

# Skills urgency

Transforming Australia's workplaces

APRIL 2021



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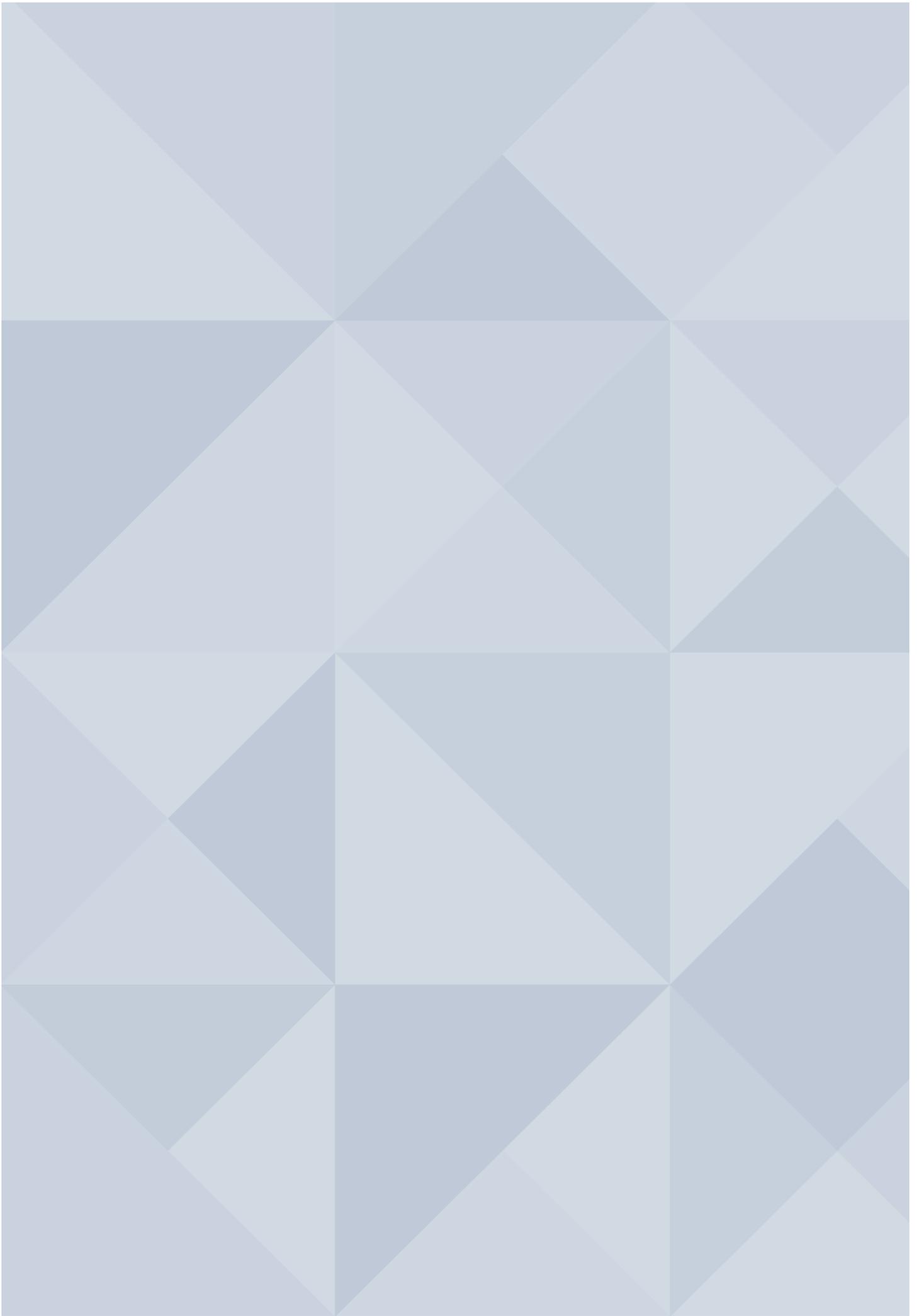
A large red geometric graphic consisting of a solid red triangle on the left and a white triangle with a thin red outline on the right, both pointing towards the right. The white triangle is larger and partially overlaps the red triangle.





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# About this report



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This report frames the Australian skills landscape as one facing much change and in need of urgent attention. It outlines some of the strains on companies, strategies being applied, and connections being made with education and training systems. It offers some model workforce development approaches and includes leading initiatives being taken by companies to meet skills challenges. Finally the report discusses the need for intensified action in key areas not new to many, but seen by Ai Group as insurmountable without new levels of engagement across the broad skill ecosystem.

Ai Group is using the skill ecosystem concept loosely to emphasise the inter-dependency of component actors when getting the skills equation right - including companies and industry, education and training providers and systems, policy settings and governments, and individuals and community. Skill ecosystems usually exist within regions, sectors or supply chains and must be nourished<sup>1</sup> through many co-existing elements that come together to enable innovation, growth and competitiveness.

It is no coincidence that the release of this report coincides with the launch of Ai Group's Centre for Education and Training. Our new Centre has been established to work with those in the skill ecosystem: to explore new ways of building skills and capabilities for companies and individuals to succeed now and into the future. Its proactive research, policy and advocacy agenda will strive to ensure Australia's skill development outcomes are in line with current and emerging economic needs. It will work to link the real needs of industry with the training, education and career aspirations of individuals.

Ai Group sees the report as a thought starter for encouraging bigger change around skills in Australia. The Centre will work to influence key areas for action identified in this report: new templates for partnerships; digital skills development integrated with human capabilities; a re-imagined apprenticeship system; work-based learning as a core principle in qualifications; and flexible qualifications allowing shorter-form training.

We welcome approaches to the Centre from like-minded agencies and individuals across the broad skill ecosystem.

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<sup>1</sup> Finegold,D., Creating self-sustaining, high-skill ecosystems, Oxford Review of Economics 15 (1), 1999.



# Key Considerations

This report is intended to be a thought starter for encouraging bigger change around skills in Australia. It is aimed at stimulating discussion around a number of key considerations intended to contribute to further debate and action on this critical economic driver:

- ▶ A cocktail of factors is converging to create an urgency to skills formation and development.
- ▶ Australia is not rated by the World Economic Forum as one of the best-placed countries for tertiary education to deliver what employers need.
- ▶ Research on the changing workplace is showing that the nature of work is evolving. It speculates that the way people work is changing in an unprecedented way.
- ▶ Skills development needs a different approach for the future: where learning is not separate from doing; where we immerse learning in work environments.
- ▶ Strains on companies evident from a skill needs survey Ai Group undertook late in 2020 show:
  - » technicians and trades workers are re-emerging as the most difficult roles to fill
  - » basic digital skills are needed the most out of all digital skills
  - » an increased demand for soft skills
  - » an increased commitment to taking on apprentices
  - » a positive attitude and soft skills are the most important entry level recruiting factors
  - » wage subsidies are needed for many employers to take on displaced workers and young people
  - » employers would take on more university or TAFE students as higher apprentices, cadets or interns to increase their skill levels as their business needs change.
- ▶ It is important to share and learn from real life stories of employers taking action and demonstrating their commitment to build skills in their organisations. This report shares some varied initiatives.
- ▶ Skills urgency is pointing to the need for new responses, new support and upscaled collaborations across Australia's broad skill ecosystem.
- ▶ Future-focused education and training delivered with, and in, industry should be our overall goal. More intensified action must help to establish:
  - » new templates for partnerships across the skill ecosystem
  - » broad digital skills development integrating human capabilities
  - » a re-imagined apprenticeship system
  - » work-based learning as a core principle in qualifications
  - » flexible qualifications allowing short form training.

# 01

## Why skills urgency?

- ▶ Long-term skill gaps persisting
- ▶ Digitalisation accelerating
- ▶ Changing tasks in roles
- ▶ Human-centred skills
- ▶ Changing job mixes in workplaces
- ▶ Real-time upskilling
- ▶ Collaborative technologies
- ▶ Slow pace of traditional education and training

We are at a juncture where the pace of change is colliding with the development of skills. New technologies are reshaping existing industries and creating new ones.

Skills underpin all work. They are the driving elements in all industry and individual enterprise. They are always evolving. However, a cocktail of factors is converging to create an urgency to skills formation and development. Australia has experienced disruption to skills caused by the pandemic creating lumpy, unpredictable and new skill demands. As Australia experiences a strong recovery and employment growth surges in some sectors<sup>2</sup>, long held skill gaps have re-emerged for businesses.

New skill stresses have emerged as population shifts occur. We are at a juncture where the pace of change is colliding with the development of skills. New technologies are reshaping existing industries and creating new ones. Workplace cultures are shifting. Higher productivity is being achieved through remote-work arrangements and multiple, rapid meetings.<sup>3</sup> Data science and interpretation are becoming larger parts of many roles. Circular and sustainable planning and processes loop in new capability needs. Corporate social responsibility endeavours are colliding with skills as companies consider diverse cohorts disadvantaged through COVID-19 when re-building capabilities. The skills development and employment of younger-aged Australians has been disproportionately affected.

Major disruption in industry through digitalisation should be seen as a natural trigger for major disruption in education and training. Under current education and training models, development is often not quick enough to recalibrate the skills required for entry level employees. Companies are struggling to find timely, relevant short programs to re-skill existing workers at pace. Learning models are under pressure. Educators are exploring how to prioritise and integrate the human-centred skills increasingly flagged as dominant skills for the future. Skilled migration has plummeted creating opportunities to improve the system during the pause in student arrivals.<sup>4</sup>

## Talent gaps remain large

Amidst these pressures, the World Economic Forum (WEF) has found that human capital development across advanced economies over the past decade has stagnated: talent gaps remain large and a number of advanced economies have experienced downward trends in adequacies of skill sets of all graduates in recent years.<sup>5</sup> In advanced economies the adequacy of tertiary education to meet the needs of employment is rated at 68 points out of one hundred. The ability to find skilled employees has declined as a result.

<sup>2</sup> For example, Recruitment Experiences and Outlook Survey, National Skills Commission January 2021; and The Australian Industry Group Australian Performance of Manufacturing Index, March 2021.

<sup>3</sup> Speed and resilience: five priorities for the next five months, McKinsey, March 2021.

<sup>4</sup> A good match: optimising Australia's permanent skilled migration, Committee for Economic Development of Australia, March 2021.

<sup>5</sup> How Countries are Performing on the Road to Recovery, The Global Competitiveness Report, World Economic Forum, 2020.

## Australia is not rated by the WEF as one of the best-placed countries to deliver to the needs of employers.

These Australian skill stresses reflect the key issues impacting skills in the global economy now and over the next few years. The World Economic Forum (WEF)'s Future of Jobs report 2020<sup>6</sup> aggregates public and private data along with views of business leaders. Its key skills-focussed findings are not new but provide a global confirmation of the issues affecting Australia:

- the pace of technology adoption is expected to remain unabated and may accelerate in some areas
- skills gaps continue to be high as in-demand skills across jobs change in the next five years
- although the number of jobs destroyed will be surpassed by the number of 'jobs of tomorrow' created, job creation is slowing while job destruction accelerates
- the future of work has already arrived for a large majority of the online white-collar workforce
- online learning and training is on the rise but looks different for those in employment and those who are unemployed
- the window of opportunity to re-skill and up-skill workers has become shorter in the newly constrained labour market
- despite the current economic downturn, the large majority of employers recognise the value of human capital investment
- the public sector needs to provide stronger support for reskilling and upskilling for at-risk or displaced workers.

The WEF sees the ability to re-charge the global economy and create jobs to be largely dependent on further concerted efforts to accelerate digital transformation, especially within SMEs.

The WEF sees the ability to re-charge the global economy and create jobs to be largely dependent on further concerted efforts to accelerate digital transformation, especially within SMEs. Digital transformation skews the nature of work towards hard-to-automate activities and jobs. It changes two aspects of work: the mix of work activities (or tasks) that constitute a job, and the mix of jobs in the economy. The WEF's research on the changing workplace is showing there is an evolution to the nature of work.<sup>7</sup> It speculates that the way people work is changing in an unprecedented way.

The skills evolution is likely to continue. As advances in AI continue, more complex cognitive tasks could be automated potentially affecting higher skilled knowledge jobs. The WEF reports on a particular global shortfall in digital skills and other skills of the new economy as technology disrupts labour markets. It confirms that technological change is set to displace a range of skills while driving greater demand for new core skills (analytical thinking, creativity and critical thinking as well as skills in the use and design of technology). The skills of 'high-touch' / hands-on roles across different sectors, e.g. Health and Manufacturing, will still be needed and will grow, but will be augmented by new technologies.

<sup>6</sup> Future of Jobs report 2020, World Economic Forum, October 2020.

<sup>7</sup> Frank, K. and Frenette, M., Are new technologies changing the nature of work? The evidence so far, Institute for Research on Public Policy, Canada, January 2021.

While all citizens will require digital literacy, at the other end of the spectrum advanced digital roles will increase by 25 per cent by 2030

Employment will shift towards complex cognitive tasks such as motivating teams or resolving conflicts - people capabilities normally developed over the course of a career. This will place new constraints on the employment of young workers.

A recent Forrester study<sup>8</sup> parallels earlier reports that forecast many tasks and roles that can be more readily copied by automated systems will be obsolete by 2030. In contrast human-centric roles and cross-domain knowledge worker jobs will increase. These roles will continue because they identify context and process highly variable inputs. The roles of leaders will be vital, communicating and facilitating organisational change, however they are likely to be different from many current manager and coordinator roles.

While all citizens will require digital literacy, at the other end of the spectrum advanced digital roles will increase by 25 per cent by 2030. The significant amount of training and expertise needed to meet these skill needs is daunting – well beyond minor re-skilling efforts. 2020 research released by the National Skills Commission identified 25 emerging occupations that have evolved as the way we work changes. Heavily based around technology, these occupations have been identified by combining traditional and near real-time data using data science techniques. The occupations are grouped under seven clusters: Data Analytics, Digital Deepening, Emerging business practices, Health, Refreshing ANZSCO, Regulatory and Sustainability, Engineering and Trades.

## The economy's resilience and growth is welcome but is causing more skills pressures

Amidst the skills turmoil, many parts of the Australian economy are proving to be resilient and have the potential to grow. Australia's National Skills Commission (NSC) found evidence that employment strongly rebounded after its rapid decline caused by the pandemic.<sup>9</sup> Between May and October 2020 it increased 5.3 per cent. The Australian Industry Group's March 2021 results for the Australian Performance of Manufacturing Index, indicated a sixth consecutive month of strong recovery across the full range of manufacturing sectors. The Construction and Services sectors have also experienced recovery in recent months.

There are clear opportunities for growth in major industry sectors, provided the skills pipeline can be filled to enable a continuing workforce that benefits both employers and employees. CSIRO's report into recovery and resilience after COVID-19, explores opportunities to leverage science and technology<sup>10</sup>. In that report, across the six industry

8 Higgins, S, Meena, S, Gownder, J.P, Barnes, M, Sebastin, S, Nagel, B, Future Jobs: Australia's Automation Dividends And Deficits, 2020 to 2030, Forrester, February 2021.

9 The shape of Australia's post COVID-19 workforce, National Skills Commission, December 2020.

10 COVID-19: Recovery and resilience, CSIRO, September 2020.

It is noteworthy that 41 per cent of the STEM occupations feature on the resilient occupations list compared with 30.7 per cent of occupations overall...

sectors investigated, the levels of workforce skills for most are seen as advantages when capitalising on opportunities.

In December 2020 the NSC released an occupational resilience framework which ranks 358 occupations using pre-pandemic employment growth expectations, the COVID-19 employment shock, and the COVID-19 recovery.<sup>11</sup> It is noteworthy that 41 per cent of the STEM occupations feature on the resilient occupations list compared with 30.7 per cent of occupations overall, demonstrating their importance to industry.

Young people are proportionately less represented in the resilient occupations. Younger generations are being shaped by uncertainty as work changes, but one report discusses the benefit this could have for young people in developing characteristics that are useful to businesses setting up for the future: resilience, fast tech adoption, constant learning, tenacity, and an ethical stance.<sup>12</sup>

Many responses are required to tackle the complex set of issues surrounding skills in Australia. The Foundation for Young Australians<sup>13</sup> has researched the changes coming to the workplace and contends that increasingly we are working to learn; needing to learn new skills on a daily basis.

This paradigm provides direction for the kinds of responses we must consider in order to progress. Skills development needs a different approach moving forward: where learning is not separate from doing; where we immerse learning in work environments.

11 The shape of Australia's post COVID-19 workforce, op. cit.

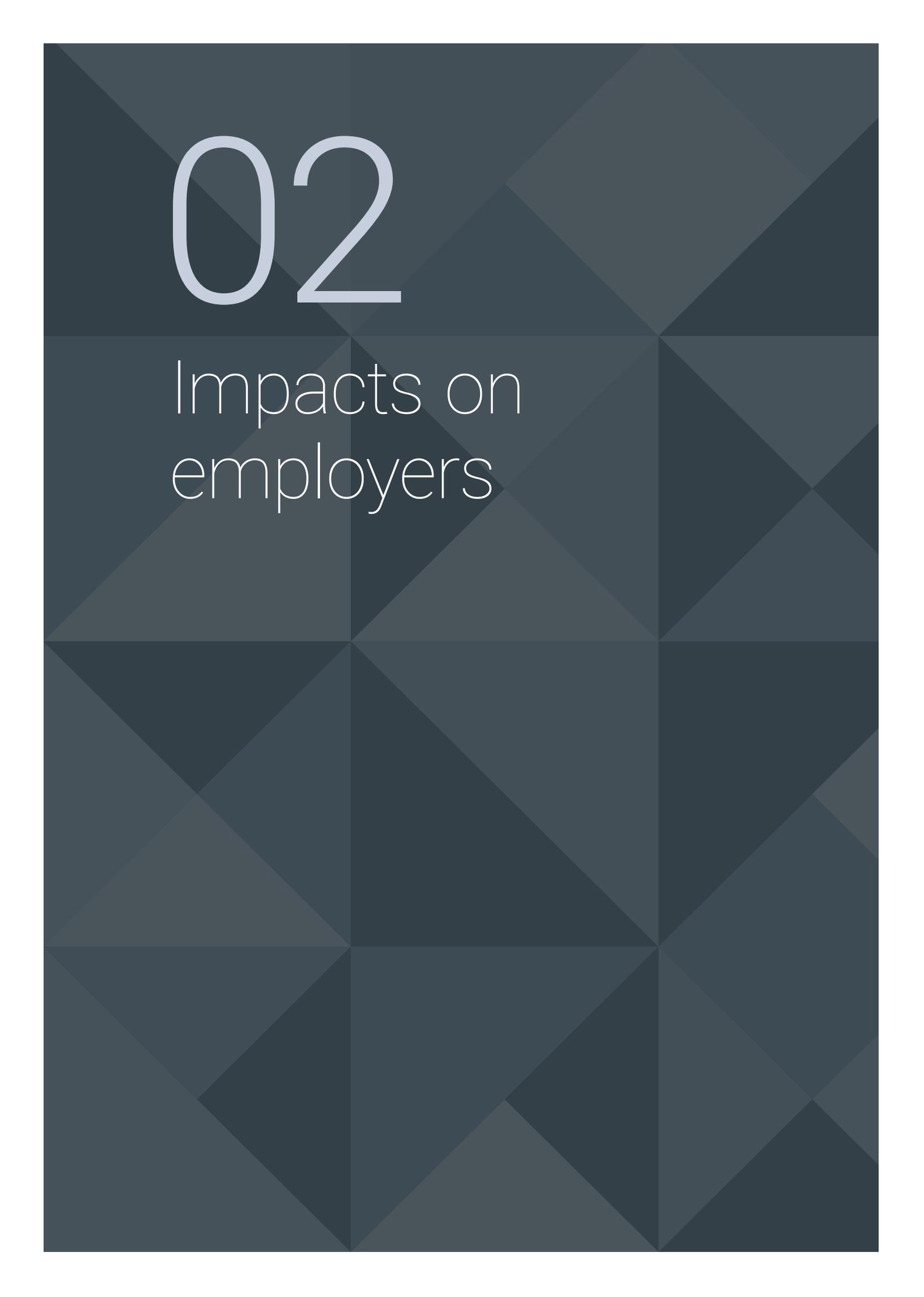
12 The skills new grads have that the rest of us should pay attention to, Yahoo Finance, January 2021

13 The New Work Reality, Foundation for Young Australians, 2018.

## A take on future skills

Gleaned from discussions with members and consistent with a range of reports that examine future skill needs, the following broad skill categories are seen as vital to future workforce capability. These skills form the basis for companies transforming for future digitalised scenarios.

<p><b>Leadership skills</b></p> <p><b>Knowing how to move to, thrive and innovate in all environments</b></p>	<ul style="list-style-type: none"> <li>• Developing digital-at-the-core vision, strategy and risk</li> <li>• Mapping technology architectures</li> <li>• Decision-making using real-time data</li> <li>• Aligning a rapidly up-skilled workforce with strategy</li> <li>• Building intelligent, adaptive and agile operations</li> <li>• Collaborating to create new value</li> <li>• Moving to sustainable, circular business models</li> </ul>
<p><b>Digital skills</b></p> <p><b>From advanced digital technology specialisations through to widespread basic digital skills for all occupations</b></p>	<ul style="list-style-type: none"> <li>• Advanced skills specific to sectors and roles, e.g. engineers, technicians and trades workers, health workers</li> <li>• Complex data engineering, architecture, and analytics</li> <li>• AI/machine learning/mobile machinery</li> <li>• Blockchain technology</li> <li>• Cloud computing</li> <li>• Cyber security</li> <li>• Augmented Reality/Virtual Reality</li> <li>• Sophisticated logistics/supply chain management; sourcing and procurement; asset management</li> <li>• Advanced sustainability: environmental monitoring; energy management, use and procurement</li> <li>• Advanced maintenance and diagnostics</li> <li>• Remote operations</li> <li>• Marketing and customer experience analysis</li> <li>• Basic digital literacy (whole workforce)</li> </ul>
<p><b>Human skills</b></p> <p><b>Knowing how to work with other humans and machines in all environments</b></p>	<ul style="list-style-type: none"> <li>• Cross-functional teaming</li> <li>• Creativity</li> <li>• Analytical thinking</li> <li>• Complex problem solving</li> <li>• Adaptability</li> <li>• Active learning</li> <li>• Resilience</li> </ul>



# 02

Impacts on  
employers

Employers have experienced ongoing skills shortages for Technicians and Trades Workers, with Ai Group and the Department of Industry finding this category experienced the most significant shortages in 2018.

Throughout the pandemic in 2020, Ai Group collected detailed reports from Australian businesses about broad COVID-19 impacts, responses and requirements. Late in 2020 we undertook a survey that focussed specifically on the skill needs and workforce development plans of businesses as they ramped up their activity. Ai Group surveyed CEOs nationally receiving 115 responses from companies employing a total of 39,447 people.

The responses are not intended to be a representative sample of the Australian economy, however they are a representation of Ai Group's members. Responses came from a mix of industry sectors: Manufacturing (58.5 per cent), Construction (9 per cent), Services (13 per cent), Mining (3.5 per cent) and other sectors (16 per cent). Respondents represented all company sizes: 31 per cent small-sized, 45 per cent medium-sized, and 24 per cent large-sized businesses. We are grateful to those who took the time to respond during a time of recovery from COVID-19.

The survey aimed to test more directly the level of skills urgency described in Section 1 as identified through global and Australian reports. Ai Group will combine these snapshot findings with external data and anecdotal evidence to continue to develop a full picture of the major skill issues and skill-related actions of employers.

## Technician and trades worker skills the most difficult to meet

Employers were asked if skill needs had increased across a range of occupational categories and whether they were having difficulty meeting their skill requirements. Respondents reported that the Technician and Trades Worker category is experiencing the greatest need for skills (49 per cent), followed by Professionals (39 per cent), Sales Workers (32 per cent) and Managers (30 per cent). Technician and trades worker skills were also the most difficult to meet. Employers have experienced ongoing skills shortages for Technicians and Trades Workers, with Ai Group and the Department of Industry finding this category experienced the most significant shortages in 2018.

**CHART 1: Skill requirements and level of difficulty in meeting skill needs**



**Trades worker roles hardest to fill** electricians, fitters and turners, boilermakers, fabricators, welders, machinists, sheet metal workers, toolmakers and diesel mechanics

**Manager roles hardest to fill** operations, production and project, supply chain, logistics, water, marketing and business development managers.

**Engineer roles hardest to fill** maintenance, mechanical, mechatronic, electronic, process, aerospace and sales engineers.

**Digital roles hardest to fill** 'digital experts', software engineer, RFID solutions architect and SAP business analyst.

## Basic digital skills need to increase the most out of all digital skills

Employers were asked to indicate the digital areas for which they most needed to increase their employee capabilities. Taking employers' top three rankings for the digital capabilities most needing to increase, basic digital skills represent the greatest need, totalling 44.5 per cent. The need for increased capabilities in Cyber Security closely follow

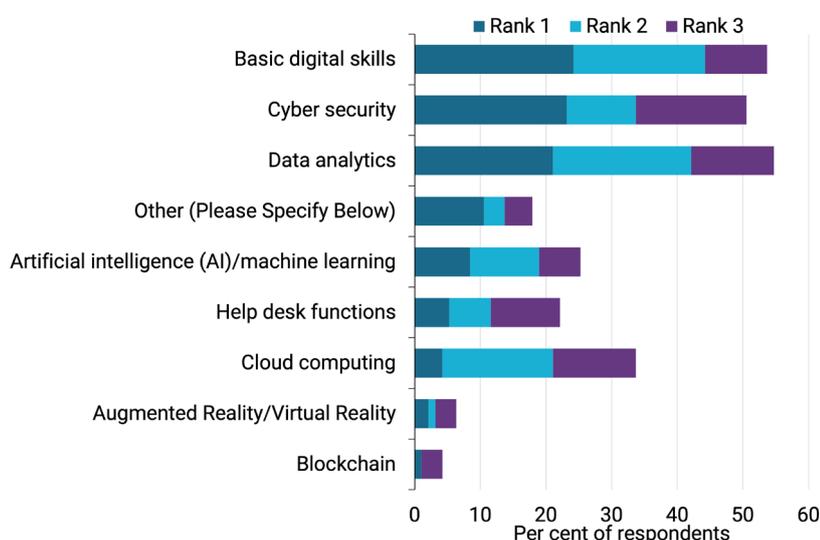
This result suggests that fewer employers were venturing into more advanced technologies late in 2020 as they focus on regenerating their businesses.

representing 42.5 per cent of the top three rankings, with Data Analytics at 41.5 per cent.

This result suggests that fewer employers were venturing into more advanced technologies late in 2020 as they focus on regenerating their businesses. The increasing need to digitalise operations is likely to require employers to develop digital strategies and the capacity to adopt, and have employees engage, with more advanced technologies.

**CHART 2: Digital areas in which employee capabilities most need to increase**

\*as a proportion of respondents that provided at least one ranking



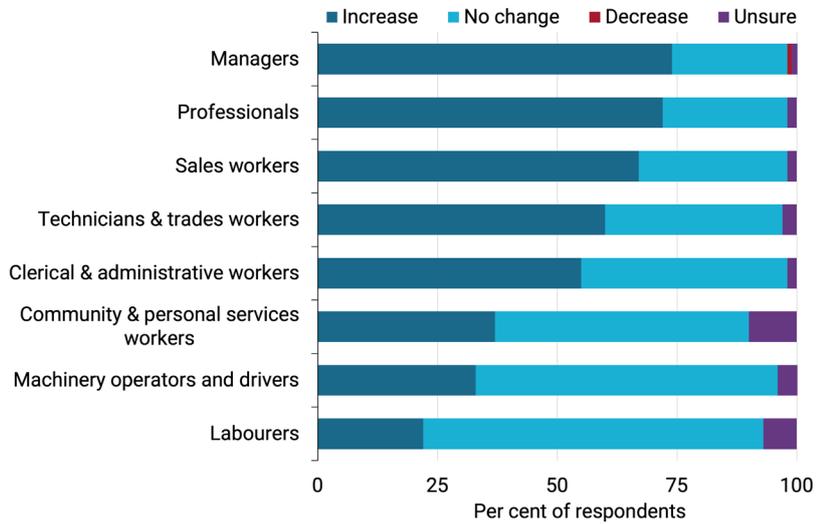
## Managers and professionals are prioritised for digital skills training

Where employers are providing digital skills training, across their top three rankings those seen as most urgently requiring training are Managers (44 per cent), followed by Professionals (41 per cent).

## Increased demand for soft skills

The survey asked employers whether the need for soft skills (e.g. problem solving, adaptability, creativity, communication, initiative) had changed in their organisation over the last 12 months. Employers demonstrate they have a growing need for soft skills. Demand has increased substantially across a number of occupational categories: Managers (74 per cent), Professionals (72 per cent), Sales Workers (67 per cent), Technicians and Trade Workers (60 per cent), and Clerical and Administrative workers (55 per cent).

**CHART 3: Change in need for soft skills over the last 12 months**

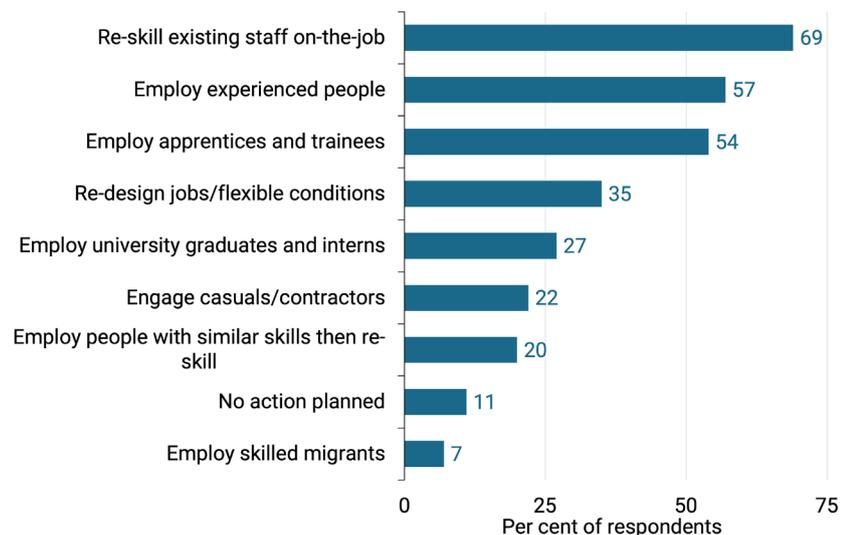


Sixty-nine per cent intend to meet skill needs by re-skilling existing staff on the job.

## Employers will mostly re-skill to meet skill needs

Employers were asked what action the business will take to meet skill needs over the next 12 months. Sixty-nine per cent intend to meet skill needs by re-skilling existing staff on the job. This represents a significant investment in training their own employees. Fifty-seven per cent intend to meet their needs by employing experienced people. A small percentage (7 per cent) said they would employ skilled migrants, reflecting the limited short-term prospects of being able to do so.

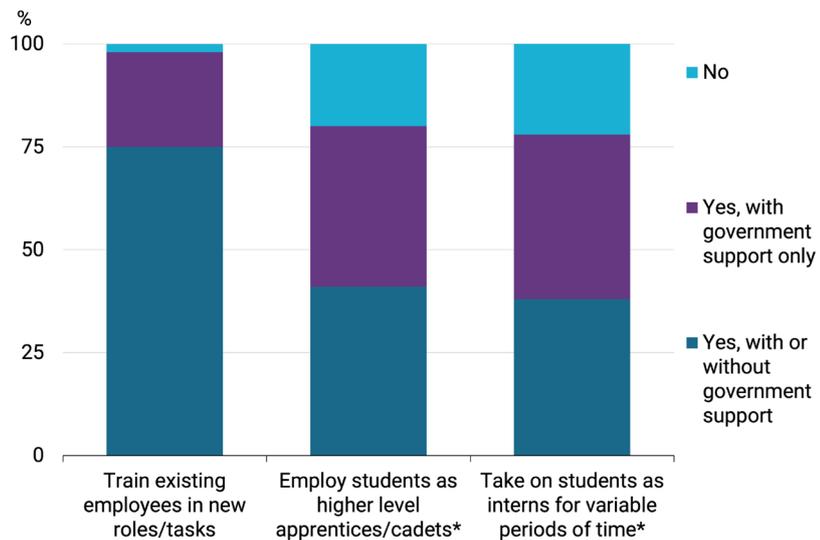
**CHART 4: Employer action to meet skill needs over the next 12 months**



## As business needs change, employers would take on more university or TAFE students as higher apprentices, cadets or interns to increase business skill levels

The survey asked employers, as their business needs change, whether they would use any of three specific strategies listed to increase employees' skill levels. Seventy-five per cent would train existing employees in new roles/tasks with or without government support. There is also an appetite for employers to increase employees' skill levels by taking on university and TAFE students as higher apprentices, cadets (41 per cent) or interns (38 per cent) with or without government support. However a similar amount of employers would only employ them if government support is available.

**CHART 5: Strategies used to increase employees' skill levels**



Companies indicate a strong preference for short courses, intending to use education and training providers from a spread of categories.

## Employer preference for short courses

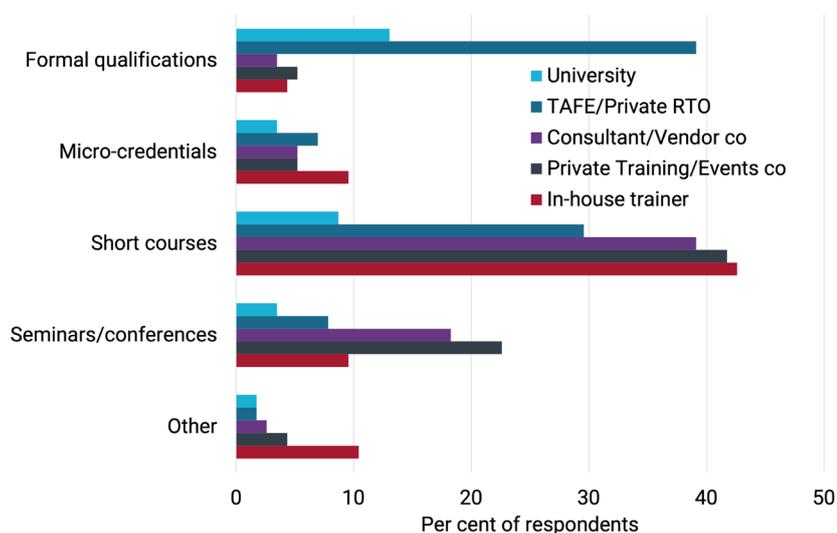
Employers were asked if they plan to provide training and development over the next twelve months and what types of provider and training they will use. Companies indicate a strong preference for short courses, intending to use education and training providers from a spread of categories. Universities will be the least used for short courses. In-house trainers, consultants and vendor companies, and private training and

Few companies indicate an interest in accessing micro-credentials as part of their employee training and development.

events companies are the preferred deliverers of short courses. Those companies intending to invest in formal qualifications indicate a much greater use of TAFEs and private RTOs over other providers.

Few companies indicate an interest in accessing micro-credentials as part of their employee training and development. Universities and TAFEs have in recent times promoted micro-credentials as a new option designed to address rapidly changing industry needs. The low intended take-up potentially highlights the need for greater engagement with industry in the development of micro-credentials.

**CHART 6: Types of training and provider to be used over the next 12 months**



## Increased commitment to apprentices

The survey asked whether those employers with apprentices/trainees intend to increase their numbers over the next twelve months. Fifty-eight per cent of respondents intend to increase their numbers. No companies intend to decrease apprentice or trainee engagement.

Asked about the strategies to increase the number of trade qualified people in their companies, 80 per cent state they will employ more apprentices, while 52 per cent intend to employ experienced tradespeople. 28 per cent will offer apprenticeships to existing workers and another 28 per cent are prepared to support existing workers to study trade qualifications outside of working hours. A small percentage (11 per cent) will use skilled migration as a strategy, a similar response to employers' strategies for meeting all skill needs.

17 per cent are prepared to employ workers who have completed trade training without having undertaken an apprenticeship. The Productivity Commission and some state governments have recently recommended

The Productivity Commission and some state governments have recently recommended or announced the exploration of models that involve institution-only trade training as a response to the need for more qualified trades people.

or announced the exploration of models that involve institution-only trade training as a response to the need for more qualified trades people. There are a number of factors for employers to consider before employing trades people that have not completed apprenticeship training contracts.

**CHART 7: Strategies to increase trade qualified people**



## Eighty-four per cent would employ a displaced worker if supported by wage incentives and subsidies

Asked what government support would assist them if they were to employ a displaced worker, it is clear that government wage incentives and subsidies would have a strong influence on companies. Eighty-four per cent of employers say wage incentives and subsidies would influence their decision to employ a displaced worker.

Forty per cent of employers indicate that short-courses and micro-credentials in industry and occupation relevant skills would assist them with employing a displaced worker.

## Seventy-nine per cent influenced by wage subsidies to employ young people

Seventy-nine per cent of employers indicate that a wage subsidy would assist them when employing an unemployed young person. Fifty-eight per cent indicate that industry relevant pre-employment programs would be of assistance.

Work experience is a precondition to taking on a young person for 39 per cent, highlighting the importance of work-based learning, structured workplace learning and work experience in schools, and the value of work integrated learning, internships, traineeships and apprenticeships at the tertiary level.

## Most important entry level recruiting factors: positive attitude and soft skills

Employers were asked what the most important recruitment factors are when employing school leavers and graduates. Fifty-three per cent state that a positive attitude and soft skills (communication, problem solving, teamwork etc.) are the most important factors. Other first ranked recruiting influences include relevant work experience (15 per cent), relevant qualifications (13 per cent), similar experience/qualifications to the role (9 per cent), and a relevant pre-employment course (7 per cent).

## Increasing employer links with universities and TAFEs greater than schools

Employers were asked, if they have links with secondary and tertiary education providers, how they intend to change them over the next 12 months. Thirty per cent who have an existing relationship with TAFE / VET providers say they will increase existing relationships in 2021, while 17 per cent will establish new relationships.

Similarly, 27 per cent of employers with an existing relationship with higher education / university providers say they will increase existing relationships, with 15 per cent indicating they will establish new links.

Employers are less inclined to change engagement with secondary schools, with 10 per cent indicating they will increase existing relationships and 16 per cent establishing new relationships.

# 03

## Solving skills challenges: strategies and stories of employers taking the lead

- ▶ BAE Systems Australia
- ▶ HYDAC
- ▶ Sage Automation's Skills Lab
- ▶ CV Services
- ▶ TEi Services
- ▶ Agilent
- ▶ Australian Vinegar

These company stories show examples of employers taking initiative to build the skills they need.

This report has raised the urgent need for change in the broad skill ecosystem. The previous section outlined skills challenges facing employers and their intended actions. This section of the report captures just a few of the many stories of employers taking action and demonstrating their commitment to skills development and retention in their organisations. These company stories show examples of employers taking initiative to build the skills they need.

The stories demonstrate that employers regularly develop and execute strategies to solve their challenges. Enduring skills gaps and mismatches in recent years have led many employers to look for short-term solutions by:

- re-analysing their skill searching and recruitment strategies
- looking internally and re-organising
- re-training and training up
- mixing new apprentices and trainees and higher apprentices with existing workers
- employing skilled migrants and/or
- accessing university and/or vocational education and training students through placements, projects and other activities.<sup>14</sup>

Some employers have also invested in the development of their workforces through longer-term workforce planning strategies. Longer-term strategies help to cultivate skills development cultures. Where these strategies align workforce capability to business strategy they become a major influence on the ability to achieve the goals of all business functions.

## Workforce development strategy cornerstones

- ▶ identifying changed/planned business directions including digital aspirations
- ▶ determining organisational readiness - the skills required to reach them
- ▶ the current workforce profile; assessing future talent gaps
- ▶ the plan to bridge the skills gaps to meet new necessary or emerging roles
- ▶ changes needed to the current learning and development approach
- ▶ continuous cycle of developing new skills; re-skilling
- ▶ transitioning of employees to new roles metrics and monitoring<sup>15</sup>

<sup>14</sup> Findings in Skilling: a national imperative, Australian Industry Group, 2018 and Workforce Development Needs Survey Report, Australian Industry Group, 2016.

<sup>15</sup> The essential components of a successful L&D Strategy, McKinsey, 2019.

These developments mean closer partnerships with education and training providers are needed to nurture links to online systems, to short courses and to flexible qualifications.

A company's workforce needs to be continually developed and engaged in order to support business goals. The test of strong workforce capability is the ability of leaders, managers and employees to innovate, design, absorb new knowledge, produce, improve and perform at a high level, all within a conducive, cooperative workplace culture.

The stories in this section represent companies that are likely to have planned learning and development strategies encompassing the whole workforce. They can recognise their skills profile and effectively target and construct teams for particular roles and agile projects.

Many of the companies that have introduced new technologies to remain competitive in the future environment, acknowledge that the process has been partnered by cultural change. In Ai Group's *The Fourth Industrial Revolution* report<sup>16</sup> member company Weir Minerals described its transformation into a new kind of industry expert developing disruptive digital platforms for the resources industry. However this required a significant cultural change in the company, necessitating new ways of listening to the market, developing products and services, re-organising internal processes, providing holistic solutions and delivering long term customer value.

Weir recruits employees with relevant skills sets utilising relationships with leading universities globally, however they also develop existing employees' skills through collaborative efforts between different teams. This contributes to a pipeline of hundreds of ideas.

The importance of digital learning and development systems, and embedding social platforms, to enable workforce strategies became crucial during COVID-19 restrictions. Many larger companies had already established their own learning platforms enabling employees to access learning, create and publish their own learning materials, courses and videos, and tag their learning to the company's skills and development goals. It is socially-led training but linked to the business strategy. Where smaller company resources do not stretch to implementing online learning development systems, external providers can be sought. These developments mean closer partnerships with education and training providers are needed to nurture links to online systems, to short courses and to flexible qualifications.

16 The Fourth Industrial Revolution, Australian Industry Group, 2019.

# BAE Systems Australia

Driving strategic alliances for innovative collaboration; establishing degree apprenticeships in Australia



BAE Systems Australia is a major supplier to the Australian Defence Force, with 4,550 employees and generating over \$1billion in revenue each year. Major contracts cover all three arms of Defence and include building the Hunter Class Frigates in Adelaide, maintaining the F-35 Joint Strike Fighter, upgrading the Jindalee Operational Radar Network, coordinating and managing the sustainment of Air Warfare Destroyers and supporting, maintaining and updating missile defence systems.

Due to programs ramping up and normal attrition, BAE expects to employ about 650 people into the business each year until 2024. The company is a major employer of people with STEM-related skills, with about 40 per cent of its workforce comprising engineers and about 20 per cent in trade occupations.

Because of its anticipated growth and its workforce composition, BAE is casting its net widely to attract people from a broad and diverse talent pool. This includes offering an inclusive workplace, flexible and part-time work arrangements (including trialling a 9 day working fortnight program), and continuous and on-demand learning. COVID-19 has also had an impact, with BAE supporting its workforce to transition to working from home full-time, providing COVID-19 special paid leave, and placing even more emphasis on work-life balance and workplace flexibility for the future.

Another outcome of this growth, and the move towards implementing Industry 4.0 digital technologies means BAE is seeking to establish strategic long-term alliances with education providers at all levels including universities, VET providers and schools. It is also establishing greater relationships with other businesses that see the need to develop new learning programs for their future workforces. This might include redeveloping trade training to include digitalisation skills or developing more flexible or blended courses that can be customised to suit growing employers.

An example of BAE's new training programs is running in the UK, involving 15 Degree Apprenticeships which combine the best of work-based learning, vocational and tertiary education. Participants are directly employed by BAE Systems whilst studying and finish with a Bachelor's Degree in their chosen field. In 2020, over 250 of the company's 800 apprentice recruits in the UK were in degree apprentice programs.

BAE Systems Australia is hoping that new partnerships with education providers and like-minded businesses will drive new innovations such as Degree Apprenticeships in Australia to help it meet its growing workforce requirements.



# HYDAC

## At the cutting edge of learning innovation with virtual reality

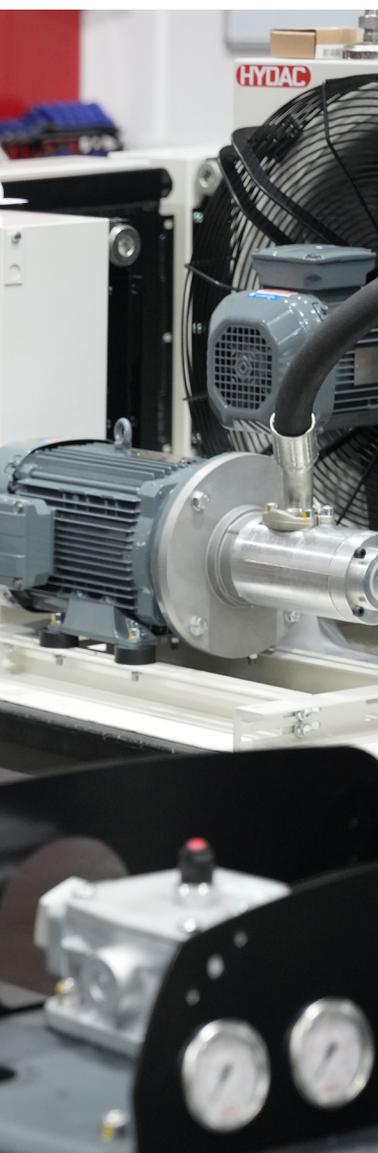
HYDAC International specialises in fluid technology, motion control and automation and operates in over 50 countries. HYDAC's Australian branch has partnered with Deakin Motion Lab, part of Deakin University, to develop a new and state-of-the-art virtual reality (VR) program in order to deliver remote training for both employees and students. The 2020 pandemic year provided a pressing opportunity for HYDAC to explore VR technology.



The cutting-edge technology allows for students and trainers to be in different locations and to come together in a virtual training space. It allows direct interaction with the equipment, real-time instruction, feedback and verification of skills. Students have their training experience in a total 3D environment; the training uniquely allows and simulates hazardous events that would be impossible to demonstrate safely in real life.

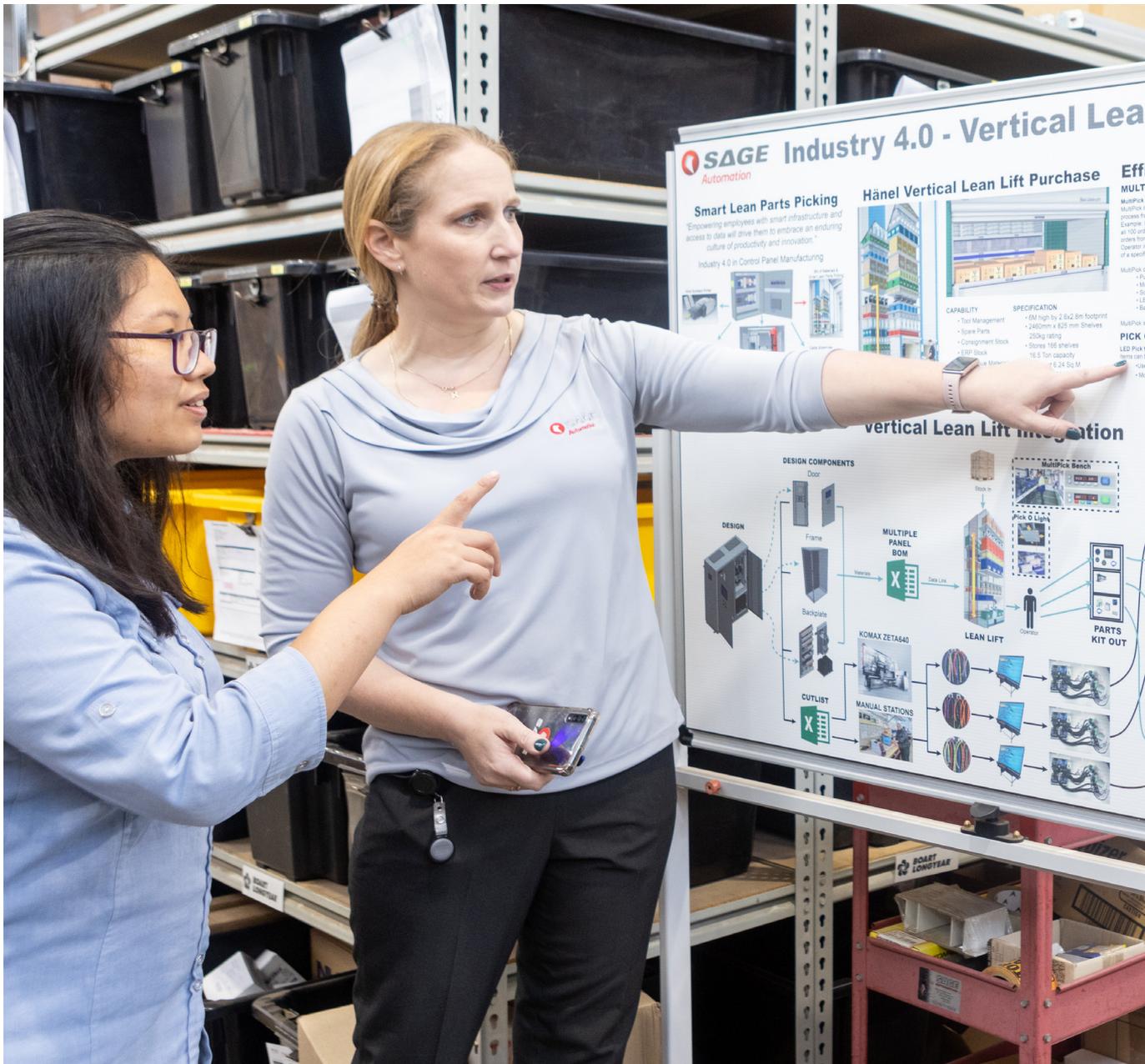
The topics in HYDAC's VR training are related to hydraulics, electro-hydraulics, hydro-pneumatic accumulators and thermal optimisation, with a focus on workplace safety. Students can also perform tasks as they would normally do if they were on the actual machine, such as changing a hydraulic filter and checking the pressure of a hydro-pneumatic accumulator; all with the full assistance of a professional qualified technical trainer.

The possibility to educate, teach new skills and verify safe working practices for workers at home or located in different geographical locations means training can continue and be improved despite distance. By preparing workers for new equipment, upskilling and skills refreshing for fly-in fly-out workers, with the HYDAC trainer located in one place, each student can access the training from almost anywhere. They can all meet and interact together in the same virtual environment, with the training experience made more exciting.



# SAGE Automation's Skills Lab

An industry-led, targeted approach prioritising hands-on learning, adaptation and collaboration



SAGE Automation is an engineering company which provides smart automation solutions focused on digital solutions, IoT and Industry 4.0. The company is 25 years old, has 14 offices in Australia and employs more than 470 people. It offers solutions to a range of different industries including defence, transport, resources, utilities, energy and manufacturing. It is based in the Tonsley Innovation Precinct in Adelaide, which aids collaboration with other companies and education institutions.

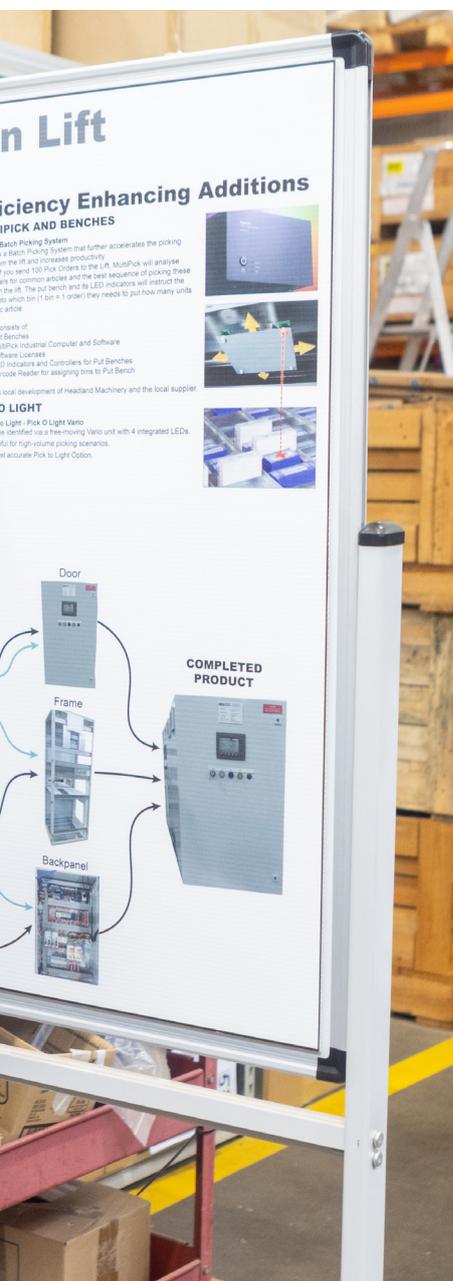
SAGE has realised the importance of providing high-quality learning to meet current and future industry needs. Skills Lab is a registered RTO that was created by SAGE to offer training solutions to meet industry needs. SAGE's training offerings developed over time from additional internal training to up-skill graduates from tertiary, to training for businesses and industry, to Skills Lab.

One key offering of Skills Lab is a new, digital engineering apprenticeship in collaboration with Ai Group, TAFE SA and Flinders University which aims to meet industry needs. The apprenticeship provides individuals with a combination of experience, skills and a nationally accredited Diploma of Applied Technologies. It meets the needs of 'high-touch' manufacturing occupations that will continue to grow, augmented by new technologies. Hands-on work experience alongside SAGE Group engineers and technicians also means that students are able to work with industry-leading technology and gain real-time experience in the workplace.

Another important aspect of SAGE's Skills Lab is the ability to quickly adapt training needs to keep up with the latest technologies. For example, Skills Lab is already changing components of their Diploma of Applied Technologies, despite it only being 12 months old. This ensures that graduates are receiving up-to-date training using leading technologies demanded by industry.

Hands-on industry experience also helps to address the issue of up-skilling in outdated technologies.

SAGE Automation's new approach to training exemplifies a more industry-led, targeted approach to learning which prioritises hands-on learning, adaptation and collaboration. This approach will become increasingly important as digital trends are accelerated, and demand for life-long learning and continuous up-skilling become more central.



# CV Services Group

## Comprehensive learning and development commitment from apprenticeships through to leaders

CV Services Group (CV) provides a complementary range of technical services across four businesses; Electrical Construction, Infrastructure Services, Asset Services, and Media & Signage. The company employs approximately 550 team members and has offices in Brisbane, Townsville, Gold Coast, Sunshine Coast, Sydney and Melbourne.

CV offers a range of apprenticeships across numerous trades including electrical, plumbing, fire, HVAC, carpentry, sign writing, digital print and sheet metal, and currently has over 100 apprentices who are undertaking a formal qualification. CV, in conjunction with RTOs, provides its apprentices with formal training and work experience with ample opportunity for growth and upskilling into their desired trade. The combined theoretical and practical training allows CV to develop a strong workforce with relevant, recognised skills and qualifications.

Electrical apprentices make up a significant portion of CV's apprentices due to the company's diverse electrical offering. Electrical apprentices are offered further development opportunities, including the potential to undertake a broader range of electrical training in a number of different areas including civil, construction and maintenance. The diversity of work allows apprentices to experience working for different teams and managers, as well as working in variety of environments, enabling them to further build their knowledge and skillset.

Further annual training is provided to all electrical workers within the company to assess their competency. The annual skills assessments utilise a custom training room complete with switchboards specifically designed to assess electrical workers' practical knowledge. The practical demonstration of CV's electrical team members' knowledge ensures that their skills and knowledge are up-to-date, and industry standards are maintained.

CV also offers internal training which provides team members with the leadership and managerial skills needed to effectively lead their teams. One of the types of training provided at CV is a Management Certificate Program, which includes a range of different modules designed specifically for up-skilling and educating team members on the CV way, including human resources and industrial relations, health and safety, performance management processes, as well as other processes, risks



and policies. Not only does this internal training provide individual team members with the opportunity to upskill within the business and take on new roles and increased responsibilities, this also ensures that team members have the right skills to excel in their role and provide their team with strong leadership and direction.

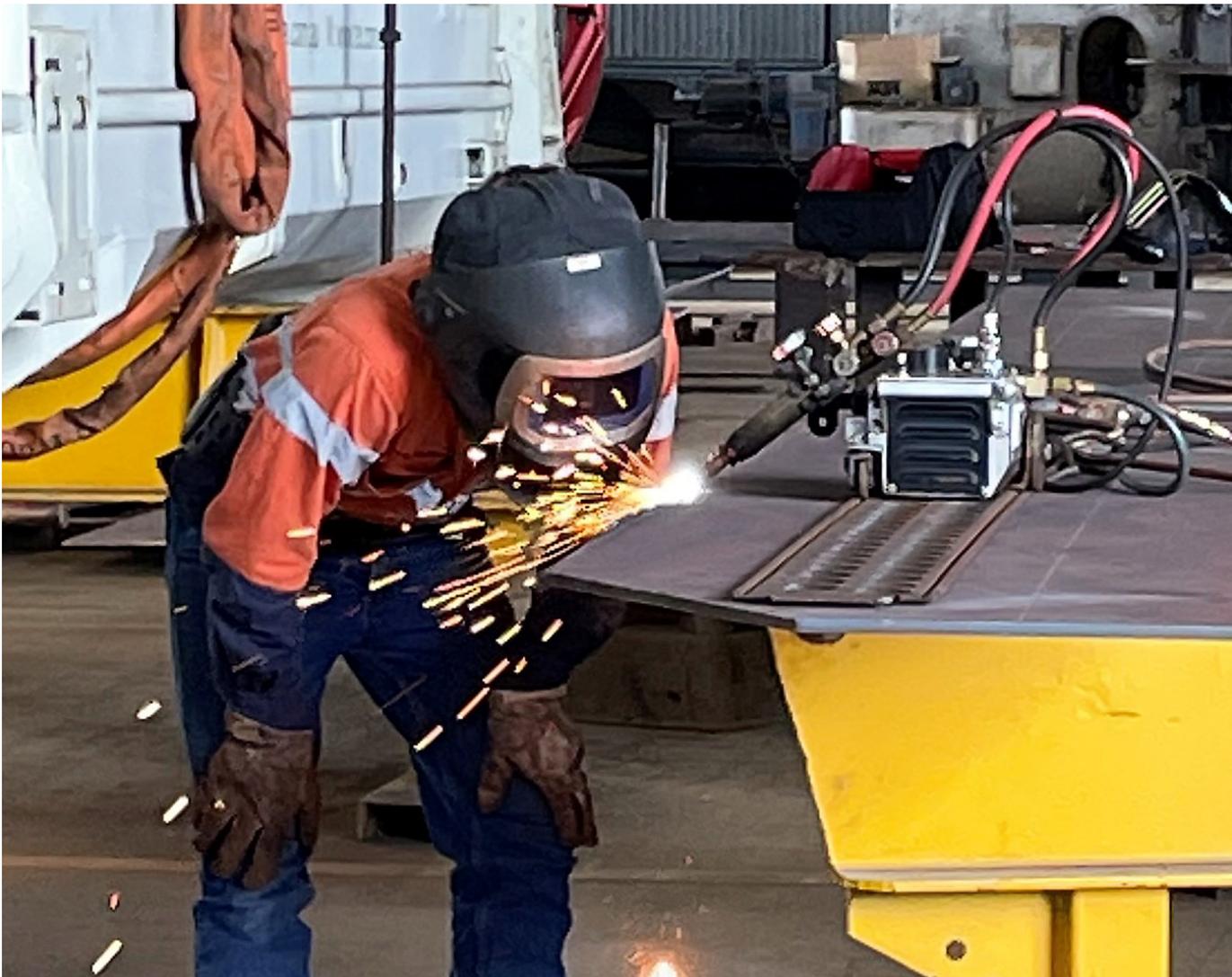
At CV, training is essential to develop the right team who can deliver the right outcomes for the business. This can be seen at apprentice level, all the way through to the leadership team. With the right training in place, CV benefits from a high level of team satisfaction which enables them to exceed expectations and provide a superior service to their clients.



# TEi Services

## Early engagement with school students pays off through committed apprentices

TEi Services is a manufacturing, engineering and construction company based in North Queensland that has operated for over 50 years. From humble beginnings as a small jobbing shop, it now delivers a diverse range of engineered solutions including large industrial structural projects, complex mechanical projects and transport assets, government and mining capital infrastructure and mineral processing equipment. The mining equipment is sold to a world market, predominately African miners.



With around 50 employees, TEi Services has a regular intake of apprentices, each year offering new places mainly for engineering trades in fabrication, fitting and machining.

Like many companies in the sector, TEi Services acknowledges that some occupations are difficult to recruit, but the company is proactive in finding solutions. It participates in training forums to help ensure that training content stays relevant to future needs; it introduces new initiatives and continues to train the current workforce.

TEi engages with apprentices early through school-based apprenticeships. It is strengthening relationships with schools and RTOs and has found by engaging with high school students that have decided to follow a VET pathway these apprentices complete at a high rate. Other initiatives include offering holiday work to interested students, engaging in work experience programmes, and engaging in apprenticeship swaps. This provides workshop trainees some experience in field maintenance and gives the guest trainee a look at workshop work.

When recruiting, TEi Services doesn't just focus on the skills it needs, because they are not always available in the right mix. The company looks for potential: the right attitude, such as turning up on time; buying into the company vision and policies; and demonstrating an eagerness to learn.

Recruitment focus is on the quality of the person and how that person will add to the culture. The company's experience is that skills can be added.

TEi Services believes that the pandemic has highlighted gaps in its skills needs, especially if it is to capitalise on potential opportunities that may arise if other companies re-shore or on-shore. There is an ongoing rapid change in the industry to new digitally controlled tools. These tools require people with the skills to interpret a drawing and digital skills to create the data files that the new tooling needs. And operators with an understanding for how the tools work will always be more successful. The industry also needs people with the skills to service and maintain these extremely complex tools.

TEi Services was an active user of the Technology Cadetship program when it was available and has recently embraced the new Industry 4.0 Higher Apprenticeship. This program is closely aligned to skills needed to work with advanced digital technologies, and is expected to increase the business' Industry 4.0 capabilities in automation and digitalisation of processes such as robotic welding and 3D metal printing. The first participants in the project are tradespeople already working in the business who are training to increase their skills, but future opportunities may be available for new apprentices when Industry 4.0 skills are included in entry-level apprenticeship programs.



# Agilent

'From industry's perspective we want young talent that we can grow'

Agilent Technologies is a global Scientific Measurement company. Its Australian operations develop Spectroscopy measurement instrumentation and are involved with Optics and Scientific Consumables manufacturing.



Agilent sees its success stemming from its people, offering structured development programs that provide the fuel to enable continued learning and growth, supported by internal mobility with global reach.

In Australia, Agilent has established a student scholarship program as one of its main recruiting strategies for young talent. This important pipeline of talent for Agilent has grown through its partnership with the Australian Computer Society Foundation (ACS F).

Every year Agilent recruits a cohort of around 10 Engineering and Science students as interns across the areas of Software, Mechanical, Mechatronics, Computer Science, Technical Services, Application Scientist and Field Service Engineering. Future scholarships are likely to include expanded fields such as Creative Coding and Digital Marketing. The interns are generally in their third or fourth year of study when they commence the 12-month program and are able to apply what they have learned to date in their degree program.

Agilent assists with establishing and documenting the objectives of the student's internship period; undertakes all induction and ongoing support; mentoring and growing the student's skills and experience; and evaluating the student's performance during that period. Where students have another year of study post the scholarship, Agilent often employs the students part time with the view to full time employment after completion of the degree.

Under the program, Agilent has found it benefits from being able to evaluate the interns over an extended period and to determine which students would be most suited to a position in their graduate program. The aim is to convert as many students as possible each year from the program to graduates in the company. The advantages are numerous including both graduates and Agilent being fully familiar, graduates understanding what it is like to work at Agilent, what their role will entail and the culture at Agilent. The company has an employee who can "hit the ground running", understanding their role and aligned with the company. These graduates are committed and loyal, productivity is excellent and graduate retention is high.

The ACS F coordinates and supports the process for the tax-free student scholarship. Agilent contributes an amount per year for each intern from which ACS F pays the majority to the intern on a regular basis via their university. The students receive 10 days sick leave and 20 days annual leave as part of their scholarship. Agilent also covers associated insurances.

Agilent sees this program as a key initiative to source and grow young student cohorts that can become immersed in the organisation's values and systems before they graduate. A recent move by Agilent has been to link the program with its strategic diversity goals. The program is now being used as a pipeline for female talent – aspiring to 50 per cent of female scholarships/internships.



# Australian Vinegar

## PhD research student helps create boutique vinegars using waste food and clever sciences

Australian Vinegar creates boutique vinegars using waste food and clever science. After successfully engaging a PhD student to assist with an important innovation, Australian Vinegar is an advocate for the significant role graduate students can play in solving companies' business problems. The researcher joined the company's fermentation scientists, exploring wasted hydrocarbons and turning them into either food, food ingredients or agricultural industrial chemicals using vegetables and fruit and juices that were destined for the ground. Australian Vinegar engaged the research scientist through an Entrepreneurs' Programme grant.

As industry adjusts from a COVID-19 environment and transforms, adopts advanced technologies and changes its work organisation, business problems will continue to arise and will need to be solved. Graduate researchers have long been a rich source of high-level knowledge and ideas for businesses needing solutions to both product/service ambitions and roadblocks. They possess the knowledge, intellectual abilities, techniques and professional standards to undertake new research that can assist companies within complex fields of learning. Their capabilities can enable them to work on and solve industry-defined problems or generate new knowledge that leads to innovation and commercial outcomes. They offer companies flexibility, with the potential to be involved through their entire candidature or for more discrete periods via a placement or internship.

Company involvement with graduate researchers can realise the additional benefits of providing access to academic supervisors with specialist knowledge; building talent pipelines; and attracting funding/scholarship options, rebates and tax concessions.

They possess the knowledge, intellectual abilities, techniques and professional standards to undertake new research that can assist companies within complex fields of learning.

These stories demonstrate that businesses are better able to grow and innovate in the midst of rapid change when workforce development is planned.

### Companies committed to this tend to:

- ▶ engender a culture of learning while working
- ▶ establish and use a learning management system to keep track of the organisation's unique skills pool
- ▶ implement a cycle of re-skilling, up-skilling and skills deepening
- ▶ provide options for learning to keep skills current in the workplace (mixes of face-to-face and remote learning, coaching, social learning platforms, cross-functional teamwork, agile processes and learner input to learning content)
- ▶ mix in-house training with programs developed and delivered by external providers, and co-designed where possible
- ▶ consider a combination of short courses, micro-credentials and full qualifications as needed by the organisation
- ▶ gain the right talent for the organisation by taking on new entrants as students through work-based learning models (apprentices, trainees, cadets and/or interns).

# 04

## Intensify change in the broad skill ecosystem

- ▶ New templates for partnerships
- ▶ Digital skills development with human capabilities
- ▶ A re-imagined apprenticeship system
- ▶ Work-based learning as a core principle in qualifications
- ▶ Flexible qualifications allowing short-form training

Solutions to skills pressures in the past have been long in the making: they often require changes to systems, funding, programs and pedagogies. Australia needs innovative shifts in policy and practice

The current, and likely accelerating, skills urgency is pointing to the need for new responses, new support and upscaled collaborations. The enormity of the change needed calls for efforts from all parties in Australia's broad skill ecosystem. There is a growing wave of recognition that to achieve the skills Australia needs, a combined effort between industry, government, education and training sectors and the community is an essential response. Upscaling must involve new ideas and solutions as well as speed.

In the past year, to bolster the economy during COVID-19, Australia has seen strong government support through labour market programs and free or low-cost training and shorter higher education certificates that develop skills for both individuals and businesses. Many companies, represented by the stories told in Section 3, are leading the way with a commitment to skill development initiatives. This is not enough to tackle the accelerating major shifts causing the skills urgency highlighted in this report. Solutions to skills pressures in the past have been long in the making: they often require changes to systems, funding, programs and pedagogies. Australia needs innovative shifts in policy and practice.

Future-focused education and training delivered with, and in, industry should be the overall goal. Building on progress already made in the following areas, we believe action must be more urgent and intensified.

## a. Partnerships: establish new templates

Embedding collaborative cultures for skills development will assist Australia's future success. BAE Systems Australia has recently circulated a Request for Information to other companies to collaborate on innovative education and training initiatives to nurture talent for their industry. The company is similarly working with universities and TAFEs to achieve these ends. Such collaborative activity now needs to be widespread, with support provided to smaller sized companies.

Organically designed, co-located industry/training sector hubs, physical or virtual should exist across the business landscape. Industry/training sector hubs are best if they are multi-partner – large and small companies, universities, TAFEs, schools, government - involving any or all of training, placements, projects, competitions, research/incubation and co-location. These collaborative industry-education sector metropolitan and regional hubs, like Centres of Vocational Excellence in Europe, develop strategies to meet local skill needs and assist large and small companies to create innovative solutions. The hubs would develop partnerships between industry-student-provider engagement models that foster and increase relationships, and result in industry-tuned workforce entrants. They could involve workforce boards to support creative challenges and organise rapid reskilling in specific locations and industries. Next generation

This initiative provides a critical opportunity to leverage cutting-edge innovations in automation, machine learning, and education in support of short-term, rapid-cycle skills training.

tech sector partnerships, work-based learning networks and/or pipeline partnerships could operate according to need.<sup>17</sup>

The idea of such hubs feeds into a broader re-thinking of the traditional education and training campus concept. The pandemic has precipitated education and training provider rationalisations in terms of space and the level of attraction to campuses, according to one report that focuses on the university sector.<sup>18</sup> Digital learning environments and online experiences have the potential to encourage connection, active participation and critical thinking; social media can emphasise discussion, openness and independent thought.<sup>19</sup>

Industry actors, CISCO and Optus, recognise that virtual learning platforms will contribute to increased accessibility, efficiency, and scale of in-demand skills training. They have recently established the National Industry Innovation Network to create a new model for collaborative research with universities in which they see new technologies driving remote collaboration in real-time virtual labs. This initiative provides a critical opportunity to leverage cutting-edge innovations in automation, machine learning, and education in support of short-term, rapid-cycle skills training.

## The future campus

- ▶ fewer people
- ▶ more automated and efficient
- ▶ more experiential and alive
- ▶ more porous boundaries to industry
- ▶ promotes health and wellbeing
- ▶ available to access specialist equipment such as labs<sup>20</sup>

17 Advancing innovation in work and learning, Strada Education Network newsletter, March 2021.

18 The Tipping Point for Digitisation of Education Campuses, VECTOR Consulting, November 2020.

19 Payne, A. L., Swinburne University of Technology, A lot of us can relate to struggling to keep on top of everything: this is what mature-age students need from online higher education, The Conversation, March 2021.

20 The Tipping Point for Digitisation of Education Campuses, op. cit.

‘As microcosms of cities, there is an exploration within universities of treating physical campuses as ‘living labs’. They will need to be more closely connected through incubators, commercial spaces, government agencies and student job ready industry connections.’

Intensified change should include the exploration of innovative tertiary education institutes that mix vocational and higher education where such combinations are needed. An example of this, the newly announced NSW Institute of Applied Technology, promises to fully integrate VET and higher education in a cohesive tertiary curriculum, providing students with access to industry representatives, and employers invited to deliver their own proprietary training.

The two sectors would better service the economy if a number of enduring sectoral issues were addressed. Tertiary education in Australia is characterised by a highly unbalanced binary model. While recognising the distinctive features of higher education and VET there is a need for a more coherent and connected tertiary education policy and equitable funding framework to be established. Until the two are regarded as two parts of an effective whole, the opportunity to capably equip learners for Australia's economy will not reach its potential.

New partnerships should be built across the tertiary education system. Ai Group has argued for a more coherent tertiary education system in Australia which drives a more effective overall policy direction and governance of the system. As part of this, consideration should be given to the formation of a central independent coordinating agency to provide common approaches across the sectors and levels of government. Again this agency would include key industry sectors.

Partnerships must also be scaled up between industry and government for a more effective skill ecosystem. Ai Group has continued to advocate for deeper industry engagement at a national system level within the VET sector through a national industry advisory body that provides industry leadership and policy guidance at this overarching level of the VET system. It would become part of formal governance arrangements and would comprise representatives of key industry and societal sectors to ensure the articulation of relevant views.

In manufacturing alone there is evidence of increased demand for interpersonal skills in job ads over the last five years

## b. Digital skills: broad development, integrated with human capabilities

While many employers took on new digital operations during COVID, fewer were venturing into more advanced technologies late in 2020 as they focussed on regenerating their businesses. Some companies are still lagging in terms of digital transformation.<sup>21</sup> Section 2 of this report includes the results from Ai Group's survey late in 2020 which found the digital skills employers most needed to increase were basic digital skills, cyber security and data analytics. Fewer said they required cloud computing, AI, augmented or virtual reality or blockchain. It is suggested this indicates many are yet to reach the stage of harnessing technologies together in an integrated and digitalised approach that captures wide-ranging digitalised capability needs: production technologies; 'design to operate' process flows; sourcing and procurement; asset management; finance; HR and payroll. Increasingly this will become an issue as the forced switch to digital operations will require deeper digital strategies and the capacity to adopt, and have employees engage with, more advanced technologies.

There has been a growing range of state and federal government initiatives around digital skills. Australia will benefit from a coordinated map that identifies the whole range of entry level and existing skill needs, qualification/course availability and gaps. However Ai Group emphasises incorporating human capabilities.<sup>22</sup> Employers demonstrate a growing need for human capabilities in the survey, most greatly for managers and professionals. In manufacturing alone there is evidence of increased demand for interpersonal skills in job ads over the last five years.<sup>23</sup> There is still a need to support the training of existing workers in companies to transition into roles impacted by rapid adoption of new technology and practices. The training should span basic digital skills, cyber security and data analytics, as well as adaptability, creativity and problem-solving skills to function in changing work environments.

## c. renew the apprenticeship system: central to skills development

The apprenticeship system needs to be seen as a central component in Australia's future growth. It is an effective vehicle for young people to enter or re-join the labour market, and is more critical in an environment of limited skilled migration. The Australian Government has provided solid support for the apprenticeship pipeline during the pandemic through its Boosting Apprenticeship Commencements subsidy. Moving forward the apprenticeship system will better serve the economy if it continues to be well-supported, broadened and available at higher levels.

21 The Fourth Industrial Revolution: Australian businesses in transition, 2019.

22 Transferable capabilities of adaptability, creativity, problem-solving, communication and initiative must be well incorporated with technical skills.

23 CSIRO Data61/Adzuna Australian Skills Dashboard.

Apprenticeships primarily exist at a Certificate III level, however the digital economy increasingly needs higher level skills incorporated into training for workers in these roles.

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The system must be supported to attract and retain more diverse cohorts including more female and indigenous young people. Renewed incentive rates should be applied to reflect the rising costs to employers of supervising and training apprentices. Other supports that could be introduced would focus on apprentice supervisor mentoring and workshops and targeted funding for Group Training Organisations to assist SMEs and disadvantaged groups to participate in the system.

Driven by the need for apprentice numbers to increase, the Australian Productivity Commission<sup>24</sup>, along with some state governments, has recommended that governments encourage non-apprenticeship pathways for trade skills to enable students to continue training and build skills for occupations with skills shortages. Ai Group believes the development of such pathways will require careful consideration to ensure good outcomes for employers and for those who choose these pathways. For example new trade qualifications will need to be designed for people without employment and relevant industrial awards may require rates for those with qualifications but no relevant work experience.

Apprenticeships primarily exist at a Certificate III level, however the digital economy increasingly needs higher level skills incorporated into training for workers in these roles. Ai Group undertook a pilot focused on high-level technical skills in engineering and digital technology, in partnership with Siemens and Swinburne University. This program trained higher apprentices in a Diploma and Associate Degree in Digital Technologies and the model is now being rolled out across Australia.

A broader range of new priority occupations should be identified for higher skill programs in order to increase participation. STEM skills and transferable skills can be developed through Diploma-level traineeships in technical occupations and management skills developed through Diplomas for para-professional occupations. One example is Ai Group's Victorian Government-funded Digital ICT Apprenticeships project which is securing trainees for employment in companies as they undertake Certificate IVs or Diplomas in ICT.

A broader range of new priority occupations should be identified for higher skill programs in order to increase participation.

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Different higher apprenticeship approaches have been implemented in the UK, France and the US. These approaches have the twin benefit of increasing the level of qualification awarded for apprenticeships as well as extending the scope to non-trade and more para-professional occupations. In the UK the higher apprenticeship framework covers qualifications in a wide range of occupations not usually associated with apprenticeships such as: accounting; advertising and marketing communications; banking; care leadership and management; construction management; facilities management; information security; legal services; life sciences; power engineering; and supply chain management.

There are challenges in making higher apprenticeships more broadly available. State Training Authorities currently recognise only VET-level qualifications as apprenticeships or traineeships and industrial awards generally do not make provision for them. This underscores the importance of national tertiary policy and funding coordination across the jurisdictions in overcoming challenges to roll out higher apprenticeships.

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24 National Agreement for Skills and Workforce Development Review, Productivity Commission Study Report, December, 2020.

Within the higher education sector the National Priorities and Industry Linkage Fund's brief to develop new higher education advanced apprenticeships will assist the needs of industry.

## d. Work-based learning: make it a core principle in qualifications

Work environments are now best served by learning that is connected to and closely reflects workplace skill needs.

Work-based learning should now be a consideration beyond apprenticeships and across more qualifications. If not purely employment-based, then the learning should include forms of work integrated learning (WIL). Work environments are now best served by learning that is connected to and closely reflects workplace skill needs. There is broad industry acknowledgement that exposure to authentic work environments is highly effective at increasing students' work readiness. The greatest barriers to engaging employers in the activities are a lack of time, limited resources and the capacity to supervise students.

Through its members, Ai Group sees many quality and innovative pockets of work-based learning and WIL both in higher education and VET where formal education and training is augmented in the workplace, over time, by other skilled workers. A few examples include Ai Group's involvement with a Defence SA program which is matching student interns with companies in the Defence supply chain; and Ai Group members TEi, a Townsville SME manufacturer taking on higher apprentices in applied technologies; Agilent with its enduring IT scholarship program for students in order to nurture new talent; and BAE establishing its own Degree Apprenticeships in Australia.

Section 2 of this report reported that 80 per cent of respondents to Ai Group's 2020 skills survey would take on higher apprentices, cadets or interns in order to increase their employees' skill levels. Half of these employers said they could do it only with government support. Tangible action here would be the take up by the federal government of the national cadetship proposal for VET and university students proposed by the Mitchell Institute. The proposal suggests apprenticeship-style subsidies for employers to take on students at scale using existing system infrastructure.

The NPILF promises to focus WIL activity. However without industry incentives, currently included only as a range of options in the Appendix of the NPILF Final Report, increased uptake by employers will be more limited. Employers' increased engagement also needs to be supported by access to innovative WIL models that expose students to contemporary practices. Innovative WIL models enable different levels of capacity to engage and encourage expanded activity from a range of businesses, particularly small to medium enterprises.

Support for up-scaled WIL connections between employers and research graduates is also needed to assist with research and development collaboration. As a Program Steering Committee member of the Australian Postgraduate Research Intern program (APR.Intern), Ai Group is aware of the successful outcomes for companies involved with this

The demand from industry for readily available, short form training reflects various re-skilling and up-skilling needs primarily arising as a result of increasing digital transformation.

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Qualifications need to be designed differently, combined differently and be accessible across contexts in many more varied and timely ways.

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program. It connects PhD students with industry through short-term internships across all sectors, disciplines and universities. It links businesses with fresh ideas to innovate and provides pathways for universities to expand research collaborations. Currently funded by the Australian Government's Department of Education and Training, and run by the Australian Mathematical Sciences Institute (AMSI), the renewal and national expansion of this program should be explored.

## e. Flexible qualifications: incorporate the shorter form training needed by companies.

Industry needs flexibility and speed from the education and training sector as it races to reskill and upskill. As industry has moved through the COVID-19 environment, focussed training programs that were aligned with specific work opportunities have been crucial. The demand from industry for readily available, short form training reflects various re-skilling and up-skilling needs primarily arising as a result of increasing digital transformation. The crisis identified the need for short courses at a number of different AQF levels; it has highlighted the need for access to information on offerings for the public; for coherence in offerings; and for information on where credentials sit/how they stack in relation to specific qualifications.

The education and training sector should be cognisant of an increasing number of initiatives by large companies that by-pass the formal system and implement company specific competency frameworks and digital learning development systems. Companies are embedding social platforms so that training is social and community led. This allows them to meet their specific organisational needs and offer their own training for existing workers and new entrants. They are using micro-credentials, digital badges, e-portfolios and open source learning platforms. Section 3 of this report found that companies are mainly interested in offering short courses over the next 12 months and a greater percentage intend to use private or in-house providers rather than TAFEs or universities (unless investing in formal qualifications in which case a much greater use of TAFEs and private RTOs is intended).

Qualifications need to be designed differently, combined differently and be accessible across contexts in many more varied and timely ways. This questions funding models, the role of institutions and the relationship between learning and credentialing. Moving into the future Australia needs a coherent framework of micro and longer credentials, adaptable by industry and individuals, underpinned by a modern qualifications framework, and which better connects the tertiary education sectors.

It is essential that the government-accepted recommendations of the Australian Qualifications Framework Review are progressed quickly to bed down the re-imagining of qualifications. They need to be able to support and build upon the dynamic and fluid combination of skills and knowledge. Qualifications will also not necessarily be assembled hierarchically.

Individuals will access qualifications and skill sets over their working life to meet the demands for critical reskilling and upskilling.

Ideally qualifications under the new framework will be designed and developed in a way that organises knowledge and skills and that enables individuals to gain, retain or build upon meaningful work. They would have a purposeful balance between technical and generic skills, and knowledge, all of which could be developed through an engaging applied learning pedagogy. They could be completed in entirety or accessed via meaningful groupings or skill sets allowing for shorter forms of training/ micro-credentials to be brought together in a qualification linked to an occupation or a career.

Ai Group's new Centre for Education and Training will nurture new levels of engagement across the broad skill ecosystem to encourage progress against the actions outlined in this section.

Our Centre will explore new ways of building skills and capabilities for companies and individuals to succeed now and into the future.

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