital/ technological skills.[7]

The skills deficit that faces our economy, the continuing march of technology and our goal to be a leading digital economy by 2030, suggest that there is significant and urgent work ahead for the vocational education and training (VET) system to drive widespread upskilling and reskilling of our existing workforce. To respond to the scale of this task, we need to reconceive our current approach to adult learning.

Jobs of tomorrow will be technology enabled, but also extremely human and human-centred. All stakeholders must understand that we therefore need to prepare the existing workforce in both technology- and human-centred imensions and that this concept needs to be central to how the VET system moves forward, both in service delivery and product design.

Human-centred skills are those that cannot readily be replicated by an algorithm. They represent the ultimate in future-proofing and ironically include skills that to date, have often been poorly valued. The development of social and emotional skills, creativity and high-level cognitive skills, are a powerful accelerator of adaptability. Workers who can combine 'human' skills like empathy, cooperation and negotiation with cognitive skills such as problem-solving, will thrive in an economy that increasingly relies on both types of skills. As individuals evolve these skills, they will continue to unlock opportunities and increase their value over the course of their working life.[8] It is why for many, if we manage this transformation well, the future of work can be more meaningful, safer and more rewarding.

This shift from hands to heads to hearts[9] reveals that men dominate the jobs susceptible to automation – manual occupations involving repetitive tasks – whilst women dominate the fastest growing jobs (such as healthcare) because they have traditionally been more the domain of women.[10]

As a nation, it is estimated that businesses and government spend $4.6 billion on training their workforces each year. They spend a further $7 billion on recruiting people with the right skills. Many of the skills being sought are those that constantly evolve and recruiting to fill shortages is an expensive solution compared to investing in upskilling the people we already have.[11]

While there are many projections on the impact of digital transformation on jobs, there are also many on how, if we get it right, it will positively impact our economy. Digital innovation can deliver Australia $315 billion in gross economic value over the next decade if we match the performance of our global peers.[12] Some estimates go further. It has also been projected that by accelerating the rate of automation and successfully transitioning all affected workers into employment, it could add up to $2.2 trillion in value to the Australian economy by 2030.[13]

In addition to the jobs and societal implications, and the considerable economic opportunities at stake, the skills that are vital to digital transformation must be neither rarefied nor static in our existing workforce. Instead, we need to normalise the notion of upskilling and reskilling to the point where it is simply part of doing business and Australia's VET system is part of that learning ecosystem.

[7] IMD (2020). World Digital Competitiveness Ranking 2020, Lausanne, Switzerland, p49
[8] Burning Glass/Business Higher Education Forum (2019) The new foundational skills of the digital economy
[9] J.Bourke, J. Mizrahi, D.Brown, D. Rumbens, L. Ryan, and X. Smith (2018) Directors' playbook: The future of work
[10] Deloitte (2019) The path to prosperity: why the future of work is human, pii
[11] ibid, p29
[12] Alphabeta and CSIRO Data61(2018) Digital Innovation: Australia's 315B opportunity, p16
[13] Google and AlphaBeta (2017) The automation advantage. p8

AUSTRALIA'S VET SYSTEM

Many that work in and around the VET system see firsthand how it can transform the lives of individuals, change the fortunes of entire families and lift the productivity of whole organisations. It is transformative and powerful, yet complex and at times, confusing.

The national VET system has a well-developed although intricate set of institutional arrangements to overcome limitations inherent to the Australian Constitution, which places formal authority for education and training with the states.[14]

As the economy evolves, the national VET system and the arrangements through which it is formed, often find themselves under pressure to be more flexible, more responsive and better meet the changing skill needs of both employers and individuals.

When rapid and far-reaching change takes hold across the economy and impacts the workforce, many of the formal arrangements that underpin the system, particularly the public VET system, will continue to be tested and policy settings reviewed and required to evolve.

THE ROLE OF VET

The VET system aims to provide people with the knowledge and skills they require to:

- enter the workforce for the first time
- re-enter the workforce after absence
- train or re-train for a new job
- upgrade their skills.

[14] Knight, K. and Mlotkowski, P. (2009) An overview of vocational education and training in Australia and its links to the labour market. NCVER, p41

Learning in general can take place at any stage in a person's life. VET on the other hand, principally relates to the working age population, typically 15–64 years.

In 2019, 6.8% of working age Australians participated in government funded VET with governments collectively expending $4.7 billion on VET delivery. Of those students who completed their training, over 65% improved their employment state and more than 88% were satisfied with the quality of their training.[15] In the same year, over 50% of employers used the system.

Stakeholders are passionate about the VET system. Consistent with feedback to the 'Joyce Review'[16] the Panel has heard strong views from industry, unions, individuals and training providers on what needs to be more efficient, better funded and more flexible. Comments are always about improvement and the Panel has sought to capture many of those views within the Strategy. Some stakeholders reflect on the simplicity of past policy settings when the national training system was being built, but overwhelmingly comments are couched with concern that in moving forward, we do not lose the core of what is ultimately the engine room for skills in our economy.

[15] NCVER (2019) Australian vocational education and training statistics: VET student outcomes 2019, p9 and p8
[16] The Honourable Steven Joyce (2019) Expert Review of Australia's VET system, p26

VET AT A GLANCE

VET STUDENTS

4.2 million

2019

VET FUNDING

$6.1 billion
government spending for VET

2019

GOVERNMENT FUNDED STUDENTS AND COURSES

1.2million
government-funded VET students or 6.8% of 15-64 year old Australians participated in government funded VET

2019

REGISTERED TRAINING ORGANISATIONS

3987 RTOs
on the national register

Dec 2020

EMPLOYERS' USE AND VIEWS OF THE VET SYSTEM

50.9%
of employers used the VET system

2019

VET STUDENT OUTCOMES

65.8%
of VET graduates improved their employment status after training

2019

VET TEACHING QUALIFICATION HELD BY TRAINERS AND ASSESSORS

Certificate IV in Training and Assessment was the highest teaching qualification for 77.1% of trainers and assessors

Feb 2019

NATIONALLY RECOGNISED TRAINING

1340 qualifications
681 accredited courses
1445 skill sets

2020

VET WORKFORCE

246 167 people employed

- 45 628 at TAFE
- 200 539 at other RTOs

71 379 or 29% of the workforce are employed as trainers and assessors

- 53.5% - permanent
- 13.9% - contract/temporary
- 32.6% - casual/sessional

Work arrangements

- 52.6% full-time
- 47.4% part-time

2019

Sources: NCVER. Understanding the Australian VET Workforce. 2020
NCVER. Latest VET Statistics. 2020

WHAT'S HAPPENING NOW

The *Heads of Agreement for Skills Reform* foreshadows the priorities of the new National Skills Agreement that will come into effect in January 2022 and has been signed by all states and territories. Its priorities include:

- 'Increasing **real investment** in VET, while undertaking agreed reforms needed to ensure this investment improves outcomes for Australians and the economy
- Providing stronger support for **foundation skills** and ensuring access for all Australians with low levels of language, literacy, numeracy and digital literacy
- Developing and funding nationally accredited micro-credentials and individual skill sets, in addition to full qualifications, and supporting **lifelong learning** through an integrated tertiary education system
- Working with the National Careers Institute (NCI), to reduce the proliferation of **careers information** available, and supporting the NCI to provide access to career information that best enables people to make decisions about their learning, training and employment pathways
- Enhancing **transparency and accountability**, through clear roles and responsibilities for governments and industry, and increasing data collection and analysis that is shared publicly to support regular assessment of governments' policies and performance.'

In recent years, several reviews have been undertaken at a national, state and territory level to strengthen the VET system.

The *Draft VET Reform Roadmap* brings the results of these reviews together in a coherent reform path for the sector as a whole. The Roadmap does not revisit or extend those reviews, or pre-empt reviews currently underway; rather, it intends to define the next steps of reform over a five-year period. It has also informed policy priorities in the Heads of Agreement for Skills Reform.

The Roadmap aims to "*position Australia's VET system as responsive, dynamic and world-leading, delivering an excellent standard of education and training and supporting millions of Australians to obtain the skills they need to participate and prosper in the modern economy.*" It sets out seven destinations:

1. 'Trusted and relevant qualifications and credentials
2. High-quality education, training, and assessment
3. Apprenticeships and employment-based training that is attractive to employers and individuals
4. All learners access and thrive in training that is right for them
5. Stronger alignment and integration between VET and higher education
6. Government VET investment supports economic and social priorities and complements the investment of industry and learners
7. National architecture and governance gives the VET system credibility, impact and stability.'

DIGITAL TRANSFORMATION SKILLS STRATEGY

The following section sets out the five Focus Areas and underpinning Action Points that form the Strategy

01 SYSTEM SETTINGS

making it attractive, affordable and easy to pursue and invest in lifelong learning

02 INDUSTRY LEADERSHIP

building a culture and commitment to lifelong learning across industry and within the workplace

03 LEARNER SUPPORT SERVICES

setting up learners for success through support pre, during and post training

04 TEACHING AND LEARNING

supporting VET practitioners and RTOs to be leaders in innovation and application of digital technologies

05 TRAINING PRODUCTS

building future-focussed, agile training products that enable existing workers to upskill and reskill

TECHNOLOGY ENABLED, HUMAN CENTRED

In late 2019, the Australian Industry and Skills Committee (AISC) established the Digital Transformation Expert Panel to:

> *'... provide advice on how Australia's VET system can most effectively respond to digital change underway across industry and its impact on the nation's workforce'.*

Conducted throughout 2020, the Panel's work and its deliberations took place against the backdrop of an unfolding pandemic, rapid technology adoption and industries seeking out new ways of working to simply survive.

For many, there will be no return to previous business models as they seek to consolidate a 'new normal'. Others will endeavour to grow, having created and captured value through new markets, products and services.

As the Panel's work progressed, the effect of the pandemic also evolved stakeholders' views on the VET sector; in particular, what its role should be, what is possible and what is needed. By the conclusion of the Panel's work, it was clear that there is now a genuine appetite for tackling some of the VET sector's biggest challenges with quite different thinking.

The Panel firmly believes that Australia's VET system is central to extracting the maximum economic value that digital transformation offers to industry and the working population. It also believes that a strong VET system is essential to ensuring that in this journey, no worker is left behind.

We have little time to get this right. Over half the world's population is connected to the internet and has growing access to the sum total of human knowledge at their fingertips.[17] Technology and its impact on the workforce will march on regardless of how prepared Australians are and many of our international competitors are already outpacing and 'out-skilling' us as a nation.

The Strategy has been shaped by the views and research of key stakeholders. It draws on the very best ideas of leading digital economies combined with insights from the Panel's own research into our existing systems and practices.

Its five Focus Areas and underpinning Action Points are interrelated and some are interdependent. Together, they aim to build the cultural and institutional change needed to continually grow the skills of our existing workforce as our world continues to rapidly change.

THE STRATEGY'S FOCUS

Early in its deliberations, the Panel chose to consider the needs of the existing workforce through the lens of the **'learning ecosystem'** and the various elements necessary to support existing workers upskill and reskill; only by understanding this environment and the barriers existing workers face, can we genuinely understand how our VET system needs to respond.

Importantly, the Panel has looked at what the VET sector needs to do to support all workers through the impact of digital transformation. Many of the workers most likely to be impacted by digital transformation are also those most likely to face barriers to training, such as fear, lack of access to information and advice, and limited time and resources. Learner support services that help address these barriers and set up learners for success long before they walk across the threshold of a training provider, are a necessary pre-condition for upskilling and reskilling the workforce through the VET system, and fundamental to this strategy.

While there is disagreement between analysts on the number of workers likely to be impacted, it is clear that Australia's current levels of investment in the formal training system will not deliver the level of skills development needed in response to digital transformation. Funding of learner support services, increasing the number of training places and establishing **lifelong learning** as a cultural norm, all mean that we need to look to identify contemporary and sustainable approaches to increasing the **investment pool**.

The need for strong **industry leadership** at both the workplace and sector level, is another pre-condition for the strategy and a recurring message from stakeholders. Normalising skill development within the workplace and ensuring it is built on good practice, requires new levels of cooperation, new ways of working together, and a grass roots understanding of how technologies are changing industries, job roles and the skills they comprise. Many employers, particularly those sitting in the latter stages of the innovation adoption curve, will need assistance to understand the imperative, the opportunities and the options for upskilling and reskilling their workforce.

Formal connection of VET with Australia's **Innovation Agenda** is long overdue. Building new skills to help businesses rapidly adopt new technologies, driving industry's exposure to new technologies and helping SMEs innovate through applied research, are all untapped opportunities for smarter use of the VET system to build Australia's digital future.

[17] WEF (2018) Our shared digital future; Building an inclusive, trustworthy and sustainable digital society, p5

Just as all other industries are undergoing digital transformation, so too is education and training. Building the **digital capability of VET practitioners** remains a key issue for the system, and a complex problem given the levels of casualisation and part-time nature of its workforce. Embracing digital technologies, such as adaptive learning platforms, will help to address some of the key barriers faced by individual workers. Technologies such as Artificial Intelligence and Extended Reality have the potential to enhance learning by immersing students in rare but critical work scenarios without the associated risk; they can help enable learners apply skills across a greater range of contexts; and by combining multiple scenarios, they can increase learners' higher-order cognitive skills which are so vital to the future of work.

Given Australia's strong track record in innovation, and that education and training is one of our top export industries, driving **innovation and applied research** in digitally-enhanced teaching, learning and assessment has the potential to make training more accessible, more relevant to a much greater pool of potential adult learners and when delivered at scale, more affordable. Collaboration and sharing of these approaches will help build the concept of seamless learning between the three education sectors that we have long sought to achieve.

In relation to training products and the skills and knowledge that existing workers need to acquire, the Panel is conscious that many stakeholders interpret 'digital transformation' as solely the need for digital skills – more of them, for everyone and at speed. There is much less understanding that digital transformation, and future-proofing our workforce, is as much if not more about building the intrinsically **human skills** that cannot be replaced by an algorithm and which will be central to the future of work for all of us. Ensuring training products capture both types of skills, and are designed to optimise career transitions through the inclusion of **upskilling and reskilling pathways**, will be fundamental to building the resilience and agility of existing workers.

STRUCTURE OF THE STRATEGY

The Strategy is shaped around Action Points in five Focus Areas:

1. System Settings
2. Industry Leadership
3. Learner Support Services
4. Teaching and Learning
5. Training Products

The following sections set out the Panel's strategy in detail. Each one explains why the Focus Area is important, provides insight into the Panel's thinking and some of the issues that have been considered, includes examples of innovative practice and 'developments to watch'.

METHODOLOGY

The work undertaken to establish the Panel's advice comprised two phases (Attachment A). Phase A focussed on research and analysis of both Australia's VET system and those of leading digital economies. It included a detailed analysis of every 2019 Industry Skills Forecast and identification of digital skills and 'soft skills' within each training package. A virtual Knowledge Platform was also established on the project website to share with stakeholders some of the leading research on the future of work. Stakeholders were also able to register for 'project updates'.

Phase B focussed on consultation and engagement with a wide range of stakeholders. It included a series of interviews with industry peaks, unions, State Training Authorities, VET regulators and provider peak body. It also involved a survey of all Industry Reference Committees (with a 95% response rate), a separate survey of industry bodies and unions, and release of a public discussion paper which sought views on the five Focus Areas. Phase B culminated in a virtual roundtable of key stakeholders to test the final draft Focus Areas and Action Points.

Strategy on a page

leave no worker behind

	1	2	3	4	5
FOCUS AREAS AND GOALS	**System Settings** Australia's VET policy framework and investment approach makes it attractive, affordable and easy for employers and existing workers to pursue and invest in lifelong learning	**Industry Leadership** Employers are committed to building the skills of their workforce through a culture of lifelong learning and use of Australia's VET system	**Learner Support Services** Existing workers are set up for success and lifelong learning through individualised, high quality support services	**Teaching and Learning** Australian VET practitioners and Registered Training Organisations are leaders in innovation and the application of digital technology to enhance teaching, learning and assessment	**Training Products** Future-focussed, nationally endorsed training products build existing workers' agility in response to the impact of digital transformation
ACTION POINTS	National lifelong learning policy with a strong focus on the existing workforce Increased investment pool for upskilling and reskilling existing workers through shared investment Active involvement of VET in the innovation agenda and the use of practice-based innovation and applied research Public private partnerships between VET and the technology sector Skill set priorities and funding to support upskilling and reskilling	National information campaign on lifelong learning National promotion of industry-specific information on digital transformation and its impact on skills and job roles National program of independent trusted advisors to build high quality workforce development within industry and help employers navigate the VET system Promotion of the National Recognised Training logo	Nationally agreed approach to learner support services pre, during and post training to drive lifelong learning: • Individualised skills assessment • Tailored career development support • Career and learning pathway information • Financial support • Learning support	Strengthened digital skills in the Training and Education Training Package National, long term professional development program and communities of practice to build VET practitioner capability in digital technologies Consortia-based program at scale to drive innovation, applied research and translation in the use of digital technologies to enhance teaching, learning & assessment	National digital capability framework Nationally agreed terminology and definitions of 'general capabilities' Best practice guidance on use of the ACSF, CSfW Framework, Digital Literacy Framework and revised AQF Strategic reviews of training packages through the lens of digital transformation Fast-tracking of changes to training packages when driven by new technologies Evolved training package Companion Volumes to identify technologies currently in use

01 SYSTEM SETTINGS

GOAL

Australia's VET policy framework and investment approach makes it attractive, affordable and easy for employers and existing workers to pursue and invest in lifelong learning

ACTION POINTS

SYSTEM SETTINGS

A. Establish a **comprehensive national lifelong learning policy** with a strong focus on the existing workforce, which drives coordination and collaboration across key stakeholders and features:

- Strong tripartite collaboration between governments, industry and unions
- Strong leadership at both the industry level and within the workplace
- Increased funding through a contemporary and sustainable shared investment model
- High quality, digitally enhanced teaching, learning and assessment underpinned by ongoing investment in innovation, applied research and ongoing professional development
- Strategic, industry-led design of training products and learner pathways that drive upskilling/reskilling
- Learner-focussed support services pre, during and post training
- Employer support underpinned by independent trusted intermediaries
- Performance monitoring & reporting framework with world-class targets for digital literacy and general capabilities.

B. Grow the total **investment pool** for upskilling/reskilling of the existing workforce through a contemporary and sustainable approach to shared investment, which includes:

i. Co-designing a **long-term, multi-faceted model for shared investment** (government, employer and the individual) that funds upskilling/reskilling and in recognition of its public good and commercial benefit. For example:

- enabling company and individual tax credits and incentives to be used on Nationally Recognised Training
- establishing Individual Learning Accounts to which governments, employers and individuals may contribute and use on Nationally Recognised Training.

ii. Enabling **public-private partnerships** between VET and technology providers and manufacturers to increase the scale and impact of upskilling/reskilling initiatives throughout the VET sector.

iii. Working with industry to set **clear priorities and funding allocations for skill sets** that build on full qualifications and enable rapid upskilling/reskilling of existing workers.

iv. Building a **performance monitoring & reporting framework** to capture VET effort in upskilling/reskilling the existing workforce with clear targets for digital skills attainment, which incorporates:

- world-leading digital literacy targets by 2030
- learning outcomes broken down by gender, employment sector, age and rural/regional/metropolitan location
- lead and lag indicators for digital skills adoption including credible measures of training quality
- links to the digital capability framework (Action Point I).

C. Build **whole-of-government, interconnected approaches** to upskilling/reskilling the existing workforce in line with Australia's Innovation Agenda, which includes:

i. Empowering VET to be an **active partner** of the Growth Centres, Industry 4.0 Testlabs, Cooperative Research Centres, Research and Development Corporations through:

- close working relationships with Industry Reference Committees to identify the skills/knowledge necessary for adoption of new practices/technology in the workplace and where relevant, their incorporation in nationally endorsed qualifications and skill sets; and
- active engagement with VET communities of practice to build practitioners' understanding and exposure to new technologies.

ii. Piloting VET's role in assisting small to medium-sized businesses to enhance their products, services and processes through **practice-based innovation and applied research** that draws on elements of the successful Canadian community college model.[18]

[18] https://tda.edu.au/wp-content/uploads/2020/10/2020-10-19-SMEs_and_TAFEs_Collaborating_Through_Applied_Research_for_Growth-003.pdf

WHY THIS MATTERS

Despite debate amongst researchers as to the extent to which automation and digitalisation will impact existing jobs globally, there is widespread agreement that:

- the increasing use of digital technology will have both job-creating and job-destroying properties, with highly routine jobs (both cognitive and manual) at greatest risk of disappearing and non-routine jobs (especially those with strong 'human skills' elements) the most likely to grow
- the scale of effort required to upskill and reskill the existing workforce in line with these job changes will be significant and will exceed current resourcing models
- the task of meeting the skill demands of digital transformation will require co-ordinated and collaborative efforts between stakeholders
- overt and coherent lifelong learning policies are needed to ensure skill development keeps pace with the rate of technological advancements.

In a bid to create a sustainable, inclusive lifelong learning model, many countries are now implementing mixed funding models based on shared investment and sharing of risk to grow the investment in vocational training. These models illustrate how Australia could grow its own investment pool to meet the increased number of training places required and the necessary support services to set learners up for success.

Several countries are also adopting formal policies that position lifelong learning as a new human right.

In Australia, there are a variety of policies that recognise the importance of growing digital skills in the workforce. However, we do not have a national policy on lifelong learning that recognises that digital transformation will be an ongoing disruptor to skills and jobs and will require a training system that is as adept at skilling the existing workforce as it is at preparing those entering it for the first time. While there are many initiatives underway through governments, industry and community organisations, they are largely uncoordinated and as a consequence, reduce their potential impact within the Australian workforce.

Our education and training systems need the capability to continuously build not only

the increasingly advanced skills needed by those working in the ICT field and occupations, but importantly, also the digital literacy skills of the entire population and the general digital skills needed to work effectively in a digital world.

Meeting the challenges of digital transformation will require more than a focus on training individuals. It will require a strategic, whole of economy approach that 'normalises' lifelong learning as an integral aspect of a successful economy. This requires the engagement of stakeholders both within and beyond the VET sector and the placing of VET more firmly within Australia's innovation agenda and activities. If Australia is to keep pace with, and harness the opportunities presented by, digital transformation, then skill development and lifelong learning considerations need to play a central role in national policy and practice as they do in other leading economies.

Efforts are being made to position Australia as a leading digital economy by 2030, respond to the impacts of COVID-19 and enhance coordination across government through the Australian Government's Digital Technology Taskforce. Building a comprehensive national lifelong learning policy and growing the total investment pool for upskilling and reskilling of the nation's workforce will greatly contribute to the achievement of these goals.

UNDERSTANDING THE ISSUES

Lifelong learning policy is becoming essential in a digital world

Internationally, driven by the rapid acceleration of digital transformation, there is a growing trend of positioning lifelong learning as a new human right. In countries such as Germany and Sweden, education and training systems are framed by concepts of equity and inclusivity that aim to ensure all citizens can be active participants in society and work. They are also underpinned by the recognition that in order to have an adequately and appropriately skilled workforce, there first must be a strong foundational skills base upon which to build.

This is particularly true of digital skills. Without widespread levels of basic digital literacy, citizens are increasingly unable to access government services or job opportunities. At the same time, workplaces need workers with the requisite digital skills to take advantage of the potential productivity increases offered by digital technology, while more advanced digital skills are needed for the growing numbers of ICT-related occupations inherent in a digital economy.

Singapore has made lifelong learning an explicit policy priority in its digital transformation agenda. Its Smart Nation policy has embedded the development of digital skills (both for its workforce and its citizens) within its core pillars. 'Manpower Development' sits alongside 'Research and Development', 'Physical and Digital Infrastructure' and 'Governance, Policies and Standards' as key enablers of their Smart Nation goals.

The prioritisation of continuous learning in these countries has meant that training to support digital transformation is not only provided, but appropriately funded and widely acknowledged as important.

Lifelong learning in Germany

Lifelong learning is a key feature of Germany's strategy for digital transformation. This is clearly articulated in the **Digital policy for Business, Work and Consumers**, which is an important operational document for the Digital Agenda. It states that:

> *Digital education and education for digitalisation need to be imparted throughout each phase of life and of education. The key term is "lifelong learning". This begins with education for young children, includes school, higher education, initial and further vocational training, and encompasses work with senior citizens. Its basis is a functioning – and also digital – infrastructure at all places of learning, primarily in (vocational) schools, yet also in companies, and not least at home. [19]*

Lifelong learning in Singapore

Lifelong learning is framed as a civic responsibility in Singapore.[20] SkillsFuture encourages Singaporeans to adopt a mindset of lifelong learning and upskilling in relation to their careers, jobs and personal lives. This is enabled through a number of measures under the SkillsFuture policy initiative, such as:

- My SkillsFuture Portal, which offers Singapore citizens and permanent residents a personalised account where they can browse and sign up for training opportunities at different levels, keep a record of their own completed training, look for jobs and find career related information
- Industry Transformation Maps, which have been developed for 23 industries under 6 clusters (manufacturing, built environment, trade & connectivity, essential domestic services, modern services and lifestyle) to support digital transformation in each industry according to whatever technological change is relevant to that sector
- Professional Conversion Programmes, which provide Professionals, Managers, Executives and Technicians (including mid-career switchers) with opportunities to "undergo skills conversion and move into new occupations or sectors that have good prospects and opportunities for progression".[21]
- TechSkills Accelerator, which supports both the existing ICT workforce and non-ICT professionals to continuously upskill in response to the continually changing demands of the digital economy. It does this by working with government agencies, employers and industries to coordinate, provide information about, deliver and certify training in the required digital skills.

[19] Federal Ministry for Economic Affairs and Energy (BMWi), Federal Ministry of Labour and Social Affairs (BMAS) and Federal Ministry of Justice and Consumer Protection (2017) Digital Policy for Business, Work and Consumers, p38

[20] Tan, C. (2017), Lifelong learning through the SkillsFuture movement in Singapore: Challenges and prospects, International Journal of Lifelong Education, 36 (3)

[21] https://www.imda.gov.sg/imtalent/programmes/pcp

In Australia, the recent review of the *Australian Qualifications Framework*, which underpins the development of qualifications across all education and training sectors, states that "*Lifelong learning must become a practical reality for people; it cannot stand as an abstract goal*".[22]

Lifelong learning is also recognised in Australia's *Draft VET Reform Roadmap*. It states that "*Meeting the life-long learning needs in the changing economy requires integrated pathways that give learners access to appropriate education and training when it's needed", and proposes that as a result of reforms, learners will "have access to education and training that meets their learning, up-skilling and re-skilling needs at all stages of their lives*".[23]

However, a scan of Australian policies conducted for the Expert Panel found that although the importance of workforce digital skills is well acknowledged by all governments, there is no specific national policy for continuing to grow the digital skills of the Australian workforce.

States and territories often have separate, and not always comparable policies that tend to focus on digital transformation from the perspective of technologies and processes and the ICT workforce. Few explicitly focus on the digital skills of the workforce as a whole or provide direction on how these skills are to be developed. Rather, the skilling component is implied through references to the need for, and importance of, digital capabilities and skills in the workforce.

Whilst some contributory policies exist, there is no comprehensive national policy on lifelong learning that can guide the ongoing journey of digital transformation for Australia's industry and workforce.

Existing funding will not be enough for the task ahead

Stakeholder consultations conducted by the Expert Panel highlighted that significant funding will be required to implement the range of actions put forward under the Strategy. Implementation of measures that increase the total investment pool for upskilling and reskilling and enable a collective approach to supporting workers at risk of disruption, will therefore be critical to the Strategy's success.

Leading digital economies are implementing novel approaches to funding upskilling and reskilling, recognising that there are elements of both public good and commercial benefit at play. Efforts to build the digital literacy of the population as a whole tend to be seen as the realm of public good and a means of ensuring inclusion and participation of citizens in life and work. However, the upskilling and reskilling of existing workers also has the potential to increase the commercial benefit to business. It can help them address their corporate responsibility to workers who are being made redundant due to automation, and possibly increase the earning potential of individuals.

While governments typically remain the major underwriter of training systems, funding of upskilling and reskilling is often supplemented by the use of shared investment approaches, which rely upon contributions by employers and individuals. Such approaches include levies, tax incentives, vouchers/individual learning accounts, loans and paid training leave.

[22] Review of the Australian Qualifications Framework Final Report 2019, p8
[23] Skills Senior Officials Network (2020) Vocational Education and Training (VET) Reform Roadmap Consultation Draft, p8

Individual Learning Accounts

A number of countries have implemented some type of individual learning account to support upskilling and reskilling. In this approach, the Government provides funds directly to individuals to contribute to the cost of training, rather than providing the funds to the training organisation or employer.

In **Singapore**, citizens and permanent residents aged 25 and over are eligible for an initial SkillsFuture Singapore Credit of $500. This amount is topped up over time depending on their cohort, current skills and training needs (including at the mid-career point).

In **France**, workers receive €500-800 in their Personal Training Accounts each year (to a lifetime limit of €5,000) to spend on training. Businesses fund the program through a 1% payroll tax.

In **Canada**, the Canada Training Benefit gives eligible workers aged 25 to 64 a $250 annual credit balance (to a lifetime limit of $5,000), to be used to refund up to half the costs of taking a course or enrolling in a training program. Workers also have access to four weeks of income support through the Employment Insurance system and leave provisions, which enable them to take study leave.

Paid training leave

Paid training leave has been put forward as a solution to address financial and time barriers for adults. However, it is recommended that "this should go hand-in-hand with other measures that increase flexibility and allow adults to fit learning into their busy schedules, such as evening and weekend provision, part-time and modular programmes and distance learning".[24]

Austria

Austria offers full-time and part-time paid training leave for eligible adults who need upskilling and reskilling as a way of compensating for forgone earnings during training periods. In the case of full-time paid leave, individuals are compensated at the level of the unemployment benefit (55% of net income, minimum EUR 14.53 per day) for a period of two to twelve months. In the case of part-time paid leave, individuals are compensated at EUR 0.82 for every hour of the number of reduced working hours, up to a maximum of EUR 492 for between four and 24 months of part-time training. [25]

[24] OECD (2019), Getting Skills Right: Engaging low-skilled adults in learning. Available online at www.oecd.org/employment/emp/engaging-low-skilled-adults-2019.pdf p17
[25] OECD (2020), Increasing Adult Learning Participation: Learning from Successful Reforms, Getting Skills Right

Belgium

Full-time – and in some cases part-time – employees have access to 125 hours of training leave per year (from 2019) to take part in training courses on in-demand skills. Employees continue to receive their wages during the leave period, up to a limit of EUR 2 871 per month. Employers can receive compensation from the regional government at EUR 21.30 per hour.[26]

Support for employers

Finland has a financial incentive that goes hand-in-hand with building the capacity of companies to identify their training needs and deliver training. The Joint Purchase Training (Yhteishankintakoulutus) supports employers who want to retrain existing staff or set-up training programmes for newly recruited staff. Offered by the Public Employment Services (PES), it supports employers to define their training needs, select the appropriate candidates for training and find an education provider to deliver the tailored training. The PES also part-finances the training, including:

- Tailored Training (TäsmäKoulutus) for employers who want to retrain their staff due to technological or other changes in the sector (min. training duration 10 days)
- Recruitment Training (RekryKoulutus) for employers who cannot find employees with the skills needed and want to hire, then train new staff (training duration 3-9 months)
- Change Training (MuutosKoulutus) for employers with staff who have become redundant, which helps them transition to other job opportunities (training duration 10 days to 2 years).[27]

Direct Government funded entitlement

From 2020, the **UK** Government is fully funding adults with no or low digital skills to undertake a range of new Essential Digital Skills qualifications (based on the national standards for essential digital skills and the essential skills digital framework).

From 2021, a suite of Digital Functional Skills qualifications will become part of this entitlement and will support learners' progression into employment or further education and development of skills for everyday life. All of the qualifications will meet new conditions and requirements set by independent exams regulator Ofqual.

Also in the UK, Government is funding the Future Digital Inclusion program, the largest program of its type which has helped over 1.3m people to develop their basic digital skills and supports some of the hardest to reach groups in society. Delivered through the 'Good Things Foundation' and working through a network of community organisations, people with low skills are a key target audience of the program.[28]

[26] OECD (2019), Getting Skills Right: Engaging low-skilled adults in learning, p18
[27] OECD (2019), Getting Skills Right: Creating responsive adult learning systems, p20
[28] https://www.gov.uk/government/news/plans-launched-to-boost-digital-skills-for-adults

Matched funding for reskilling

In 2019, the **Australian Government** introduced the 'Skills and Training Incentive' as part of the Skills Checkpoint for Older Workers Program, which assists older Australians aged 45-70 with guidance on transitioning into new career opportunities, or upskilling advice for their current roles. If eligible, Government will match the employer/individual's contribution of up to $2,200 toward suitable education and training options to reach the person's employment goals.

Public-private partnerships are also being used to great effect to aid the development of digital skills – particularly in terms of digital literacy.

The United Kingdom has developed a suite of approaches for increasing the investment in digital skills development and reducing the burden on individuals and organisations. Their 'Digital Skills Partnership' brings together public, private and charity sector organisations (including banks, ICT companies and local councils) to increase the digital capability of individuals and organisations across England. This includes free basic digital training delivered by the big ICT houses and free basic digital financial literacy through some of the big UK banks. For example:

- **Google** offered five hours of free digital skills training to every person and every small business in the UK seeking to develop their digital skills
- **Microsoft** announced plans to make free online digital literacy training available to everyone in the UK
- **Google** pledged to launch a Summer of Skills programme in coastal towns across the UK. It will develop bespoke training programmes and take Google experts to coach communities, tourist centres and hospitality businesses across the British coasts to accelerate digitisation and help boost tourism and growth in UK seaside towns
- **Lloyds Bank** has 23,000 Digital Champions currently working with digital skills charities to deliver digital skills training across the community where it is most needed
- **Barclays** runs the Digital Eagles programme to help people develop their digital skills and confidence, so they are able to fully take advantage of all things digital, including digital banking.[29]

Within Australia, individual learners and enterprises often contribute to the cost of formal training through student fees, however, lifting co-investment to the level and frequency needed to drive upskilling and reskilling of existing workers, will require system settings that make it easy, attractive and affordable. In many cases, organisations, particularly small and medium enterprises, are not aware of the imperative for, or value of, upskilling and reskilling of their workforce, which means that measures that demonstrate and promote the return on investment in training will be needed.

[29] https://www.gov.uk/government/publications/uk-digital-strategy/2-digital-skills-and-inclusion-giving-everyone-access-to-the-digital-skills-they-need

Policy settings for shared investment in the Australian context will need to make clear who selects the training – whether its employers or individuals or a collaborative decision – and ensure that the training undertaken meets defined quality standards (such as Nationally Recognised Training). The 1990 Training Guarantee had few direct precedents anywhere in the world. Over its four years, it generated between $20-100 of new industry investment in training for every Commonwealth dollar spent, however, a significant failing of the program was insufficient stipulation on what training activity funds could be expended.[30]

Particular attention also needs to be given to policies related to the use and funding of skill sets. Modular learning approaches and shorter-form credentials (such as micro-credentials and skill sets), which build upon existing qualifications or are combined with processes for recognition of prior learning, have been widely recommended in research as a means of giving adult learners greater flexibility of learning and enabling rapid upskilling in the specific skills that they lack. [31] However, proliferation of and demand for such training products in the market is far ahead of the evidence and policy underpinnings needed to ensure they are used in effective ways. The need for evidence and nationally agreed policy is urgent if these approaches to upskilling workers are to be embraced and unintended consequences of incremental learning avoided.

[30] Fraser, Doug (1996) Training guarantee: its impact and legacy 1990-1994: main report, Department of Employment. Education, Training and Youth Affairs, Canberra
[31] OECD (2019) Getting Skills Right: Future-Ready Adult Learning Systems. OECD Publishing, Paris, p42

Attention also needs to be given to monitoring the effectiveness of efforts to upskill and reskill the existing workforce. In line with the axiom that "what gets measured gets done (or managed)", the Strategy needs to be accompanied by a monitoring and reporting framework that tracks performance against targets for digital skills development. Given that publication of national training data 'lags' behind training efforts by a year or more, the use of 'lead' indicators that provide benchmarks for the likely achievement of targets will also be important.

Responses to public consultation processes suggest that performance monitoring needs to capture both broad information on uptake of training by existing workers, as well as specific information about uptake of training in relation to particular digital skills and general capabilities.

VET is missing from innovation efforts

Until recently, VET has been largely absent from the National Innovation and Science Agenda. As a result of significant lobbying, two recommendations were added to the Federal Parliament's 2017 report, *Innovation and Creativity — Inquiry into innovation and creativity: workforce for the new economy*. They were to expand the National Innovation and Science Agenda to include VET and to strengthen connections between VET and small and medium enterprises using elements of the Canadian Applied Research and Innovation Services model.

Canadian College and Community Innovation Program

The Canadian College and Community Innovation Program was first piloted in 2002 as a means of increasing the capacity of colleges to support innovation at the community and regional level. The pilot aimed to:

- increase and encourage partnerships and interactions between colleges and local industries and businesses,
- train people to have the skills required to work in local industries and business that are introducing and adapting technologies, and
- build the capacity of community colleges to enhance innovation in the local community.

The success of the pilot led to the establishment of an ongoing grants program (the Canadian College and Community Innovation Fund), which fosters community innovation by connecting the talent, facilities and capabilities of Canada's colleges and polytechnics with the research needs of local community organizations. Through collaborative and innovative research, researchers, students and partners address challenges in community innovation in the social sciences, humanities, health sciences, natural sciences and engineering research fields.[32]

Today, over 90% of colleges and institutes have applied research offices that provide their communities and local businesses with innovative solutions, including product prototypes and new products, processes or services. In 2017-18 alone, more than 4400 prototypes, products, processes and services resulted from the program, with 87% of projects completed in less than a year.

TAFE Directors Australia is now seeking to implement a similar pilot program in Australia to assist small and medium enterprises with applied research, particularly as a means of recovery from the impacts of COVID-19.[33]

Adoption of innovative practice and new technologies by any industry typically triggers the need for new skills and knowledge in the workforce. The delay or lag time in getting those skills into the workplace so that companies can optimise new technologies and lead global competitors, is where commercial advantage can be lost. Formal and closer connection of VET to the innovation sector could help quicken digital transformation within all industries by building those necessary skills as part of a planned approach to innovation and extension activities.

Tripartite commitment is needed

Strong and sustained tripartite collaboration and leadership will be critical to the successful implementation of the Strategy. Digital transformation, and the ongoing development of skills to navigate it, are long term issues. Commitment from both sides of government, industry and unions will be necessary to support the sustained effort required to see through the necessary systemic and cultural changes into the future.

Similarly, without joint effort and coordination between stakeholders, inside and outside of the VET system, many of the suggested actions will be ineffective – and just add to the proliferation of activities that are essentially trying to do the same things. Focused, coordinated action is necessary to achieve the desired impact of the proposed activities.

[32] https://www.nserc-crsng.gc.ca/Professors-Professeurs/RPP-PP/CCSIF-ICC_eng.asp
[33] TAFE Directors Australia (2020) SMEs and TAFEs collaborating through applied research for growth

DEVELOPMENTS TO WATCH

- The *Draft VET Reform Roadmap* proposes to:
  - *'Consider principles, roles and responsibilities for VET investment by governments, industry and learners'*
  - *'Commence development of a new, simpler and flexible model for national, evidence-led qualifications based around occupational clusters across the full range of the AQF framework'*
  - *'Develop an updated framework for micro-credentials in the national VET system that will facilitate recognition between the tertiary sectors'*
- The Heads of Agreement for Skills Reform foreshadows the priorities of the new National Skills Agreement that will come into effect in January 2022. In combination with the JobTrainer Fund, it forms a vital part of the national recovery efforts.
- The Australian Government is considering whether tax arrangements should play a greater role in encouraging Australians to retrain and reskill to support their future employment. It is exploring the concept of allowing individuals to deduct education and training expenses they incur, where the expense is not related to their current employment.

02 INDUSTRY LEADERSHIP

GOAL

Employers are committed to building the skills of their workforce through a culture of lifelong learning and use of Australia's VET system.

ACTION POINTS

INDUSTRY LEADERSHIP

D. Build employer and existing worker awareness of digital transformation and its impact on industry, job roles and skills through **targeted information**, which includes:

i. A **national information campaign** on the imperative, opportunities and benefits of **upskilling/reskilling and lifelong learning**. Set against the backdrop of different industries and user tested to recognise different worker demographics, motivations and values, the campaign could be coordinated by the National Careers Institute and promoted by trusted parties such as, industry bodies, unions, community groups, service providers and governments.

ii. Development of **evidence-based, industry-specific information** on how digital transformation is evolving each industry, the jobs within it and how the VET system can be a key partner in preparing businesses and the workforce. Targeted at employees and employers, the information could be developed by Industry Reference Committees, informed by the work of the National Skills Commission and promoted by trusted intermediaries such as, industry bodies, unions, training providers and service providers.

iii. Australia-wide promotion of the **Nationally Recognised Training logo** and its meaning to help potential learners and employers make informed decisions and understand the difference and value of training products available through the VET system.

E. Establish a long-term program of **independent trusted advisors** that work with individual enterprises to drive best practice in workforce development and employee support, to identify existing worker skill needs in line with the business' digital transformation plan and to assist with navigation of the VET system.

WHY THIS MATTERS

Many organisations are ill-equipped to effectively meet the challenges of digital transformation. If lifelong learning is to become a practical reality in Australia, employers will need support to understand the role and value of formal training as part of the digital transformation process, to navigate the complexities of the VET system and implement effective workforce development practices.

Research shows that industry and employers hold considerable power to positively or negatively influence existing workers to engage in upskilling and reskilling. Overwhelming feedback to the Expert Panel has stressed that without widespread industry leadership, the scale of upskilling and reskilling that is needed to meet the demands of digital transformation will not be possible.

Stakeholder feedback has also made clear that leadership is needed at both the broad industry level and within individual workplaces.

At the industry level, this requires bipartite leadership, with industry peak bodies, associations and unions working collaboratively to build awareness and positively influence workplaces and workers.

At the workplace level, it requires implementation of arrangements that support workers' engagement in learning and the creation of a culture that recognises, rewards and encourages lifelong learning.

UNDERSTANDING THE ISSUES

We need to build a culture of lifelong learning

"As adults contemplate their learning, employers can be influential advocates, or powerful opponents to their decision to pursue learning. A perceived lack of employer support or flexibility will often be the greatest barrier to learning for adults who work, as they feel unable to juggle work, life and studying responsibilities"[34]

[34] Kantar Public and Learning and Work Institute (2018) Decisions of adult learners. Department for Education, UK. p34

If employers are to embrace lifelong learning and support their workers to take up opportunities for upskilling and reskilling, they first need to understand why it matters and how it will be of benefit to them and their workforce.

Creating a culture of lifelong learning and changing thinking about the need for and value of skills development are long-term propositions.

At the same time, the COVID-19 pandemic has accelerated the rate of digital transformation in many workplaces, with employers facing the need to upskill their workforce but perhaps being unsure of how to do this. Many will be unaware of how the VET system may be able to help them.

Addressing both these shorter-term needs and longer-term culture change demands is going to require deliberate, collaborative and sustained effort across government, industry/employer bodies, unions and VET-specific stakeholders like the National Careers Institute, the National Skills Commission, the National Centre for Vocational Education Research, Registered Training Organisations and Group Training Organisations.

It will also require consideration of workforce skill demands in relation to both global drivers for change and individual business imperatives, support for employers and managers to effectively manage the change process, and development not only of the skills of workers, but also of their capability and resilience to navigate change and become lifelong learners.

Several stakeholders identified the need for public-facing, industry-specific information on the impact of digital transformation on individual job roles and skills in their industry sector. Some see it as the necessary trigger for action, particularly for those organisations that fall into the latter half of the digital technology adoption curve. Others view it as an ongoing part of an effective lifelong learning model.

The National Skills Commission has been established to give advice to the Minister on the labour market, future workforce changes and current and emerging skills needs, and is using both traditional and new data sources. Working in collaboration with the 67 Industry Reference Committees responsible for Training Packages, and the deep industry networks they possess, there is opportunity to produce the evidence-based, industry-validated insights being sought. This grass roots intelligence is particularly important if the system is to comprehensively identify emerging and future skills that are not yet captured through big data and similarly, if policymakers are to understand the underlying risks and opportunities.

A variety of other sources of information also exist that can assist with this task, such as:

- National Skills Commission labour market and workforce analysis
- Regional Australia Institute's 'Job Vulnerability Tool', which sets out the proportion of jobs at low, moderate and high risk of automation by Local Government Area.

This will require targeted communication, information and support

Consultations conducted by the Expert Panel highlighted the need for a national communication strategy on the importance of embracing lifelong learning and how to start on that journey. This requires a sophisticated approach to influencing workplace culture, with different messages

and messengers used to connect with the values and motivations of different audiences. Different information and advice will also be needed at different stages of employers' and workers' decision-making processes in relation to training.

The need for "*a national, evidence-based behaviour change campaign to change attitudes around the appropriateness and benefits of both VET and higher education to peoples' lifelong learning requirements*"[35] is also identified in the *Draft VET Reform Roadmap.*

Stakeholders emphasised that messaging needs to be anchored in a deep understanding of the different attitudes, life stages, values and behaviours across existing workers and their employers; and that this segmentation be used to carefully craft messages and test them through focus groups.

A fundamental element of this campaign would be to help employers and individuals understand the drivers and need for upskilling and reskilling and how digital transformation is likely to impact them and their industry. Stakeholders consulted during development of this strategy recommended that messaging be presented in positive ways to counteract the fear surrounding the impacts of digital transformation.

Stakeholders stressed the need for a 'single source of truth', with delivery through 'trusted intermediaries' who are engaged to relay the messaging to their particular cohort or industry as part of a coordinated and contextualised campaign. Such intermediaries were seen as being employer bodies, unions, support agencies and jurisdictional governments.

Even when employers and individuals do recognise the importance and value of training, trying to find high quality training providers and relevant training programs can be a confusing and complex process.

Respondents to consultation processes stressed that employers and employees need support to make informed decisions about upskilling and reskilling opportunities, particularly information and advice on:

- future skill demands
- the value proposition of upskilling and reskilling (not only in economic and productivity terms, but also in terms of social and cultural benefits)
- relevance of training (to both employees and their employers)
- training options and costs
- available support and incentives
- the quality of training providers.

Past workforce development programs have shown that the use of 'trusted, independent intermediaries' are an essential component of helping employers understand how to identify workforce skill needs, select the most appropriate training product and navigate the VET system to find and negotiate with the most suitable training organisation. Intermediaries are particularly valuable for those micro, small and medium sized businesses with no previous experience of workforce development or using the VET system.

However, such programs have typically been limited to budgetary periods. Whilst many of the results from these programs have been compelling, particularly those involving shared investment, the relatively narrow window for involvement makes it difficult for enterprises to plan for workforce development and for industry to drive long-term cultural change.

[35] Skills Senior Officials Network (2020) Vocational Education and Training (VET) Reform Roadmap Consultation Draft, p8

If long-term change is to be achieved, then long-term support is needed.

In addition to trusted intermediaries, the use of the Nationally Recognised Training logo could help employers and individuals to better navigate the VET system.

With a myriad of qualifications, accredited courses and non-accredited programs in the marketplace, it takes an experienced user of the VET system to discern the distinctions between and relative benefits of, different training options. The Nationally Recognised Training logo already exists for training products that have a direct relationship to an AQF qualification, unit of competency within a Training Package or VET accredited course. Active use and promotion of the logo as part of a lifelong learning information campaign could help to give employers and prospective learners greater confidence in their investment and better support the information needs of the system's users.

DEVELOPMENTS TO WATCH

The *Draft VET Reform Roadmap* proposes to:

- *deliver 'a national, evidence-based behaviour change campaign to change attitudes around the appropriateness and benefits of both VET and higher education to peoples' lifelong learning requirements'*
- *'improve national coordination of consumer information, resources and tools to support decisions on VET, pathways and career opportunities.'*

03 LEARNER SUPPORT SERVICES

GOAL

Existing workers are set up for success and lifelong learning through individualised, high quality support services

ACTION POINTS

F. Establish a nationally agreed approach to **learner support** for existing workers that is available before, during and after training and directly tackles the barriers to successful lifelong learning. This should feature:

i. **Individualised skills assessment** to drive recognition and portability of existing worker skills

ii. **Tailored career development support** to guide learners on their options before and after training

iii. **Career information** and **learning pathway information** which is authoritative and contemporary

iv. **Financial support** in line with the principles of public good and commercial benefit

v. **Learning support** which equips all individuals with the requisite language, literacy, numeracy, digital literacy (LLND) and 'learning to learn' skills.

WHY THIS MATTERS

It is widely recognised that those who do not develop the requisite digital skills and general capabilities needed to adapt to the impact of digital transformation are at risk of "unemployment, underemployment and lower-earning prospects".[36]

However, many existing workers face individual and systemic barriers to learning, stemming from personal or work circumstances, attitudes to learning, lack of information and lack of suitable learning options. Efforts to upskill and reskill existing workers in response to the impact of digital transformation will therefore be wasted if these barriers are not systematically addressed as part of a dynamic and integrated learning ecosystem.

To ensure the journey of digital transformation both strengthens a nation's economy and builds greater inclusivity of the population, leading digital economies are developing lifelong learning policies that feature a range of support mechanisms for adult learners. These supports are available not just during training, but importantly before and after training as well.

[36] Productivity Commission 2017, Upskilling and Retraining, Shifting the Dial: 5 year Productivity Review, Supporting Paper No. 8, Canberra. p2

UNDERSTANDING THE ISSUES

Existing workers face multiple barriers to learning

As the implications of digital transformation become better understood by governments and industry, the concept of lifelong learning is receiving more attention than ever before.

In a workforce context, this is typically described in terms of **upskilling** (developing additional skills to use in a current role or field) and **reskilling** (developing new skills to enable a transition to a different role or field). We will need to support those who are already in the workforce – especially those whose jobs are being significantly impacted by automation and digitalisation – to take up opportunities for upskilling and reskilling if they are to not be left behind in the years ahead.

Research is showing very clearly however, that existing workers, particularly those who are older or who have low educational attainment levels or low cognitive skills (including language, literacy and numeracy and 'learning to learn' skills), are likely to encounter barriers to engagement in training.

These barriers include:·

- **Culture of learning** – amongst both employers and employees, there are views that learning is for the young, with some believing older workers have a reduced capacity to learn
- **Motivation** – people may not even recognise the imperative for upskilling or reskilling. Research indicates that increasing adult workers' motivation to engage in training requires both intrinsic motivation (such as, sense of achievement or pleasure) and extrinsic motivation (such as, financial gain or a new job role)
- **Fear** - people may face the fear of failure, of not 'having what it takes to learn' or of having to learn alongside younger people, or fear that the time and cost involved may not be justified. Overcoming fear requires support to address both practical and emotional/psychological factors
- **Leadership** - the role and influence of the workplace on workers' engagement with upskilling and reskilling is significant and employers can impact positively or negatively on the training experience or workers' willingness and capacity to take up training opportunities
- **Resources** - time and money constraints are the most commonly cited barriers to engagement in learning for existing workers. Workers aged 25+ tend to have more commitments competing for their time, including work and family responsibilities. At the same time, traditional methods of acquiring skills and qualifications are costly and time-consuming
- **Access to information, advice and training** – internationally, there is growing recognition that access to career development support is *"an individual right linked to equal opportunities to learn and to work"*.[37] However, career development support in Australia has been described as "fragmented" and "focussed mostly on the school-to-work or further education transitions". Information about potential skilling options is predominantly aimed at young people and Australia is rated in the bottom third of OECD countries in terms of the flexibility of its adult learning system.[38]

[37] Cedefop (2019) Briefing note – Not just new jobs: Digital innovation supports careers. p4
[38] OECD (2019) Getting Skills Right: Future-Ready Adult Learning Systems. OECD Publishing, Paris. p14

Learner support is needed before, during and after training

Traditional forms of support are built into Australia's current VET system in a number of ways, such as language, literacy and numeracy (LLN) assessment and support, Recognition of Prior Learning (RPL) assessment, government-funding for particular qualifications and access to VET Student Loans. However, most of these measures are predominantly focused on supporting learners *during* training. Countries that lead the way in lifelong learning place equal effort on supporting existing workers *prior* to engaging in training and *after* completing training.

For example:

France has legislated the right of every individual to information, advice and career guidance support. Individuals can access free and personalised services that analyse existing skills and experience, develop a personalised professional plan (including recommended training) and provide support to implement the plan.[39]

Iceland has established lifelong learning centres throughout the country, which engage highly qualified guidance counsellors (typically with a diploma or master's degree in education and vocational counselling) to provide education and career counselling to adults.[40]

[39] OECD (2019), Getting Skills Right: Creating responsive adult learning systems. Available online at http://www.oecd.org/employment/emp/adult-learning-systems-2019.pdf p10
[40] OECD (2019), Getting Skills Right: Engaging low-skilled adults in learning. Available online at www.oecd.org/employment/emp/engaging-low-skilled-adults-2019.pdf, p8

- **Finland** is developing an online, virtual assistant (called Aurora) to deliver skills advice and services tailored to citizens' needs. Through Aurora, "individuals will be able to monitor the relevance of their skills, when these need updating, and receive support to apply for jobs."[41] This aspect of the platform is "aimed at keeping citizens in work during periods of labour market turmoil. It will use an algorithm to predict when users' skills are likely to become outdated and suggest routes to more sustainable employment."[42]

- **Australia** has implemented the Skills Checkpoint for Older Workers program, a free service for people aged 45-70 who are currently employed, or recently unemployed. It provides them with an individually tailored assessment of their existing skills, advice and guidance on transitioning into new roles within their current industry or pathways to a new career, development of a Career Plan, referral to relevant education and training options and access to a $2,200 Skills and Training Incentive. Existing workers also have access to Skills Match, an online interactive tool that enables workers to input the jobs they have done and see the different types of jobs and careers where those skills are transferable.

[41] NESTA (2019) Digital Frontrunners: Country Spotlights 2019. p21
[42] https://www.weforum.org/agenda/2018/06/finland-is-building-a-robot-that-will-help-you-get-a-job

Pre-training support plays a critical role in addressing several of the barriers faced by existing workers, including the less tangible but defining factors of motivation and fear. Support services at this *pre*-training/ contemplation stage include the independent assessment of existing skills (not to be confused with RPL), help with practical barriers, personal career support and identification of gap training. Support at this point also plays a critical role in helping existing workers understand how digital transformation is changing their specific industry and the implications for their own skills base and job role.

Local examples of this type of pre-training support include the Western Australian Government offering pre-training information and advice services through its TAFE-based Jobs and Skills Centres, and the Victorian Government through its TAFE-based Skills and Jobs Centres.

Supporting existing workers *post*-training is about enabling individuals to optimise their newly acquired skills in their existing job or in their new role and building on the motivation and momentum of successful learning. Far from being the final step, post-training support is actually the first step in the journey of lifelong learning. Initiatives such as South Australia's Learner Support Services are building in this type of post-training support into their VET programs.

Mechanisms such as skills passports, when authoritative and linked to authentication such as the Unique Student Identifier, can also help workers to recognise the skills they have developed and identify where they may have further skills gaps. They can be particularly helpful for employers when seeking to validate the skills held by job candidates.

South Australia – Learner Support Services[43]

To support their Upfront Assessment of Need process, the South Australian Government has introduced Learner Support Services, which are fully funded by the Department and are fee-free to students and RTOs.

Learner Support Services (LSS) provide case management support to help students address life, learning and other issues, and complete their training and transition to employment. Support includes:

- help to navigate the training system
- addressing life issues interfering with training
- addressing study skill support needs
- obtaining supports available in the community.

Learner Support Services also include Post Course Transition Support, which provides individualised support to students after the completion of their course for up to 12 weeks. This support aims to ensure a successful transition to either employment or further training.

All students accessing a subsidised training place are eligible to be offered this support, regardless of whether they have received LSS during training and regardless of whether they are experiencing any complex issues affecting their transition.

The support includes the same individualised support offered by LSS during training but focuses on working with the employer and new worker or with the exiting student and their next training provider.

[43] https://providers.skills.sa.gov.au/Deliver/Learner-support-services

Recent Australian and international research identifies seven types of support needed to address the barriers that adults face to upskilling and reskilling (see Table 1).

DEVELOPMENTS TO WATCH

The *Draft VET Reform Roadmap* proposes to:

- deliver *'a national, evidence-based behaviour change campaign to change attitudes around the appropriateness and benefits of both VET and higher education to peoples' lifelong learning requirements'*
- *'improve national coordination of consumer information, resources and tools to support decisions on VET, pathways and career opportunities.'*

Table 1. Types of support to address barriers to upskilling and reskilling

Types of support	What this might look like	When this type of support is needed		
		Pre-training	During training	Post-training
Financial support	For example, loans and subsidies for course fees, support to cover student fees, books and materials, travel or childcare costs, paid training leave or tax incentives		✓	
Learning support	For example, foundation skills and learning skills support, assistive technology and mentoring and support to address personal circumstances	✓	✓	
Workplace support	For example, increasing the availability of training opportunities and highlighting the value of training for workers, providing flexible working arrangements, recognising soft skills in recruitment and performance management processes	✓	✓	✓
Individual career development	For example, making individual career education and career advice services available to adults at any point in their working life (especially for those whose jobs are at risk), and promoting the value of adults having the skills to reflect on and manage their own career and learning paths	✓		✓
Career and training information	For example, providing information about career and training pathways in formats suitable for existing workers, and providing the right kind of information at different stages in the decision-making process, including information that challenges mindsets about lifelong learning	✓	✓	✓
Skills assessment (including Recognition of Prior Learning)	For example, provision of quality RPL services and other skills assessment services that enable adults to reflect on and identify their capabilities, promote their skills and competences, identify areas for further training and match their capabilities with labour market needs	✓		
Flexible training options that suit the needs of existing worker learners	For example, provision of training options that are suited to the needs of adults with work and home commitments, use of micro-learning and credentialing, and use of digital technology to enhance the flexibility and effectiveness of training for adult learners		✓	

04 TEACHING AND LEARNING

GOAL

Australian VET practitioners and Registered Training Organisations are leaders in innovation and the application of digital technology to enhance teaching, learning and assessment

ACTION POINTS

TEACHING AND LEARNING

G. Adopt and adapt the **DigCompEdu + DigCompOrg** frameworks as tools to guide and accelerate the growth of individual practitioner and RTO digital capability, in order to:

i. Strengthen the presence of digital skills within the T**raining and Education Training Package** (both existing qualifications and new skill sets) and support individual practitioners through the development of a corresponding self-assessment tool.

ii. Establish a **national, long-term professional development program & communities-of-practice** to build practitioner capability in the use of digital technologies to enhance teaching, learning and assessment.

H. Enhance quality and Australia's comparative advantage in delivering education and training by establishing a collaborative, shared investment, consortia-based program at scale to drive **innovation, applied research and translation** in the use of digital technologies to enhance teaching, learning & assessment.

WHY THIS MATTERS

While technology-assisted learning has been a feature of the tertiary education landscape for many years, COVID-19 restrictions on physical gathering and movement have triggered a rapid system-wide shift to online learning.

New and emerging technologies such as Extended Reality and Artificial Intelligence are also taking the concept of what is possible through online learning to new levels, as well as enhancing the delivery of face-to-face learning.

These technologies present Australia's VET system with a defining opportunity to rethink the way it offers training to the working population. Existing workers are much more likely to struggle with competing demands on their time and need more flexible and tailored learning options than those studying full-time. Digital technology offers the potential to make training more accessible, more relevant to a much greater pool of potential adult learners and when delivered at scale, more affordable.

Taking advantage of new technologies in teaching, learning and assessment will require sustained capability-building of both individual VET practitioners and training organisations. However, it has been well over a decade since our last national program of professional development for VET practitioners and many trainers and assessors are casual.

Dedicated, long-term investment in innovation and applied research is also needed to determine which types of applications offer the greatest benefit and return on investment for education and training. This research and innovation will rely on collaboration, not just with the private sector, but with schools and higher education providers so that technology can finally help make seamless learning a reality as prioritised in the new Heads of Agreement for Skills Reform.

Significant upskilling of the nation's workforce is one of the most powerful levers we have at hand to boost productivity, grow our economy and limit the risk of unemployment scarring. When added to the fact that education and training is Australia's fourth largest export industry[44], the business case for building our VET workforce as leaders in the innovation and application of digital technology is compelling.[45]

UNDERSTANDING THE ISSUES

Digital technology can enhance teaching, learning and assessment

Digital technologies are already being used across the world to make teaching, learning and assessment more effective, and further applications continue to be developed. Amongst its many current uses are:

- providing more flexible learning options for learners with existing work and other commitments
- improving student engagement through more interactive learning experiences and workplace simulations
- increasing access to learning resources
- removing geographic and travel barriers and allowing subject-matter experts to contribute from anywhere in the world
- facilitating self-paced and customised learning opportunities
- enabling trainers to better gauge student progress and adjust training accordingly
- providing a safe environment for learners to make mistakes and develop their skills before applying them in a live environment
- identifying the need for and providing wrap-around support for learners.

[44] Hajkowicz S, Bratanova A, Schleiger E and Brosnan A. (2020) Global trade and investment megatrends: Exploring opportunities and risks for the Australian economy during and after the COVID-19 crisis with strategic foresight. CSIRO Data61. Brisbane, Australia
[45] Department of the Prime Minister and Cabinet (2020) Heads of Agreement for Skills Reform. Canberra, ACT

The digital technologies that are driving this transformation of education and training include Extended Reality (the overarching term used to describe technologies that enhance senses, such as Virtual Reality, Augmented Reality and Mixed Reality), Artificial Intelligence, computer animations, gamification and online learning platforms.

Virtual Reality (VR) technology is an immersive experience that shuts out the real world and allows users to not only see, but also interact with the virtual world. It is already being used widely in education and training overseas. For example, the US Airforce uses VR as a low-cost alternative to the use of flight simulators. Aircraft manufacturers use VR to enable trainee aircraft technicians to see inside aircraft systems that are not easily accessed. Universities give anatomy students the opportunity to dissect parts of the body using digital cadavers and ophthalmology students the chance to practice cataract surgery on virtual patients. Schools are conducting virtual field trips to far-away places and vocational students are practising skills using VR simulated environments. In the construction industry, VR is being used for architecture and design visualisation, construction health and safety training, equipment and operational task training, and structural analysis[46].

Augmented Reality (AR) technology overlays 3D images, videos and graphics onto a live image (the game Pokemon Go is an example of AR). Its applications in education and training are less developed than for VR, but it also offers potential for enhanced teaching and learning. For example, Microsoft's Hololens 2 device (which uses a pair of goggles) is being trialled for training aircraft technicians in various components and systems. In the health field, nursing students are using an application that helps them to visualise Add a little bit of bodwounds and health problems with the help of mannequins, smartphones, and QR codes, while anatomy and pharmacology students are being taught complex concepts using headsets that display Mixed Reality holograms (using a combination of VR and AR technologies).

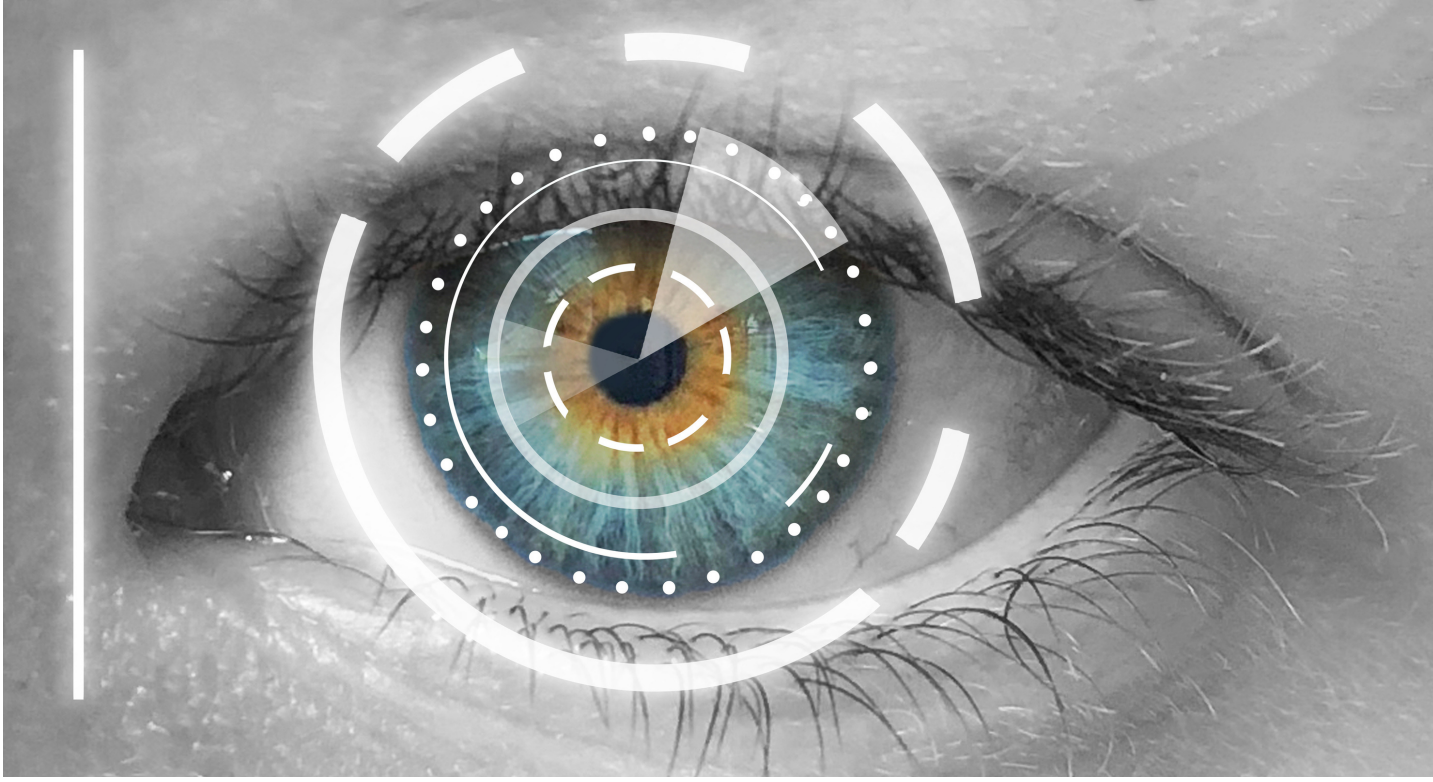
There is also potential for AR to be used for assessment purposes as AR oggles/headsets have the ability to track how someone completes a task and provide a report back to the trainer. This type of application is being trialled in the UK, with medical students being assessed using AR headsets that show a hologram of human anatomy.

Both VR and AR technology are useful for showing students components, systems and concepts that are complex, or that are normally difficult to access or see. They also enable individual learners to practise and develop their skills in a controlled, risk-free environment and for educators and trainers to set up lifelike situations for learners to respond to, which they otherwise may rarely have the opportunity to experience in real life.

Artificial Intelligence (AI) or machine intelligence and machine learning has applications in adaptive and personalised learning. It uses computer algorithms that interact with learners to customise learning resources and activities based on their ability, preferred mode of learning, and experience. This type of technology is already being used in online education and training courses.

AI also has applications in grading assessments, monitoring student progress and alerting trainers/tutors when they appear to be struggling, providing virtual tutors that can answer student questions and developing 'smart content' for education and training programs.

[46] Wang, P. and Wu, P. and Wang, J. and Chi, H. and Wang, X. (2018) A Critical Review of the Use of Virtual Reality in Construction Engineering Education and Training. International Journal of Environmental Research and Public Health. 15 (6)



Digital technology is being used in education and training to make learning more engaging. For example, **computer-based animations** are being used to illustrate concepts and '**gamification**' is being used to enhance knowledge and build technical skills and soft skills such as problem-solving. Gaming technology is also being used in the career development sector to help young people learn about occupations and education and training options through the use of occupational simulation and role playing.

Games can register gamer behaviour, adapt gaming conditions and provide information to be used by practitioners to complement assessments and to provide feedback.[47] Aspects of gaming technology, such as facial recognition, can also be of use in the identification of online assessment candidates.

Online learning platforms have been in use for a long time but are now receiving significant attention due to their potential to provide more flexible learning options for adult learners.

Learning can be completely online, such as in Massive Open Online Courses (MOOCs), which learners can freely access, with the option to pay for credentialing if required. Alternatively, it can be provided through blended learning, which combines electronic resources with direct interaction between the learner and teacher/trainer/tutor.

A recent review of the use of online learning in Australian VET found that online learning platforms were being used to:

- provide course material (in the form of text, videos and links to external material)
- facilitate engagement among students and between students and the trainer (for example, through webinars and online video-conferencing)
- enable one-on-one communication between the students and the trainer
- conduct assessment.[48]

Adaptive learning platforms, which draw on machine learning and AI, can identify and adapt to an individual's optimum learning style and help to help overcome many of the practical and motivational problems experienced by existing workers.

[47] Cedefop (2019) Briefing Note - Not Just New Jobs: Digital Innovation Supports Careers, Cedefop, Thessaloniki. p3
[48] Griffin, T and Mihelic, M (2019) Online delivery of VET qualifications: current use and outcomes, NCVER, Adelaide. p20

The above examples highlight that the use of digital technology in education and training does not simply mean 'doing online learning'. Digital technology offers a widerange of uses that could potentially make VET more attractive, accessible, engaging and effective for the nation's workforce. However, for this to be a reality, technology-enhanced teaching, learning and assessment needs to be done well.

We need to build practitioner and RTO capability

Trainers and training organisations need to not only understand and train learners in the necessary digital skills and general capabilities for their vocational area of expertise, but increasingly, to be able to design digital learning content, curate learning resources, and facilitate learning and conduct assessment using the digital technologies.

While not all VET practitioners will be required to be digital experts, a minimum level of digital competence will be required as learners themselves bring with them ever-increasing levels of digital literacy and expectations of use of current technology in education and training. Ongoing professional development in digital skills will be an inevitable necessity for the vast majority of VET practitioners, but it has been over a decade since a large-scale, national professional development program existed for the sector and VET has yet to enjoy the equivalent of a national centre of excellence for VET practitioners.

The 2019 Education Industry Skills Forecast highlights the need for VET practitioners "to be digitally literate so that they can practically facilitate digital learning, but also that they understand e-learning pedagogy so as to appropriately employ digital learning strategies". It describes these capabilities in terms of:

- "digital fluency and strategies for continuous learning to maintain digital currency
- numeracy and computational skills of VET trainers and assessors, as these skills provide a foundation for the attainment of digital fluency and other STEM skills
- the ability to deliver materials through e-learning and to assess online learning, including the ability to make resources and assessments available online, deliver training sessions online and facilitate a collaborative online learning environment
- the ability to teach basic digital skills as a part of industry-specific training".[49]

The *Standards for Registered Training Organisations (RTOs) 2015* and the Certificate IV in Training and Assessment work together to set the minimum requirements for individual practitioner capability and vocational currency. Currently though, there is no underpinning framework to help VET practitioners identify and build the necessary digital capabilities for an educational context.

The European Union has developed a Framework for the *Digital Competence of Educators (DigCompEdu)* and a *Framework for Digitally-Competent Educational Organisations (DigCompOrg)* to complement the implementation of its *Digital Competence Framework for Citizens (DigComp 2.1)*. Adopted and adapted by several countries, they emphasise the need for leadership of the training organisation in partnership with and support of the individual practitioner.

[49] PWC's Skills for Australia (2019) Industry Skills Forecast and Proposed Schedule of Work – Education, PricewaterhouseCoopers Data and Analytics Services Pty Limited. p18

DigCompEdu recognises that educators will need competence in six key areas:

1. **Professional Engagement** - which relates to educators' use of digital technologies in professional interactions with colleagues, learners, parents and other interested parties, as well as for their own individual professional development and within the organisation
2. **Digital Resources** – which includes the competences needed to select, create, modify, manage, protect and share digital resources for learning
3. **Teaching and Learning** – which acknowledges the potential of digital technologies to shift the focus of teaching processes from teacher-led to learner-centred. It covers competences for managing and orchestrating the use of digital technologies in teaching and learning, including use of digital technologies to foster collaborative learning and self-regulated learning
4. **Assessment** – which addresses the use of digital strategies to enhance assessment, and recognises the potential of digital technologies to better 1. understand learner behaviour, monitor learner progress and facilitate feedback and planning
5. **Empowering Learners** – which focuses on the potential of digital technologies to support learner-centred teaching and learning strategies. This includes improving accessibility and inclusion for all learners (including those with special needs), as well as using digital technologies to differentiate and personalise learning and foster active engagement with a subject matter, including real-world contexts
6. **Facilitating Learners' digital competence** – which includes the competences needed by educators to enable their students to develop the skills covered by the European Digital Competence Framework for Citizens (i.e. information and media literacy, digital communication and collaboration, digital content creation, response use, digital problem solving).[50]

The **DigCompOrg** framework has been designed "(i) to encourage self-reflection and self-assessment within educational organisations as they progressively deepen their engagement with digital learning and pedagogies (ii) to enable policy makers (at local, regional, national and international level) to design, implement and appraise programmes, projects and policy interventions for the integration of digital learning technologies in E&T systems."[51]

It provides guidance and descriptors of good practice across 15 sub-elements of the pedagogical, technological and organisational dimensions of education and training.

Resources developed from the DigCompEdu framework

The DigCompEdu framework has been used as the basis for development of a 'self-reflection' tool. Still under testing, it is currently open to educators worldwide with feedback welcomed (Dec 2020).

Developed by the UK's Training and Education Foundation and mapped to DigCompEdu, the Digital Teaching Professional Framework is a competency framework for practitioners and part of the strategy to transform the country's Further Education and Training sector.

[50] Redecker, C. (2017) Framework for the Digital Competence of Educators: DigCompEdu. Publications Office of the European Union, Luxembourg.
[51] https://ec.europa.eu/jrc/en/digcomporg/framework

These frameworks could provide a useful basis for the ongoing development of Australian VET practitioners and RTOs, including as a basis for tools to self-assess current capabilities and plan capability building activities. However, a challenge for our VET sector will be to find ways in which to effectively upskill the whole of the VET workforce.

Access to professional development of VET practitioners has often been limited for non-permanent workers in the sector. With casual trainers and assessors making up a significant proportion of the workforce, this is a significant issue to address.

In addition, research conducted into online learning in VET found that "the majority of teachers who participated in their study were seen to require considerable professional development to enable them to respond better to the increased use of online learning. Some teachers held the opinion that they were 'too old' to learn and they lacked confidence, which inhibited their capacity to reconceptualise how they teach their subjects and re-create content."[53]

In the same way that digital technology may assist in the development of training solutions that meet the learning needs of existing workers, technology-based initiatives may also assist in developing professional development solutions that can cater for the whole VET workforce.

We also need to build capacity

The case for building the capability of those who work in the VET sector is clear. However, we also need to build capacity of the VET sector to adopt digital technologies and, perhaps more importantly, to understand which technologies are of greatest benefit in enhancing teaching, learning and assessment and what types of applications are most suitable for different contexts.

Those involved in consultations conducted by the Expert Panel cautioned against assuming that VET learners want to learn through digital platforms or that individuals and RTOs have access to the digital infrastructure required to access or implement technology-enhanced teaching and learning.

In addition, it is widely recognised that harnessing technology can be expensive – not only the initial investment, but also the cost of ongoing maintenance and updates and the upskilling of practitioners to use it. Use of technology for teaching and learning can also be hampered by software and hardware limitations, lack of access to reliable internet connections and concerns about quality and validity of online learning and assessment activities.

Australia's VET Workforce

In February 2019, Australia's VET workforce comprised:

- 246,167 people were employed in the VET workforce
- 29% or 71,379 people in the VET workforce were employed as trainers and assessors

Of people employed as trainers and assessors, 53.5% were employed on a permanent basis, 13.9% on a contract or in temporary positions, and 32.6% on a casual or sessional basis.[52]

[52] Griffin, T and Mihelic, M (2019) Online delivery of VET qualifications: current use and outcomes, NCVER, Adelaide. p54
[53] Knight, G., White, I. and Granfield, P. (2020) Understanding the Australian Vocational Education and Training workforce, NCVER, Adelaide. p15

Currently, there is little publicly available research on the types of technology that offer the greatest potential for enhancing learning and assessment in vocational training settings, or on the cost-benefit of implementation of particular types of digital technology. Given the significant costs of investing in new technology, the business case for doing so needs to be clear and compelling.

Digital capability frameworks for VET practitioners and providers, underpinned by strong professional development are a critical step in guiding and lifting digital capability of the VET workforce. However, to derive real value and momentum for change, this needs to be accompanied by a dedicated and long-term program of innovation and applied research that builds the capacity of the VET sector to implement technology-enhanced teaching, learning and assessment solutions.

Unlike many industries that are central to the economy and where new technologies are transforming their core business (e.g. manufacturing, health, agriculture), there is no nationally focussed applied research and innovation program that can help drive the digital transformation of VET in Australia.

Cooperative Research Centres (Aus), Fraunhofer Institutes (Germany) and Catapult Centres (UK) all offer examples of shared investment-type models for building capacity, which could be viable in Australia with the right settings.
The value of such an approach would rely on extension and adoption activities so that the Australian VET sector benefits as a whole and passes on those benefits to individual leaners and their workplaces.
 Collaborating and sharing new practices and technologies with the higher education and school sectors could also help build the seamless learning pathways we have long sought to make a reality.

DEVELOPMENTS TO WATCH

- The *Draft VET Reform Roadmap* proposes to:
  - *"Develop a VET workforce quality strategy based on leading international practice and considers capability frameworks, current pre-service requirements, continuing professional development"*
  - *"Develop new RTO Standards and arrangements to support continuous improvement of RTO training delivery"*
- The recent *Expert Review of Australia's VET System* called for "*targeted measures to encourage and highlight best practice for VET trainers*", along with a new vision and strategy that positions VET as "*a modern, fast-paced alternative to classroom-based education", with a "reputation as a trusted, dynamic and adaptive sector that can deliver Australia's skills needs, now and in the future*".[54]
- The national VET regulator, the Australian Skills Quality Authority, is undertaking a strategic review of online learning in the VET sector to understand the risks and opportunities so that regulatory approaches are effective and quality remains at a high standard.
- The 'Train 100 Data Analysts' project is an initiative of the Digital Skills Organisation pilot and the first in a series of projects designed to fund, test and evaluate improved ways of training people in digital skills to get people into digital jobs, and help close Australia's digital skills gap. Indigenous Australians, mature-aged and young people will be among those to be trained and employed as part of the project.
- The Deliver E-Learning Skill Set comprising two existing units of competency from the Training and Education Training Package is now available to upskill VET practitioners in: designing and developing e-learning resources; and facilitating e-learning.

[54] Commonwealth of Australia, Department of the Prime Minister and Cabinet (2019) Strengthening Skills: Expert Review of Australia's Vocational Education and Training System, p50

05 TRAINING PRODUCTS

GOAL

Future-focussed, nationally endorsed training products build existing workers' agility in response to the impact of digital transformation

ACTION POINTS

TRAINING PRODUCTS

I. Develop a population inclusive, sector neutral **Digital Capability Framework** to establish a common language between the range of stakeholders, to inform training product design and support a systematic approach to skills supply and demand.

J. Develop **coherent, streamlined policy** on the inclusion of digital skills and general capabilities in training products by:

i. Establishing **nationally agreed terminology and definitions** for terms used to describe general capabilities.

ii. Developing **good practice guidance** on the use of the Australian Core Skills Framework, Core Skills for Work Framework, Digital Literacy Skills Framework and revised Australian Qualifications Framework in the design of training products.

K. Ensure the design and content of nationally endorsed **training products** supports existing workers to continuously upskill and reskill by:

i. Strategically reviewing **training packages** through the lens of digital transformation. Undertaken by each Industry Reference Committee, the review would identify how technology developments are likely to affect demand for skills, where future-focussed upskilling and reskilling pathways need to be established and how to fully optimise the recognition of portable skills.

ii. Assuring the currency of skills and knowledge in nationally endorsed training products by **fast-tracking** straightforward, industry agreed changes directly driven by new technologies.

iii. Building VET practitioners' knowledge of digital technologies by evolving the training package **Companion Volume** (non-endorsed) into an online 'live' resource that captures technologies in detail and domain.

WHY THIS MATTERS

It is not only digital skills that are in demand.

Analysis of job trends is showing that alongside the disappearance of routine, manual jobs, "two-thirds of jobs will be soft-skill intensive by 2030". These 'human skills' are also the ones most often missing in the current workforce.[55]

So, the accelerating demand for digital skills is being accompanied by an equally accelerating demand for the types of 'human skills' variously described as *generic skills, core skills, foundation skills, soft skills, employability skills and general capabilities* (for the purposes of this strategy, the panel has adopted the term 'general capabilities' as this is the terminology that will be used in the soon to be revised Australian Qualifications Framework, which underpins the design of education and training qualifications in Australia).

Whilst digital skills and general capabilities are broadly captured in the qualifications and skill sets used by the VET system, digital transformation is significantly elevating the importance of both types of skills and increasing the demand for higher level cognitive skills. There is growing pressure for these skills to be made more explicit, current and relevant in training products and for the relationships between these skills to be made clearer.

Stakeholders also question the capacity of VET to readily upskill or reskill existing workers given it is a system with its genesis in entry level training and its funding models and training products are often centred on the needs of those seeking to enter the workforce, rather than those already in it. Certainly, there has been a rapid proliferation of micro-credentials, many of which focus on digital skills and the concept of upskilling, however the market has run ahead of nationally agreed policy to underpin their design and recognition and to manage any unintended consequences of incremental learning.

Given the increasing risk that without the requisite skills to engage in a digital future, workers will be left behind, the need for timely and strategically designed training products for both upskilling and reskilling existing workers becomes critical.

[55] Deloitte (2019) The path to prosperity: Why the future of work is human, Deloitte Touche Tohmatsu. pii-iii

UNDERSTANDING THE ISSUES

We need greater cohesion around digital skills development

Digital skills for Australia's workforce are already being developed by the VET system through the medium of Training Package qualifications, skill sets and accredited courses. The recent *Australian Qualifications Framework review* also paves the way for an increased focus on micro-credentials, which are likely to be an important vehicle for training existing workers, building upon entry-level qualifications.

Outside of the VET system, digital skills are also being developed through avenues such as adult and community education training, vendor certification training provided by software and hardware developers and a range of free online training options through platforms such as, Google Digital Garage, LinkedIn Learning and Microsoft Learn.

Currently though, there is no nationally agreed approach to the development of digital skills to underpin these efforts, nor any systematic way for individuals and employers to identify the digital skills they most need to develop or to articulate the digital skills they currently possess.

As a country, we have not reached collective agreement as to how digital skills should be described across the population. We have no means of understanding how digital skills and proficiency levels relate to each other and how they intersect across VET and school or higher education contexts. Nor do we have a central mechanism for ensuring that training product development and training delivery are informed by the latest information about digital technologies, or agreement on how training products can be best used to create a strategic, yet agile approach to building digital skills across the entire workforce.

The lack of agreement and cohesion risks fragmentation and duplication of effort and waste of valuable resources at a time when investment in digital skills development needs to be increased. This issue has been highlighted by the Australian Digital Inclusion Alliance (ADIA) – an alliance of over 400 business, government, academic and community organisations working together to accelerate action on digital inclusion. Their work has identified 65 current Australian programs, frameworks and strategies that focus on digital inclusion, "all working independently and targeting different groups in Australia".[56]

The most logical mechanism for bringing cohesion to the development of digital skills across the whole workforce is a digital capability framework.

An agreed framework could provide a common language for different stakeholders to use (for example for employers to talk to training providers or employees/potential employees) and could help to build a more seamless learning experience between VET, school and higher education.

A framework could also support lifelong learning by providing a consistent means of mapping and categorising the various types of formal, non-formal and informal learning options on offer (for example AQF qualifications and vendor certifications) and could provide a basis for linking learning to career and workforce development initiatives. There is a proliferation of potential frameworks already in existence. Internationally, there are more than twenty standalone frameworks that articulate digital skills.

[56] Australian Digital Inclusion Alliance (2020) A National Digital Inclusion Roadmap. ADIA.

The types of skills included in digital frameworks tend to be grouped into three areas:

- **Digital literacy skills** - which comprise the essential skills needed by everyone to enable citizenship, social inclusion and economic participation in a digital society
- **General digital skills** – which are needed across the broad workforce to enable effective work in a digital economy
- **Advanced digital skills** – which are the specific skills needed by ICT professionals, technicians and managers working with information technology systems, hardware and software.

One of the most comprehensive and encompassing international frameworks is the *Digital Competence Framework for Citizens* developed by the European Commission and known as *'DigComp 2.1'*. The framework, which has been adopted and adapted by several European countries, comprises eight proficiency levels – from 'foundation' through to 'highly specialised' and covers five areas of digital competency. It is accompanied by a range of guides and activities to support use of the framework across EU countries.[57]

Another well-known international framework is the *Skills Framework for the Information Age* (SFIA), which describes the skills and competencies required by professionals in information and communication technologies, digital transformation and software engineering roles. The focus of this framework however is on advanced or specialised skills needed in ICT-related roles and not the general digital skills required across the broader workforce.

In Australia, there are two frameworks that include digital skills, which are being used in the VET system:

- the new *Digital Literacy Skills Framework*, which is currently being trialled, articulates foundational digital skills and has been developed as a sixth core skill to sit alongside the *Australian Core Skills Framework* (ACSF), which encompasses the foundation skills of Learning, Reading, Writing, Oral Communication and Numeracy
- the *Core Skills for Work Developmental Framework* (CSfW), which comprises a set of non-technical skills, knowledge and understandings that underpin successful participation in work, includes Work in a Digital World as one of its ten skill areas, describing digital skills for the general workforce.

However, neither of these frameworks cover the breadth of digital skills and the range of skill levels contained in the *DigComp 2.1* framework.

Work conducted by the National Centre for Vocational Education Research proposed the development of an 'Australian Workforce Digital Skills Framework'[58]. At the moment, the framework is a high-level outline that could provide the basis for further development of performance detail along the lines of the ACSF or CSfW.

Table 2 provides an overview of the features of some of these frameworks.

[57] https://ec.europa.eu/jrc/en/digcomp/implementation
[58] Gekara, V, Snell, D, Molla, A, Karanasios, S & Thomas, A (2019) Skilling the Australian workforce for the digital economy – Support Document 1: a review of digital skills frameworks literature, NCVER, Adelaide

Table 2. Features of existing and proposed digital skills frameworks

Framework	European Digital Competence Framework (DigComp 2.1)	Digital Literacy Skills Framework (part of the Australian Core Skills Framework)	Core Skills for Work Developmental Framework (CSfW)	Proposed Australian Workforce Digital Skills Framework	Skills for the Information Age (SFIA)
Proficiency/ performance levels	*Seven levels from Foundation to Highly Specialised*	*Four levels of performance from Level 1-3, plus pre-Level 1 Stage A and Stage B*	*Five levels from Novice to Expert*	*Five levels from Literacy to Savvy*	*Seven levels of responsibility from Follow (Level 1) through to Set strategy, inspire, mobilise (Level 7)*
Categorisation of skills	Problem solving - Solving technical problems; Identifying needs and technological responses; Creatively using digital technologies; Identifying digital competence gaps	Active awareness of self as a digital user	Use digitally based technologies and systems	Digital ways of thinking - Digital creativity and innovation and Digital problem-solving	Contains 102 professional skills such as analytics, data visualisation, enterprise and business architecture and network planning
	Communication and collaboration - Interacting through digital technologies; Sharing through digital technologies; Engaging in citizenship through digital technologies; Collaborating through digital technologies; Netiquette; Managing digital identity	Knowledge, use and application of digital literacy skills	Connect with others Access, organise, and present information Manage risk	Digital ways of working - Digital communication and collaboration	
	Information and data Literacy - Browsing, searching and filtering data, information and digital content; Evaluating data, information and digital content; Managing data, information and digital content			Digital ways of working – Data analytics	
	Safety - Protecting devices; Protecting personal data and privacy; Protecting health and well-being; Protecting the environment			Living in the digital age - Digital safety and security and Social and ethical responsibility	
	Digital content creation - Developing digital content; Integrating and re-elaborating digital content; Copyright and licences; Programming			Digital tools for working - Digital device and System competency	

Agriculture Workforce Digital Capability Framework

Some industries are developing their own frameworks to address the digital transformation challenge.

The agriculture industry, led by the Cotton Research and Development Corporation and a group of other Rural Research and Development Corporations, has developed the Agriculture workforce digital capability framework. The framework includes six categories of digital capabilities described over four levels of maturity, supported by five enabling capabilities (i.e. general capabilities).

Supporting the framework of capabilities is a report that identifies the digital and enabling capabilities gaps of the agricultural workforce compared to estimated future needs and a review of current training provision and curricula, along with a self-assessment tool and guide.

In addition to providing a common language, a nationally agreed framework could help to ensure that training efforts are focused on meeting demands for all three types of digital skills (digital literacy skills, general digital skills and advanced digital skills).

Currently in Australia, there is significant focus on foundational digital skills. The advanced digital skills needed for specific ICT applications and occupations are also receiving considerable attention, for example, through the pilot Digital Skills Organisation. However, the general digital skills needed across the whole workforce and the general capabilities needed to navigate the digital transformation of workplaces are less understood, less articulated and receive less attention in training product development and delivery.

Respondents to consultation processes conducted by the Expert Panel, have noted that an agreed framework would need a mechanism for 'future-proofing' to guarantee that it would stay current as technology changes.

They also highlighted the need for the framework to be user-friendly for both employers and educators, and to allow for seamless connection across all education and training sectors.

It would need to be sufficiently general that it could apply broadly across the entire workforce, while also enabling the skills to be identified, customised and taught within the context of different industries and occupations, and for different cohorts of workers (such as older workers). This would require the framework to define digital skills independently of occupations, so that the most appropriate package of skills and skill levels could be identified for each job, role or function and contextualised accordingly.

Many have also suggested that the framework be ideally linked to, or adapted from, an existing agreed framework.

Guidance is needed on how best to capture digital skills in training products

As well as a lack of agreement on which digital skills need to be developed, there is a lack of guidance and therefore consistency in how digital skills should be captured in, and developed through, VET training products (i.e. training package qualifications, skill sets and accredited courses).

Some of the required skills are explicitly captured in the Foundation Skills, ICT and Business Services Training Packages in the form of stand-alone units of competency, skill sets and full qualifications. However, in the majority of Training Packages, digital skills are typically embedded in units of competency and described in broad terms such as 'record', 'analyse' or 'use data'. It is the responsibility of individual VET practitioners to interpret those terms to reflect current technology.

The use of broad terminology is a means of futureproofing units of competency and ensuring relevance across a broad range of workplaces. However, this premise only works as intended if VET practitioners have sufficient vocational currency, as is required by the *Standards for Registered Training Organisations 2015*. The alternative of creating greater specificity in units of competency, particularly in relation to digital skills, can create significant 'churn' in the system as technologies rapidly evolve and require the system to frequently release updated or new units of competency. Specificity can also narrow the applicability of units of competency to different business types and scales of operation.

Stakeholders involved in the Expert Panel consultation processes were supportive of the idea of 'live' resources that are regularly updated and include the detail of how relevant technologies are applied in the industry domain. Training Package Companion Volumes are ideally suited to this purpose. This could help relieve pressure from the 'endorsed' components of Training Packages and at the same time, help VET practitioners keep up to date with the technologies relevant to their industry area.

It has been widely noted in research and consultations that current Training Package development and endorsement processes can be too slow to adapt to changing skill needs, particularly when driven by rapid technological change. Fast-tracking these processes, when updates are driven by technology and where there is key stakeholder agreement, could greatly assist with the challenge of getting new and updated Nationally Recognised Training products 'to market' in a more timely way.

General capabilities also need to be more explicit

Challenges also exist in relation to 'general capabilities' which are becoming increasingly important and needed at higher/more complex levels as digital transformation accelerates and work becomes more human.

General capabilities are typically included in qualifications and units of competency in quite implicit ways. This can create challenges for VET practitioners in identifying, training and assessing them, particularly as they are notoriously hard to teach.

There is also ongoing debate about what general capabilities should be called. Several different models for how they are defined have emerged and faded over the three decades since the national training system was formed. However, many of the legacy terms remain with the resulting proliferation of terms now confusing the issue for VET practitioners and industry stakeholders. Those consulted through the work of the Expert Panel agree that there is a need for clarity of both terminology and definitions for the general capabilities that sit alongside digital skills, particularly given their importance as a platform for lifelong learning and their heightened importance in future-proofing the workforce. Only when we have a common language will we be in a position to have informed conversations between employers, the VET system and learners.

Amongst general capabilities, the ability to learn is being highlighted in the literature as an essential competency for workers to adapt to digital transformation, along with high-level problem solving, critical and analytical thinking, creativity, communication and collaboration skills.

The proposed architecture for revisions of the *Australian Qualifications Framework* (AQF) suggests that several of these skills be included in the AQF taxonomy and expressed as learning progressions.[59] If adopted, this would see learner self-management skills, problem-solving and decision-making skills, the skills to communicate in the learning context and skills to cooperate in the learning context included as mandated elements of qualifications, alongside psychomotor skills (i.e. technical skills) and knowledge.

The challenge in the VET sector though, is that general capabilities (currently referred to in Training Packages as foundation skills) are incorporated in different ways in different training products. As with digital skills, they are frequently described in broad terms that can be difficult for trainers to identify and make explicit in teaching and learning. Training providers also report that because these skills are not explicit in training products, the funding of their development is not adequately covered by training subsidies and not captured clearly in assessment and reporting processes.

[59] 'A learning progression describes what it typically looks like for learners to move from early knowledge, skills and understandings to more advanced knowledge, skills and understandings within a domain' - Learning Progressions in ACER's Work, ACER, 2018

The Australian Core Skills Framework (ACSF) and Core Skills for Work Developmental Framework (CSfW) are used by some Training Packages as the basis for identifying 'foundation skills' and making them more explicit. However, this is not the case for all Training Packages.

To be clear, this strategy is not advocating that general capabilities be taught in the abstract. Their nature necessitates them being developed within their industry context; a fact that is recognised by the AQF review. It recommends that outside of the mandated components described earlier, general capabilities should be incorporated into qualifications as relevant, taught in the context of the qualification's core content and acquired through the process of teaching and learning.[60]

However, simply embedding general capabilities in training products will be insufficient for meeting the growing demand for and premium on these skills. General capabilities need to be captured in training products in a clear and consistent way that makes them easy for practitioners to identify and to teach, learn and formally recognise.

A more explicit and consistent approach to articulating general capabilities in training products also needs to be supported by professional development opportunities for practitioners to assist them in teaching these skills, along with funding that ensures they are given sufficient attention in training programs.

A more explicit and consistent approach would also assist with making general capabilities easier to assess through Recognition of Prior Learning (RPL)[61] processes, which have a critical role to play in the upskilling and reskilling of existing workers, but are currently not well utilised within the VET system.[62]

Training products need to support a strategic approach to workforce development

If Australia's VET system is to support the process of digital transformation, help to rebuild a post-pandemic economy and actively facilitate lifelong learning, then it needs to offer the range of training products necessary for developing the workforce as a whole and throughout individuals' working lives.

Current VET training products are well suited to skilling new entrants, but perhaps not as responsive to the needs of upskilling and reskilling existing workers.

Many stakeholders have suggested that there is a need for more training products that utilise smaller chunks of learning and build upon existing qualifications (such as Skills Sets and micro-credentials), in order to better meet the learning needs of existing workers.

There are also views that as a VET system, we have become too focussed on credentialing at the expense of a more integrated approach to skills and workforce development.

When first conceived, Training Packages were designed as a strategic mechanism to build the skills and therefore productivity of individual industries. Units of competency were, in effect, occupational skills standards and used in multiple contexts to drive

[60] Review of the Australian Qualifications Framework Final Report 2019, p37
[61] Recognition of Prior Learning (RPL) is a type of skills assessment available within the Australian VET system that is intended to certify a person's existing competencies in relation to a nationally-recognised qualification or skill set. RPL can be used prior to undertaking upskilling or reskilling in order to identify skill gaps and reduce the amount of additional training to be undertaken. It can also be used to formally recognise and credential the prior experience and non-accredited training undertaken by workers, which can assist in transitions to new roles.
[62] Osborne, K & Serich, C (2020) Exploring the recognition of prior learning in Australian VET, NCVER, Adelaide. p2

development of skills and pathways within the workplace. They also informed job descriptions, skills analyses, on-the-job training and business planning, and in doing so helped workplaces build an integrated model for workforce development.

Units of competency were sharp and simple but when packaged as a suite of qualifications, they were a powerful tool by which industry could position its workforce for the future and the VET system could produce job-ready graduates.

Digital transformation will trigger change at a level we have not witnessed in our lifetime. Training Packages represent an opportunity to support that shift, particularly if they are strategically reviewed through the lens of the existing worker by the industries and Industry Reference Committees responsible.

Recognising valid upskilling and reskilling pathways through clever design of qualifications and skill sets will become increasingly important to prevent large scale dislocation and could be informed through work of the National Skills Commission on job transitions.

Mechanisms that enable easier identification within training products of skills that are portable across job roles and industries, are also vital, and there are simple solutions with high impact, such as building a semantic search function into the National Register of VET to enable users to search (thematically) for similar skills across the 16,000+ units of competency used in different training products and industry areas.

DEVELOPMENTS TO WATCH

- The *Draft VET Reform Roadmap* proposes to:
  - *'Speed up and streamline existing training package arrangements …'*
  - *'Commence development of a new, simpler and flexible model for national, evidence-led qualifications based around occupational clusters across the full range of the AQF framework'*
  - *'Develop an updated framework for micro-credentials in the national VET system that will facilitate recognition between the tertiary sectors'*
- The Digital Skills Organisation (DSO) pilot is testing innovative solutions to ensure digital training meets the skills needs of employers. The DSO will work on identifying skills needs, developing agile qualifications, and improving the quality of training delivery and assessment.
- The Department of Education, Skills and Employment is developing a *General Capabilities Framework* to build a common language for these highly valued but rarely assessed skills. The Framework is pitched at learners, employers and providers. It will set out the capabilities needed for successful contribution to the workforce, levels of performance and an assessment framework for each capability.
- The National Skills Commission is developing a data-driven Australian Skills Classification. So far, there are around 600 skills profiles of occupations in the Australian labour market which identify the core competencies, specialised tasks and technology tools for each occupation.
- The Foundation Skills for Your Future program supports eligible Australians undertake free accredited and non-accredited training to improve language, literacy, numeracy and digital (LLND) skills. It includes employer or industry-specific workplace training projects developed in collaboration with an employer or industry organisation to deliver tailored LLND training for employees.

THE ISSUE OF STEWARDSHIP (AND STRATEGY IMPLEMENTATION)

One of the areas of critical importance identified by the Panel has been the future stewardship (and implementation) of the *Digital Transformation Skills Strategy*. Whilst the Panel has not been asked to nominate a steward, the Strategy's development brought obvious questions about implementation given the inherent complexities of implementing a strategy that meaningfully connects issues such as, national innovation performance, workforce productivity improvement, international trade competitiveness, and taxation policy.

As evidenced by the discussion presented throughout this document, the Strategy is multi-faceted, multi-sectoral and designed to apply to the entire national workforce. The Strategy is essentially about driving cultural change across all Australian industry sectors, within each Australian workplace, and throughout the national VET sector. In essence, building the digital competence, higher-order cognitive skills and general capabilities of the Australian workforce will impact every job and therefore requires upskilling and reskilling to be normalised for all Australian enterprises.

The scale of change and size of task begs an obvious question about implementation. Specifically, who is best positioned to implement the Strategy?

While elements connected to VET may be considered by the Australian Industry and Skills Committee, given its responsibility for commissioning the work, the Strategy also identifies pioneering elements relating to the implementation of lifelong learning and raising of co-investment pools (i.e. public and private funding) for skills development using non-traditional taxation incentives and individual learning accounts.

The multi-faceted nature of this Strategy suggests that there is no single 'natural' owner within the VET system – or indeed within the broader education system. While related fora such as the Prime Minister's

Digital Technology Taskforce and the National COVID-19 Coordination Commission are progressing part of some elements of work that are related to this Strategy, its broad nature does not sit naturally with the charter of either of these important national mechanisms.

The Panel believes that the practical achievement of this Strategy will require unprecedented collaboration of all Australian governments, business, industry and unions. Done well, implementation of this Strategy will enable Australia to realise substantial workforce productivity benefits from our existing workforce while simultaneously building a more inclusive society that ensures that no worker is left behind.

KNOWLEDGE PLATFORM

To support its work, and help build stakeholders' knowledge of what digital transformation means for the world of work, the Expert Panel established a simple 'knowledge platform' on its website to house a curated selection of key reports, websites, videos and social media feeds.

Many of the reports are referenced throughout the strategy. Rather than lose these insights now that the Panel's work has concluded, we include some of them here.

VIDEOS

- A jobs creation strategy for the fourth industrial revolution – World Economic Forum, 2019
- Centre for the Fourth Industrial Revolution Network – World Economic Forum, 2019
- Closing the skills gap – World Economic Forum, 2019
- How to transform society through digital – World Economic Forum
- What is the Fourth Industrial Revolution? – World Economic Forum, 2016

REPORTS

- A blueprint for designing inclusive skills policy for the digital age – Nesta, 2018
- Digital Australia, seizing the opportunity from the fourth industrial revolution – McKinsey, 2016
- Digital innovation: Australia's $315b opportunity – alphabeta/CSIRO Data61, 2018
- Digital megatrends: A perspective on the coming decade of digital disruption – CSIRO Data61, 2019
- Embracing a culture of lifelong learning – UNESCO, 2020
- Empowering adults through upskilling and reskilling pathways – CEDEFOP, 2020
- Future-ready adult learning – OECD, 2019
- Getting skills right: Financial incentives to promote adult learning in Australia – OECD, 2019
- Industry 4.0 Testlabs in Australia – Prime Minister's Industry 4.0 Taskforce & Swinburne University of Technology, 2017
- Jobs of Tomorrow: Mapping opportunity in the new economy – WEF, 2020
- Mapping Australian Workforce Change – alphabeta, 2018

- New foundational skills of the digital economy – Burning Glass, 2018
- No longer optional: Employer demand for digital skills – Burning Glass & UK Government, 2019
- OECD Skills Strategy 2019: Skills to Shape a Better Future – OECD, 2019
- Our shared digital future – building an inclusive, trustworthy and sustainable digital society – World Economic Forum, 2018
- Premium skills – The wage premium associated with human skills – DeakinCo Deloitte Access Economics, 2019
- Small Business Digital Taskforce – Report to Government, 2018
- Soft skills for business success – Deloitte/DeakinCo, 2017
- Technology and the future of Australian Jobs – Oxford Economics and CISCO, 2019
- Technology impacts on the Australian Workforce – Australian Computer Society/Faethm, 2020
- The changing nature of work and skills in the digital age – European Commission, 2019
- The futures of work: what education can and can't do – UNESCO, 2020
- The path to prosperity – Why the future of work is human – Deloitte Insights, 2020
- Towards a reskilling revolution: A future of Jobs for all – World Economic Forum and The Boston Consulting Group, 2018
- The Automation Advantage – AlphaBeta, 2017
- Work for a brighter future – Global Commission of the Future of Work, ILO, 2019
- World digital competitiveness ranking – IMD, 2020

ARTICLES

- 'Education should be like everything else. An on-demand service' – World Economic Forum
- Future-ready adult learning systems – OECD
- How future-ready is Australia's adult learning system? – OECD
- Making sense of skills – A UK skills taxonomy' – NESTA
- Putting faces to the jobs at risk of automation – OECD
- Regional Job Automation Pack – Regional Institute Australia
- The path to prosperity: Why the future of work is human – Deloitte

TWITTER

- CSIRO and Data61
- DQ Institute
- ILO SkillsforEmployment
- OECD
- Skills Panorama
- World Economic Forum

WEBSITES

- CEDEFOP – European Centre for the Development of Vocational Training – works with the European Commission, Member States' governments, employer and trade union reps, VET researchers and practitioners to provide up-to-date information on developments in VET
- DQ Institute – the international think-tank dedicated to setting global standards for digital intelligence education, outreach, and policies
- ILO Global Commission on the Future of Work – the tripartite U.N. agency, which brings together governments, employers and workers of 187 member States, to set labour standards, develop policies and programs to promote decent work for all women and men
- NESTA – innovation foundation – based in the UK, the charity works with organisations across the globe and in a broad range of sectors to promotes innovation
- Organisation for Economic Co-operation and Development – intergovernmental economic organisation founded to stimulate economic progress and world trade
- Skills for Employment – Global public-private knowledge sharing platform – Initiated by the ILO, the Knowledge Sharing Platform benefits from the support and collaboration of the OECD, UNESCO and the World Bank.
- World Economic Forum – the key forum which engages the foremost political, business, cultural and other leaders of society to shape global, regional and industry agendas

METHODOLOGY

Analysis of national and jurisdictional approaches being taken within **Australia** to support the workforce meet the challenges of digital transformation

Analysis of existing digital skills and soft skills within **nationally endorsed qualifications** (contained in Training Packages)

Analysis of how vocational training systems of select **international economies** are supporting their workforce to meet the challenges of digital transformation

Analysis of future digital skill priorities set out in the 2019 **Industry Skills Forecasts** developed by the 67 Industry Reference Committees

PHASE A: RESEARCH AND ANALYSIS

PHASE B: CONSULTATION AND ENGAGEMENT

Survey of the 67 **Industry Reference Committees** to elicit views on how the VET system can best support the existing workforce in response to the impact of digital transformation

Survey of **employer and union bodies** to to elicit views on how the VET system can best support the existing workforce in response to the impact of digital transformation

Public release of **Discussion Paper** on the five focus areas, goals and potential action points of the Digital Transformation Skills Strategy

Virtual key stakeholder **Roundtable** to explore findings of the research and analysis, consultation and engagement phases and discuss the strategy's focus areas

Virtual consultation with **industry peak bodies**, **State Training Authorities**, **VET regulators** and **training provider peak bodies** to elicit views on how the VET system can best support the workforce and to identify where structural or cultural barriers/policy blockages or sensitivities exist

Prepared by

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