The Future of Work in Queensland to 2030

Evolution or revolution?
Discussion paper

Jobs Queensland

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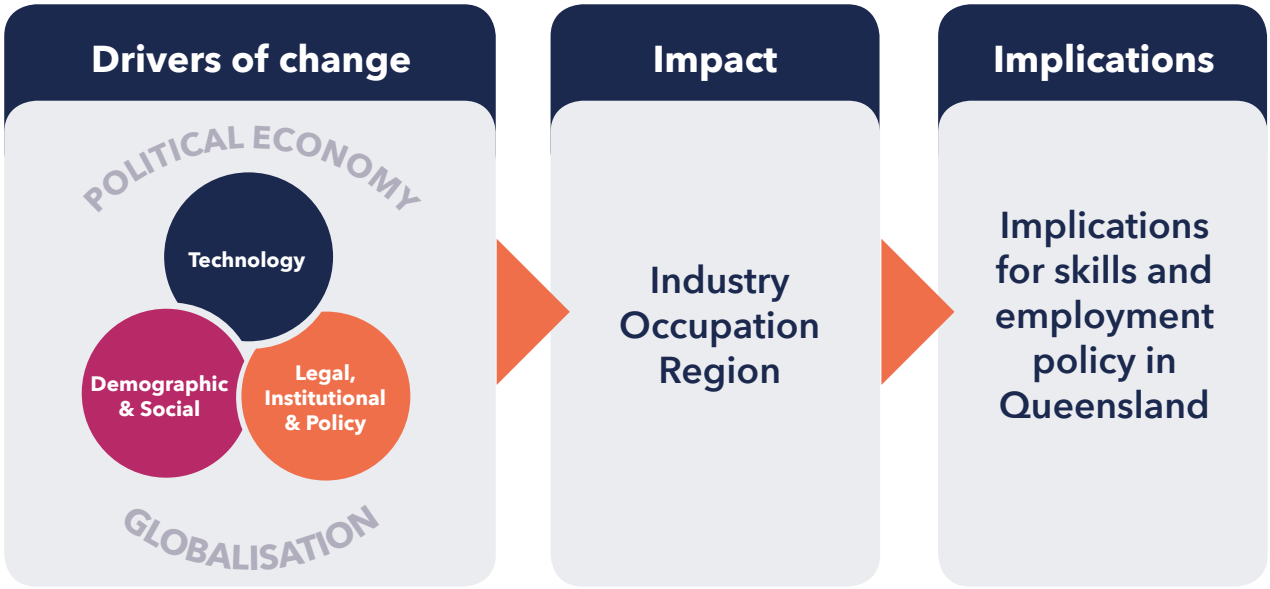
SUMMARY

Jobs Queensland was established by the Queensland Government as a statutory entity to provide independent strategic advice on future skills requirements, workforce planning and development issues and apprenticeships and traineeships. The Honourable Shannon Fentiman, Minister for Employment and Small Business and Minister for Training and Skills Development has requested Jobs Queensland explore the future of work and the possible implications for employment and skills policy within Queensland.

As Queensland moves further into the 21st century, differing viewpoints are emerging on the future of work. New contributions to the debate are published on an almost daily basis by academics, governments, think tanks, not-for-profits and the corporate sector alike. A range of views are being presented. Some are highly optimistic – 'technology will solve all our problems' and others highly pessimistic – 'robots are going to take our jobs'. The work that Jobs Queensland has undertaken to date suggests that the subject is more complex.

While technology is considered by many as the major factor influencing the future of work and the workforce, it is but one of three drivers of change. These three drivers comprise technology impacts; demographic and social changes; and legal, institutional and policy influences (Figure 1). The environment in which these drivers interact is often referred to as the 'political economy'. Globalisation, another theme also discussed widely in the associated literature, is both cause and effect of these three drivers.

Figure 1: Factors influencing the future of work in Queensland



The Queensland economy is diverse – while mining has been a key driver behind our recent economic prosperity, many other industries such as tourism, health, construction and manufacturing continue to make significant contributions to both output and employment. These economic contributions also characterise our regional areas, with many distinct regional economies located across the State.

Unlike the majority of Australia, our residents are dispersed throughout Queensland, with around half of the population residing outside the Greater Brisbane area. This is reflective of the history and economic potential of our regions. Migration, from interstate and overseas, has also been vital to the prosperity and diversity of our State and its regional areas.

The Jobs Queensland *Future of Work* project commenced with a literature review of credible research to highlight a range of opinions to sharpen our collective focus, identify opportunities for future workplaces and workforces and consider the implications for employment and skills policy. A wealth of national and international literature and projections about the future of work and the future workforce of 2030 was identified. The review identified points of consensus, difference and information gaps, including that there is limited research that is specific to Queensland. The literature review is available via the Jobs Queensland website. A summary of its findings is presented in the next section of this paper.

This discussion paper draws on the key findings of the literature review and provides analysis and commentary on the changes that have occurred and are projected to occur in the Queensland economy and workforce. Its purpose is to provide a Queensland context and highlight where evidence is scarce for the conversations that will inform and drive future policy advice around employment and skills development.

Next steps

In the next phase of this project, Jobs Queensland will be undertaking further work (conducted in parallel) consisting of:

- Consultations with stakeholders across Queensland to further investigate the issues and assumptions identified in this discussion paper. This will explore possible implications for employment and skills policy in Queensland to ensure that employers and workers are equipped to provide/participate in 'quality' work.[1]
- A social research project to better understand how work is changing for Queenslanders and the impacts that this is having on work arrangements and engagement with alternate work arrangements such as platform-based ('gig') employment.

A report on phase two activities and interim recommendations will be completed by mid-2019. Outcomes from phase two will also inform further work focused on deeper research into specific issues identified through prior activities. A final report will be delivered in December 2019. Figure 2 illustrates the phases of the project.

Figure 2: Future of Work project phases

1. Quality work is defined as 'the extent to which a set of job attributes contributes to, or detracts from, workers' wellbeing in their work and non-work domains' (Burgess, Connell and Dockery, 2013, *Quality of Work Research Project Report*, Curtin University).

CONSULTATION

How to have your say

Workshops

A number of workshops will be held across Queensland. A webinar will also be held.
For workshop details and to register to attend, visit www.jobsqueensland.qld.gov.au/projects/future-of-work/

Written submissions

You can provide a written submission considering the themes below or addressing any of the consultation questions. For more information on making a submission, visit www.jobsqueensland.qld.gov.au/projects/future-of-work/

Consultation questions

Technology impacts

1. How do we identify and prepare for change associated with the impact of new technologies?
2. What will government, industries, employers and workers need to prepare for and adapt to this change?
3. What is the role of government in relation to the adoption/uptake of technology? For example: accelerate, regulate or non-intervention?

Demographic and social changes

4. How do we promote equality through supporting people, especially those most at risk, to engage, stay engaged or re-engage with the labour force and/or education and training?
5. How do we prepare Queenslanders for the predicted departure from a traditional and linear working life, made up of education, followed by a career and then retirement?
6. How do we support employers in responding to potential transitions within their industry, including their workforces?

Legal, institutional and policy influences

7. How prevalent are "new" work arrangements enabled by digital technologies (e.g. gig/platform-mediated work) in the Queensland economy?
8. What is the role of institutions (government, vocational education and training, etc.) in the process of transition?

Training and skills

9. How do we identify and develop the new skills that are needed?
10. How do we develop the workforce of the future if we don't yet know what skills and knowledge the workforce will need?
11. How do we transition the workforce of today to the workforce of the future?
12. What skills, knowledge and attributes will employers and the labour force (both new entrants and existing workers) need to succeed in this changing environment?
    a. How do we recognise skills and knowledge gained through non-formal/non-accredited training and learning?
    b. What is the role of modularised training/microcredentialling/nano-degrees?
13. What is the role of the VET system now and in the future in developing new and existing workers in the labour force? And how will it need to change/adapt to meet the needs of consumers in the changing work environment?

FINDINGS FROM THE LITERATURE

The literature review that informed this paper looked at the impacts of three drivers of change on national and global economies:

- technology impacts
- demographic and social changes
- legal, institutional and policy influences.

Globalisation is also an important element, as both an influence towards and the outcome of changes from these three drivers. It has been, and still remains, an overarching driver of change in work and the demand for skills (Australian Industry Group [AiG], 2016; Becker, Bradley and Smidt, 2015; Dolphin, 2015). Globalisation creates structural change not only in industries but also in regions as the industrial composition of a region changes in response to changing global consumer demand. This impacts the social structure of the region as well as its demographic composition as people move into or out of a region in response (Jones and Tee, 2017; Aither, 2014).

The impact of globalisation is expected to increase as digital technologies increasingly enable the movement of labour virtually (Baldwin, 2018). We are seeing teleworking becoming mainstream – the rise of the 'digital nomad' where a person can work from anywhere in the world and contingent employment models (Roos and Shroff, 2017). These changes will influence where we work, how we work and when we work, with some commentators predicting the "rise of the individual" who will drive future employment models (Deloitte, 2018; KPMG, 2013).

The industries experiencing the most growth are service industries, segments of which traditionally offer lower skilled, lower paid, part-time and casualised employment. Even in the professional, scientific and technical services sector, a high skilled and high wage employment sector, the rise of the gig economy is argued to be impacting the quality of work available (Australian Council of Trade Unions, 2018).

The major driver of this change is often thought to be the uptake of digital technologies. Frey and Osborne (2013), with their focus on the impact of technology on jobs, forecast mass unemployment by 2030. Their modelling was based on consideration of the impact of technology on whole jobs. More recent research recognises that a job is made up of a series of tasks requiring a range of skills. This suggests that the impact of technology is most likely to be at task level (Nedelkoska and Quintini, 2018; αlphaβeta, 2017). Depending on the number of tasks that could potentially be automated, a small proportion of jobs may become obsolete. Importantly, all jobs will potentially be impacted at some level and workers will need the skills gained through a lifelong learning mindset to meet changing job demands (AiG, 2016).

Technology-driven change is not new. Predictions that technology will make humans redundant have been made since the start of the Industrial Revolution in the 1800s (Lawlor and Tovey, 2011; Boreham, Parker, Thompson and Hall, 2008). To date these predictions haven't come true, and there is no evidence that this time will be any different. In the past, major technological advances have led to increased productivity and improved quality of life as difficult and dangerous tasks were no longer performed by humans. Recent research acknowledges that technology is not the only driver to impact the future of work. Harris, Kimson and Schwedel (2018) identified that demographics and society also will influence how work looks by 2030.

In the last 100 years the global population has almost quadrupled (Goldin, 2016). Together with a proliferation of new technologies, these factors are driving changes in the economic and industrial composition of nations. Australia is not immune to these changes. As with many developed countries:

- Our population is ageing (Balliester and Elsheikhi, 2018; Becker et al., 2015).
- Women are entering the workforce in increasing numbers and are better educated than at any other time in history (Australian Institute of Health and Welfare, 2018).
- Young people are staying in education longer and acquiring higher levels of education (Australian Bureau of Statistics [ABS], 2017).
- Young people, Aboriginal and Torres Strait Islander peoples and people with disabilities are experiencing above average levels of underemployment and/or unemployment (Lowe, 2018; OECD, 2018a).
- Many people from migrant and refugee backgrounds are not having their skills recognised or fully utilised within employment (Deloitte Access Economics, 2018).

The combination of an ageing workforce and the entrance of post-millennials from 2019 will for the first time see five generations in the workplace (Select Committee on the Future of Work and Workers, 2018). This will bring greater diversity of age and experiences to enterprise, driving the need for employers and organisations to develop and utilise skills to engage and manage such diversity.

What does this all mean for employment and skills?

New technologies will see jobs change, some significantly, as tasks within them are substituted by autonomous processes. This will change the skills that a person requires, either to remain employed within the same organisation, or to transition to new employment which may be in another industry. Increasingly, workers will also require the skills needed to work collaboratively with technology and/or to adjust to changing employment circumstances. This will drive the need for ongoing reskilling and upskilling (AiG, 2016).

The increasing longevity of the population will mean that people will be working longer (Gratton and Scott, 2016). Education and training institutions will need to address not only the needs of learners transitioning from school to work, they will also need to support existing workers and those being impacted through industry transitions to identify and acquire the skills and knowledge required to remain engaged in work. Rapidly changing skills needs within enterprises will drive demand for access to modularised training delivered onsite to meet the needs of the enterprise and workforce.

These trends will drive the need for lifelong learning across the workforce regardless of age or time in the workforce. Continually evolving skill requirements and changing industry profiles within the economy will require policies and institutional responses to address potential economic and social inequality which may be exacerbated by geographical location, ethnicity and/or educational access.

It will also see people entering and exiting the workforce at multiple points (Buchanan, Verma, and Yu, 2014) or seeking alternate work arrangements that meet their lifestyle requirements (Manyika, Lund, Chui, Bughin, Woetzel, Batra, Ko and Sanghvi, 2017; Roos, 2017; AiG, 2016). This is bringing into question the long-held concept of a "standard employee relationship"[2] (Stanford, 2017).

2. The standard employment relationship (SER) is defined as one in which workers "work for just one employer, year-round, usually on a full-time basis, on the employer's premises, and utilising capital equipment supplied by the employer" (Stanford, 2017, pg. 9).

The demand for access to education and training throughout the life span will drive the need to consider alternate delivery models. This may be online by virtual classrooms, face-to-face outside of 'normal' delivery hours, onsite at a workplace or a combination of methods. Already we are seeing the increasing uptake of massive open online courses (MOOCs) which offer the learner opportunity to undertake short courses specific to their interest (often for free).

These changes are also impacting our public institutions (government, education and training, regulatory bodies) as they grapple with the potential implications of the drivers not just for work but also for society more broadly. Questions are already being asked around what role these institutions have played and will need to play in ensuring both the workforce of the future and a fair and equitable society.

Points of consensus and difference in the literature

The literature review found that there is general agreement across the published literature in this field:

- Change is not new – what is new is who will be impacted and the extent of the impact.
  - The literature suggests that the impact will be felt by those holding some form of post-secondary qualification.
- Key structural and economic reforms in Australia over the last 40 years have changed our labour market.
  - Part-time work is increasing and other forms of work arrangements enabled by digital technologies are appearing (e.g. teleworking, contracting).
- Work is changing as a result of both technology and demographic and social changes.
  - Technology is replacing dull, dangerous and repetitious work enabling workers to engage in higher skilled and more satisfying work.
  - Older workers are staying in the workforce for longer.
- There is growing consensus that the impact on jobs will be largely at task level.
  - Technology will increasingly replace routine cognitive tasks within jobs, freeing up workers to engage in increasing complex and more satisfying work.
- Employers will need support to respond to transitions within their industry, including their workforces.
  - 2019 will see five generations entering workplaces for the first time.
- Queenslanders will need to be prepared for the predicted departure from the 'traditional three-stage' working life[3].
  - As people live longer, they will increasingly move in and out of the workforce and education and training, changing jobs and careers frequently.
- Participation in lifelong learning will be key as jobs and workplaces are transformed by the drivers shaping the Queensland economy.
  - New models and modes of learning will be needed to support an increasingly age-diverse student body.
- People, especially those most at risk of disruption to their employment, will need support to engage, stay engaged or to re-engage with the labour force and/or education and training.
  - Early implementation of support strategies for those at risk is key to maintaining engagement (Jobs Queensland, 2018d).
- Collaboration across all institutions (education and training, government, employment and society) is needed to ensure a high skilled and adaptive workforce.
- We are not powerless in shaping our own futures.

3. School, work, retirement (Gratton and Scott, 2016).

There are also some areas of contention and points of difference in the literature, including:

- How and to what extent modes of employment are changing.
  - While there is increasing agreement that work is being changed at a task level, there is little consensus on which jobs will be changed and to what extent.
- Definitions (e.g. worker/employee) are contested, resulting in anxiety and confusion.
  - There is little agreement in the literature on a number of terms used to describe modern working arrangements which makes measuring the impact of the identified drivers difficult.
- The extent and speed of the impact of new technologies such as artificial intelligence (AI) and machine learning (ML) on work and workplaces.
  - Both AI and ML are predicted to have significant impacts on the future of work. However, both technologies are still under development and commercialisation may take significant time.
- The impact and the extent of impact of new technologies on employment and productivity both in the short-, medium- and longer-term.
  - Predicting the future is always difficult. Historical patterns of technological impacts provide some guidance. Lack of agreement over whether this time is different is also confusing reliability of predictions.
- The extent to which inequality is rising in Australia (and Queensland) and how changes in technology and the broader economy will affect this predicted trajectory.
  - Inequality can be both real and perceived. There are numerous factors which can impact on inequality (real or perceived).
- How technology and the move towards a more knowledge- and service-based economy will affect regional and remote areas.
  - The impact of technology and the changing industrial profile of regional and remote areas is predicted to be either an opportunity or a threat according to the literature.
- The skills, knowledge and attributes needed for the future.
  - There is agreement on some skills for the future (such as language, literacy, numeracy and digital literacy). However, other skills are not so clear possibly due to the language being used (e.g. 21st century skills, adaptive skills) and questions around the delivery and assessment of such skills.
- The role of vocational education and training (VET) is unclear.
  - While the literature is clear that VET will play a large part in providing the workforce of the future, there is a lack of consensus around the role of the institution of VET (i.e. provider of skilled workers for industry or supporting learners to develop the skills needed for both work and life) or the structure of the system (e.g. full qualifications v modularised training).

THE QUEENSLAND CONTEXT

While there is a wealth of national and international literature on the future of work, there is much less literature that is specific to Queensland.

Historically, economic change has not been uniform in either speed or scope. Who will be impacted, how and what roles will change, and the extent of the impact is hard to predict. Queensland faces many of the same issues that are impacting global economies: accelerating uptake of digital technologies; changing demographic and social profiles; low wage and productivity growth; and perceived growing inequality.

Through our work with industry and regions, Jobs Queensland has seen how Queensland's industries and regions are changing. The impact of digital technologies and involvement in global value chains are driving changes in workforce composition and skills.

Understanding the Queensland context will be key to identifying solutions and planning for an inclusive future for all Queenslanders. Notable features of the Queensland economy include:

- large number of regional centres with distinct economies and communities
- large proportion of small businesses
- lower ratio of persons with post-secondary educational qualifications (rapidly catching up to the national average)
- lower ratio of persons employed in professional occupations
- lower ratio of digital literacy capabilities and slower technology take-up.

There are many areas where data is unavailable or visibility is unclear, including take-up of new modes of learning, alternate modes of employment and the 'gig' economy.

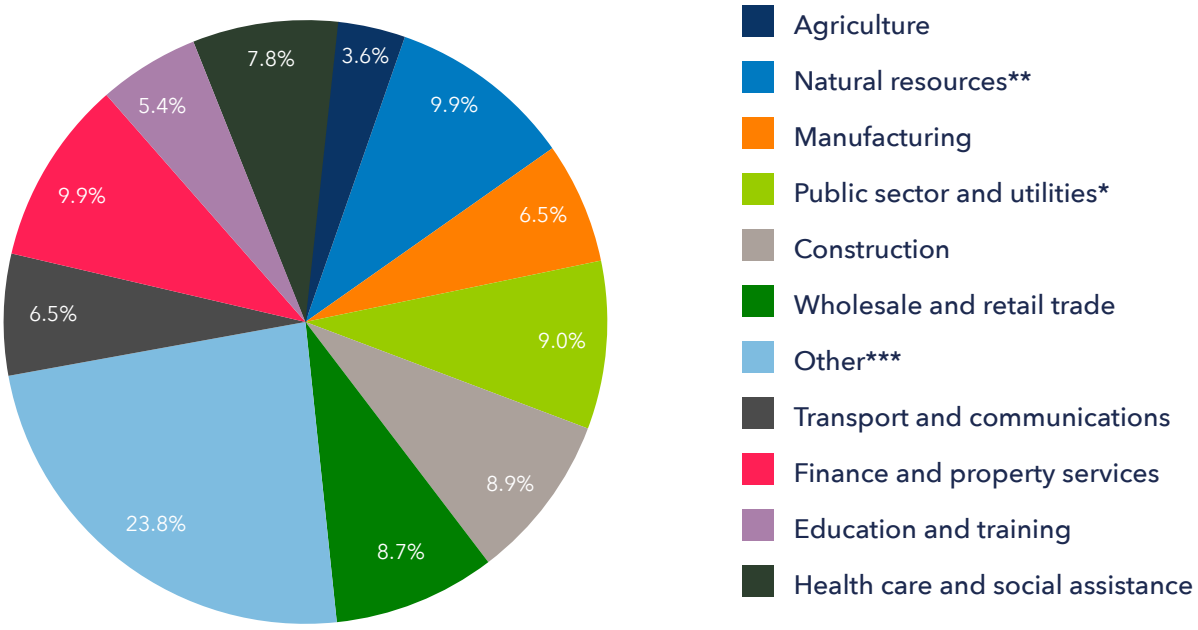
Queensland's economy is changing

Queensland has a vibrant and diverse industry profile. Figure 3 shows that many sectors make an important contribution towards our economic output (Queensland Treasury Corporation, n.d.). This diversity is one of the keys to the ongoing resilience of Queensland's economy.

Reflecting Queensland's diverse economic profile, our regions are also diverse hubs of economic importance. Queensland has a number of regions which are significant hubs for various industries. For example, Mackay is a significant hub for the resources industry, in particular the coal mining sector. Gladstone, also a hub for the resources industry, is a key centre for the gas sector. Other significant regional hubs include Ipswich for manufacturing, Townsville for defence, Cairns for tourism and Stanthorpe for the wine industry. This diversity of our regions contributes to the uniqueness of our state economy.

The Queensland economy is not immune to the economic, technological, social and institutional shifts occurring nationally and internationally. Already we are seeing the transition to a knowledge- and services-based economy. According to the CSIRO (Hajkowicz, Neale, Cameron, Horton, Naughtin, Bratanova and Sauer, 2018), while mining remains one of our biggest economic contributor in terms of output, service industries such as construction, health care and social assistance now contribute almost as much. These changes are also impacting our regions. Regional workforce plans undertaken by Jobs Queensland (Jobs Queensland, 2018c, 2018e, 2018f) have highlighted some of the changes currently being experienced in regional areas.

Figure 3: Queensland economic contribution by sector



*Public sector and utilities includes: public administration and safety; and electricity, gas, water, waste services.
** Natural resources includes: the extraction of naturally occurring mineral solids, such as coal and ores; liquid minerals, such as crude petroleum; and gases, such as natural gas.
***Other includes: dwellings; professional, scientific and technical services, accommodation and food services; other services; administrative and support services; arts and recreation.
2016-17, Gross Value Added, current prices

Source: Queensland Treasury Corporation, n.d.

New technologies are playing a part in the restructuring of the Queensland economy and benefitting industries in a variety of ways. While technological change may create some disruption, it also brings opportunities. For regional centres, becoming a technology hub brings increased business opportunities and new industries (such as renewable energy), driving increased employment and the demand for highly skilled workers. Access to supporting infrastructure such as reliable internet will be key to enabling regional and remote areas to take advantage of these opportunities.

The workforce of the future will require higher levels of skills and different skill sets. Work undertaken by Jobs Queensland (2018b) with the manufacturing industry identified that this industry is already transitioning to a more highly skilled and knowledge-based workforce. Industry 4.0 – a term used to describe this transition within manufacturing – is increasingly being applied to other industries as technology drives changes in business processes.

Future opportunities for growth are being explored through the $650 million Advance Queensland suite of initiatives. Roadmaps have been developed for new and emerging industries such as biotechnology and aerospace as well as traditional industries such as mining equipment, technology and services (METS) and agriculture and food (Advance Queensland, 2018). These roadmaps highlight the opportunities technology is providing for Queensland's future.

There are also future opportunities arising from the changing nature of Queensland's export trade profile. In the past ten years, Queensland's export value has increased by 30 per cent (Hajkowicz, et al., 2018). China is now our largest trading partner, providing 31 per cent of our export earnings in the year ending September 2018, while south-east Asian countries such as Vietnam, Indonesia and Malaysia are also fast becoming important trade partners (Table 1) (Queensland Government Statistician's Office [QGSO], 2018b).

Table 1: Queensland exports by country, year ending September 2018

Rank (change)	Country	Sep 18	Annual change	
		$m	$m	%
1 (–)	China	24,063.4	4449.7	22.7
2 (–)	Japan	23,085.7	1098.0	10.0
3 (–)	India	9,956.3	-181.7	-1.8
4 (–)	Korea, Republic of	8,412.3	10.3	0.1
5 (–)	Taiwan	3,111.3	227.0	7.9
6 (–)	Netherlands	1,741.4	-215.4	-11.0
7 (–)	United States of America	1,542.7	-245.2	-13.7
8 (▲)	Vietnam	1,376.2	313.9	29.5
9 (▲)	Indonesia	1,319.4	262.4	24.8
10 (▲)	Malaysia	1,244.0	533.9	75.2
	Other countries	12,758.2	-285.7	-2.2
	Total all countries	77,611.0	5,967.2	8.3

Source: Queensland Government Statistician's Office, 2018b.

Small business is a significant contributor to the Australian economy accounting for 97.5 per cent of total businesses in 2016-17 (ABS, 2018a). This is a major point of difference compared to other economies in the OECD area (OECD, 2017).[4] It is also a key feature of the Queensland economy (Jobs Queensland 2018a), with almost 20 per cent of Australia's small businesses (including sole operators) located within Queensland[5] (ABS, 2018a).

The Office of Small Business (2017) states that 97 per cent of all Queensland businesses are small businesses and they employ 43 per cent of Queensland's private sector workforce. In 2015-16, small businesses contributed around $110 billion to Queensland's gross state product. Two thirds of small business owners hold a post-school qualification. While Queensland's small businesses make a considerable contribution to Queensland's economic success, they typically face global competition, have low adoption of technologies and shorter life spans than medium to large sized businesses (ABS, 2018a).

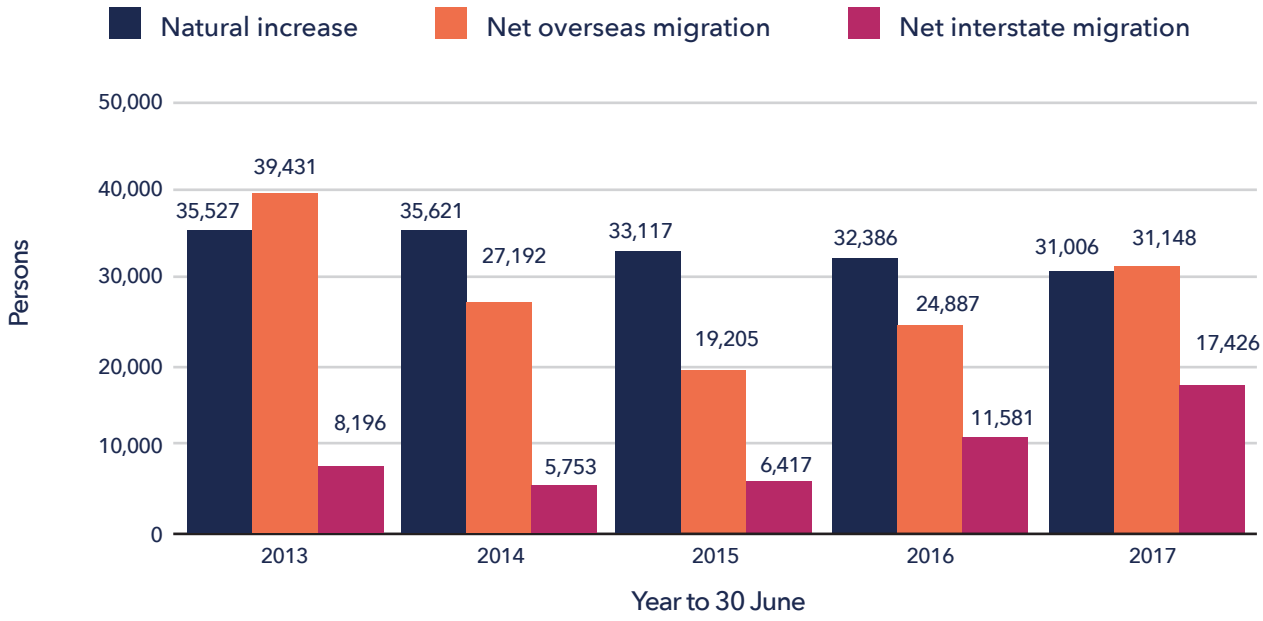
Population

The demographic profile of Queensland is also changing. Queensland's population grew by over 20 per cent from 2006 to 2016 (ABS, 2016). By 2031 it is expected that the Queensland population will increase by a further 28 per cent (QGSO, 2018d).

4. According to the Australian Bureau of Statistics a small business is one that employs less than twenty people.
5. As at June 2017 there were a total of 2,182,084 businesses that employed less than twenty people, of which 426,647 were based in Queensland.

An important part of this growth in our population has been, and will continue to be, migration from both interstate and overseas. This currently accounts for around half of Queensland's population growth (Figure 4) (QGSO, 2018c). Migration has particularly been important for Queensland's regional areas in addressing both skills shortages and increasingly ageing demographic profiles (Regional Australia Institute, 2018).

Figure 4: Components of population change, Queensland, five years to 2016-17



Source: Queensland Government Statistician's Office, 2018c – licensed and adapted under CC BY 4.0.

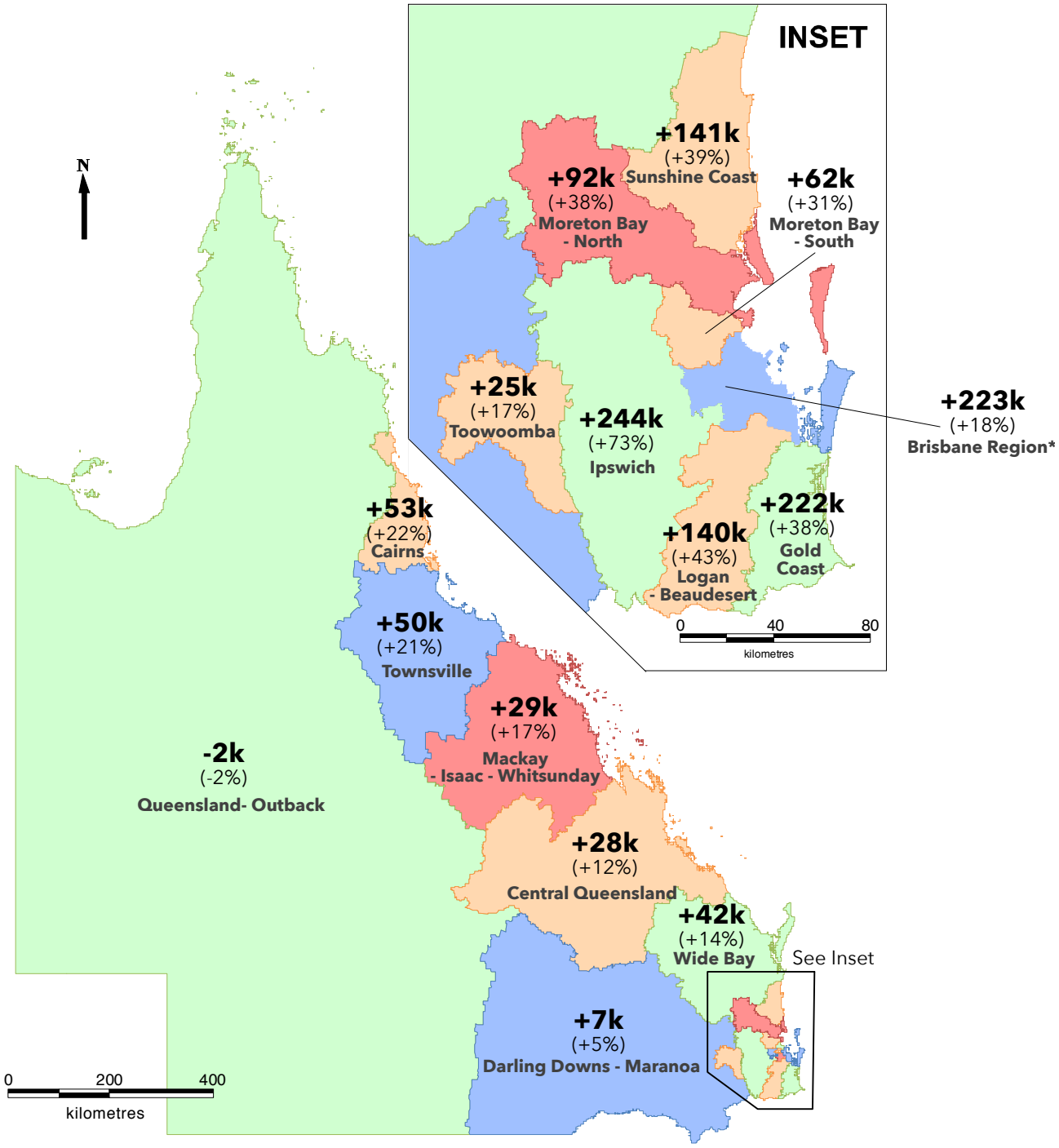
While demographically the state is younger than the Australian average (ABS, 2016), Queensland will undergo a transition towards a more aged demographic over the coming years. This is despite the fact that new migrants (who will drive our population growth) on average are typically younger than the resident population (Lowe, 2018). The proportion of people in Queensland aged over 65 years is projected to increase from 14.7 per cent in 2016 to 19.2 per cent by 2031, with a corresponding decline in the proportion of working age persons aged 15-64 from 65.6 per cent to 62.5 per cent (QGSO, 2018d).

As Queensland's population begins to age, it could be assumed that the proportion of people participating in the labour force might decline. Various societal factors along with the continued intake of working age migrants may mitigate the effects of ageing on the labour supply.

More than half of Queensland's population lives outside the greater metropolitan area of Brisbane (Queensland Government, 2017). Aside from the enviable lifestyle that the many regions of Queensland offer, the geographical spread in our state's population is primarily reflective of our diverse economic profile.

Current projections show that while various regions of Queensland are expected to grow at a greater rate than the State overall to 2031, the majority of the increase in our state's population is projected to occur within south-east Queensland, as depicted in Figure 5.

Figure 5: Growth in regional population (persons), Queensland SA4 regions, 2016 to 2031



Note: In each 'region' the values shown are number of persons (top) and % growth (bottom in brackets)
Source: Queensland Government Statistician's Office, 2018a – licensed and adapted under CC BY 4.0.

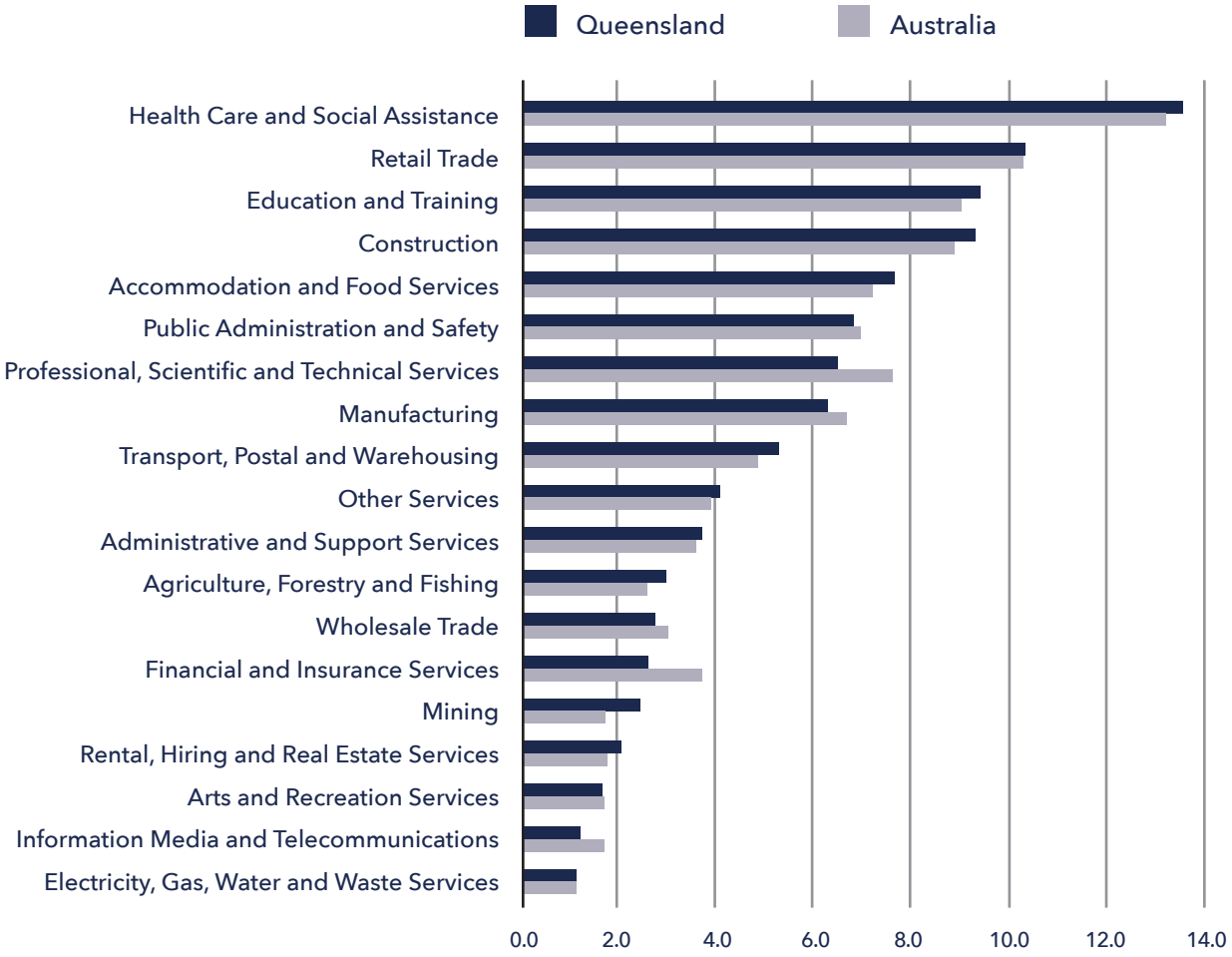
Queensland's workforce is changing

Together, the changing nature of our economy and population has influenced the nature of employment and the workforce more broadly in Queensland.[6]

Industries

The economic diversity of Queensland is reflected in the composition of industry employment within the State[7] which has been changing over the past decade. In 2016, the Health Care and Social Assistance industry was the largest employer, employing nearly 14 per cent of Queensland's labour force. Retail Trade, Education and Training, Construction, and Accommodation and Food Services made up the top five employing industries, reflecting Queensland's shift to a more services-based economy (Figure 6). The high proportion of employment in Retail Trade and Accommodation and Food Services is also reflective of Queensland's strong tourism industry.[8]

Figure 6: Industry employment composition (%), Queensland and Australia, 2016



Source: Australian Bureau of Statistics, 2016, Time series profile – T34 – licensed and adapted under CC BY 4.0.

6. There have also been many important social changes affecting employment and the workforce that will be briefly discussed later in this section.
7. It is important to note that economic contribution does not necessarily reflect employment within that industry, and vice versa.
8. Tourism is not listed as a discrete industry in the Australian and New Zealand Standard Industrial Classification and encompasses multiple industries.

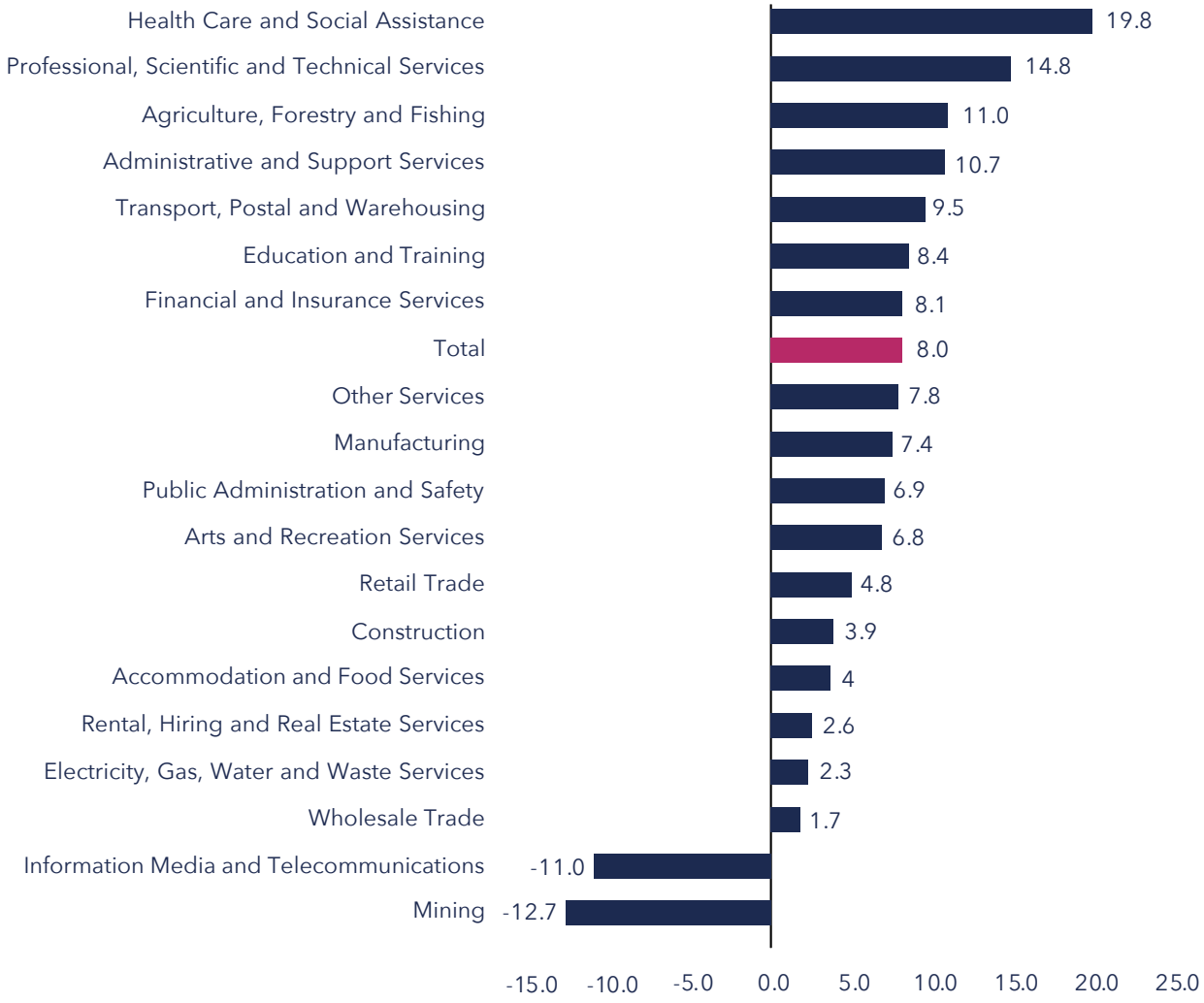
Figure 7 shows growth in employment by each industry in Queensland and Australia from 2006 to 2016. Mining has seen the greatest growth in employment, largely on the back of the mining boom that occurred during this period. Other than the Mining sector, employment growth over the ten years to 2016 was largely concentrated in the services and knowledge-based industries. Health Care and Social Assistance and Education and Training, both population-servicing industries, have seen strong employment growth at a level greater than Australia more broadly. While Manufacturing employment in Queensland has declined, the industry remains a significant employer (Figures 6 and 7).

Figure 7: Industry employment growth (%), Queensland and Australia, 2006-2016

Source: Australian Bureau of Statistics, 2016, Time series profile – T34 – licensed and adapted under CC BY 4.0.

Jobs Queensland (2018a) has undertaken scenario planning and economic modelling to project employment in Queensland out to 2022. Baseline scenario results, based on 2017 labour market, population and economic data and the Queensland Government's 2017-18 Budget papers, found that by 2022 more than 50 per cent of all new workers in Queensland are projected to be employed in just three industries – Health Care and Social Assistance; Professional, Scientific and Technical Services; and Education and Training. Figure 8 shows the projected growth in industry employment under this baseline scenario.

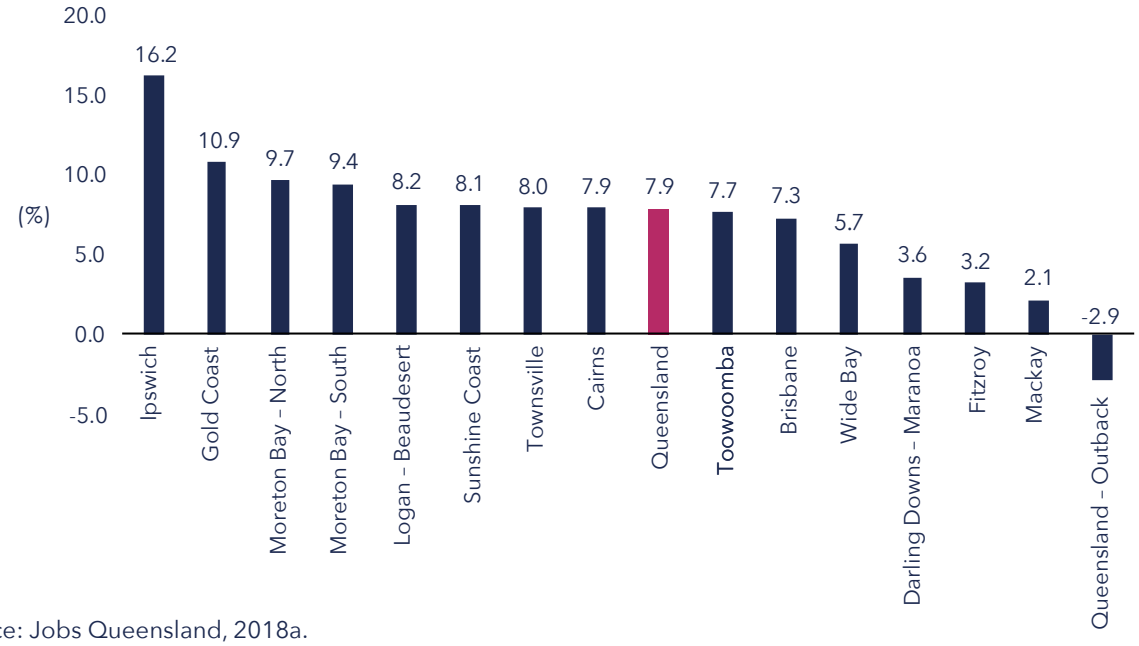
Figure 8: Industry employment growth between 2017 and 2022 (%), Queensland, baseline scenario



Source: Jobs Queensland, 2018a, pg. 14.

Baseline scenario projections at a regional level, which are closely related to the industry presence within those regions, are shown in Figure 9. It is projected that regions with the highest proportion of service industries will generally see the greatest growth in employment, with the highest rates of growth occurring in the south-east corner of the state (Jobs Queensland, 2018a).

Figure 9: Regional employment growth between 2017 and 2022 (%), Queensland, baseline scenario



Source: Jobs Queensland, 2018a.

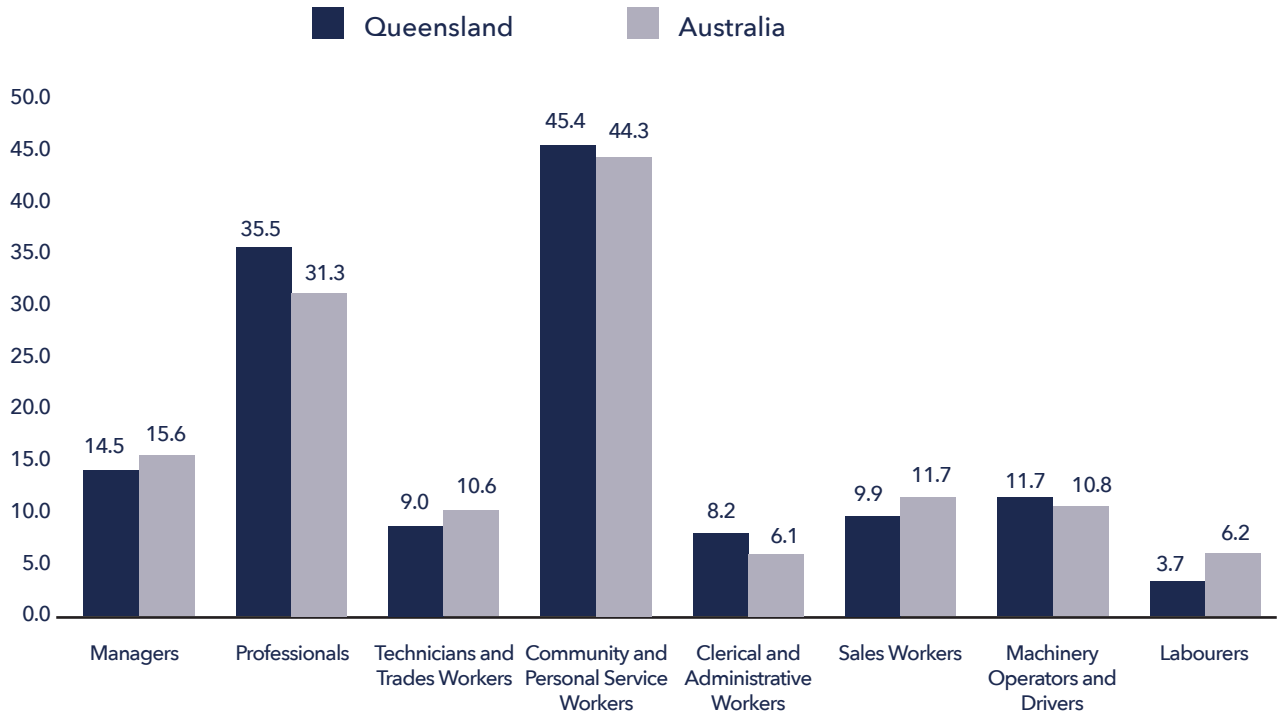
Occupations

As the Queensland economy becomes more knowledge- and services-oriented, the mix of occupations also changes, including within industries.

Work undertaken by Jobs Queensland (2018b) with Queensland's manufacturing industry has highlighted the transitions that manufacturing occupations are undergoing on the journey to Industry 4.0. Increasingly, manufacturing employers are looking for engineers, designers, IT professionals, etc. and opportunities to upskill their existing workforce to meet current and future needs. For example, consider the impact that the introduction of modern machinery had on the traditional engineering trades. These occupations did not disappear but became trades often requiring new skills such as programming and design (Jobs Queensland, 2018b).

Figure 10 shows growth in employment by each occupation in Queensland and Australia from 2006 to 2016. Similar to the observed industry trend, the changing occupational composition of employment in Queensland is indicative of a move towards a knowledge- and services-based economy, with significant growth in the Professionals and Community and Personal Service Workers occupations, which is proportionally higher than that of Australia more broadly (ABS, 2016).

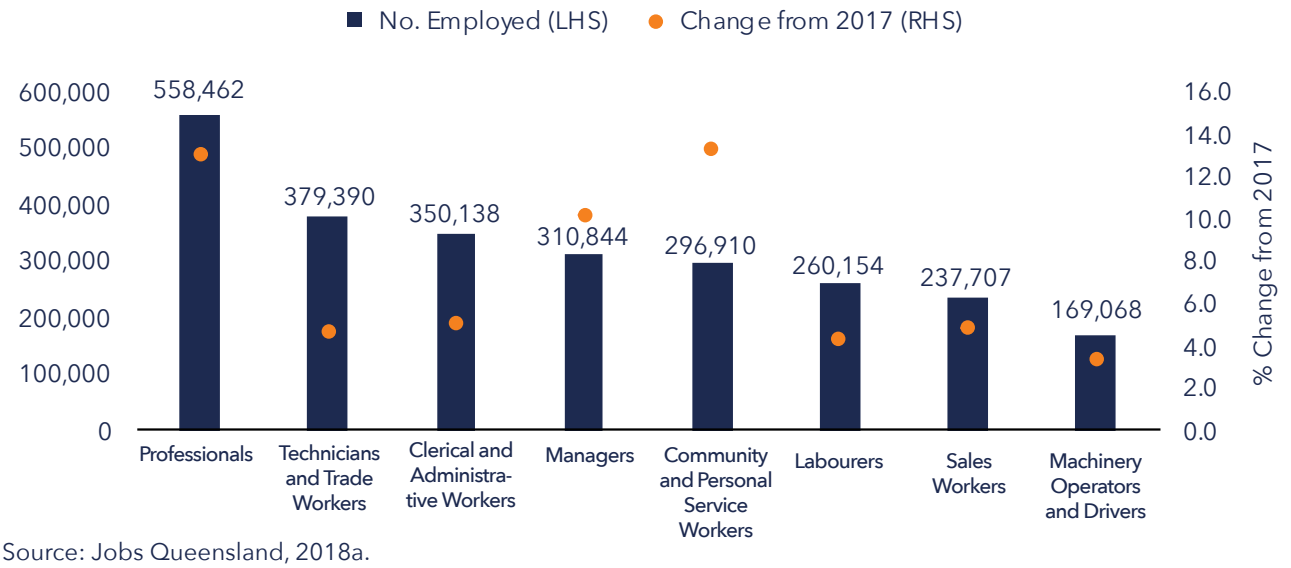
Figure 10: Occupational employment change (%), Queensland and Australia, 2006-2016



Source: Australian Bureau of Statistics, 2016, Time series profile – T35 – licensed and adapted under CC BY 4.0.

Under baseline scenario projections from the Jobs Queensland Anticipating Future Skills project (Jobs Queensland, 2018a), the current growth in the Professionals and Community and Personal Service Workers occupations is expected to continue to 2022 (Figure 11).

Figure 11: Occupation employment in 2022 and growth since 2017 (%), Queensland, baseline scenario



Source: Jobs Queensland, 2018a.

With the number of knowledge- and services-based jobs projected to grow in Queensland, the nature of occupations and work more generally will also evolve. Jobs Queensland (2017a, 2018a) identified that traditional entry level jobs are changing with diminishing need for routine tasks and an increasing growth in entry level jobs in the health and caring sectors. Many entry level roles are now requiring post-school skills, knowledge and experience (Foundation for Young Australians [FYA], 2018).

Labour market

As industry and occupational employment has changed, so too has the composition of the labour force and the arrangements under which people are employed.

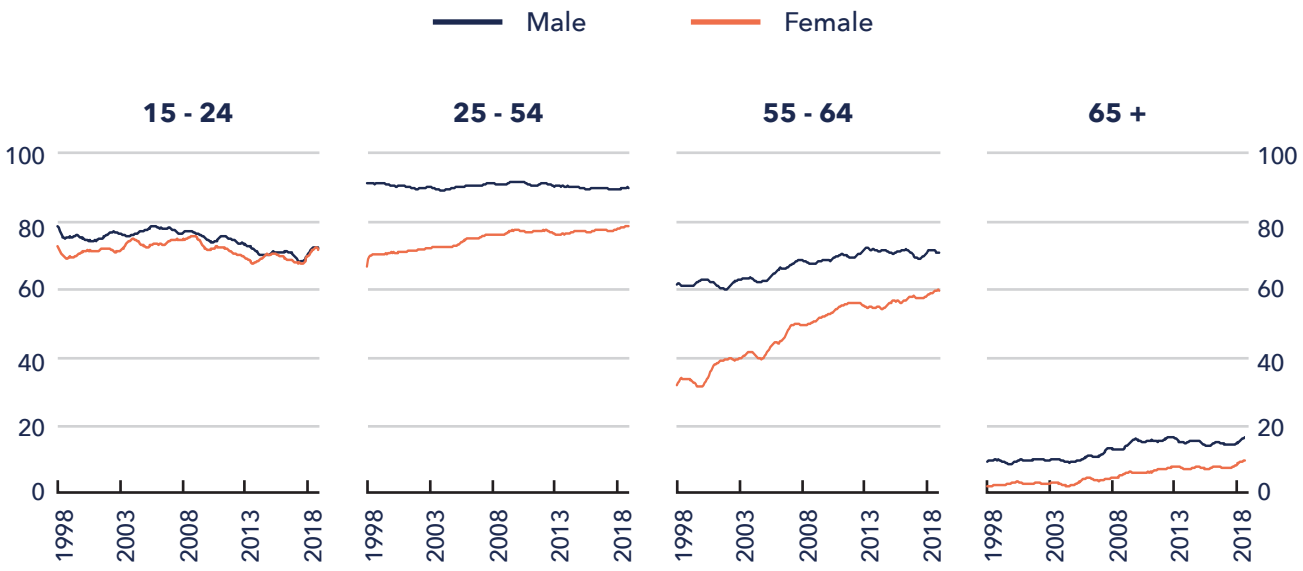
Figure 12 shows changes in the participation rate of the various age groups that comprise the Queensland labour force. Over the past two decades, there have been incremental but notable changes in labour market participation reflective of a variety of demographic and social influences (ABS, 2018d).

Increasing participation rates for mature age workers are attributable to improved health outcomes, changes in the nature of work, retirement income policies and the financial considerations of a longer life. This is expected to increase as people remain in the workforce longer (Lowe, 2018). Longer times spent by younger Queenslanders in education has influenced their participation in the labour market over the last decade (ABS, 2017), as has difficulties in securing entry-level employment (FYA, 2018).

For example, through work with the tourism industry in Queensland, Jobs Queensland found that the need to engage mature-age workers will become increasingly important for the industry as the available labour pool decreases due to competition with other industries. Many of these workers will have significant skills and life experiences which may require employers to rethink their employment strategies and conditions (Jobs Queensland, 2017b).

The increased labour market participation of women has been assisted by policy changes related to parental leave and child care, changing societal attitudes and educational attainment, and the increased prevalence of flexible and part-time work opportunities (Lowe, 2018; Australian Treasury, 2015). It is important to note that women are over-represented in some industries (e.g. health care and social assistance) and under-represented in others (e.g. mining). Three out of ten Queensland independent contractors are women and over a third of enterprises in Queensland are run by women (Department of Child Safety, Youth and Women, 2017).

Figure 12: Labour force participation by age and gender (%)*, Queensland, 1998-2018

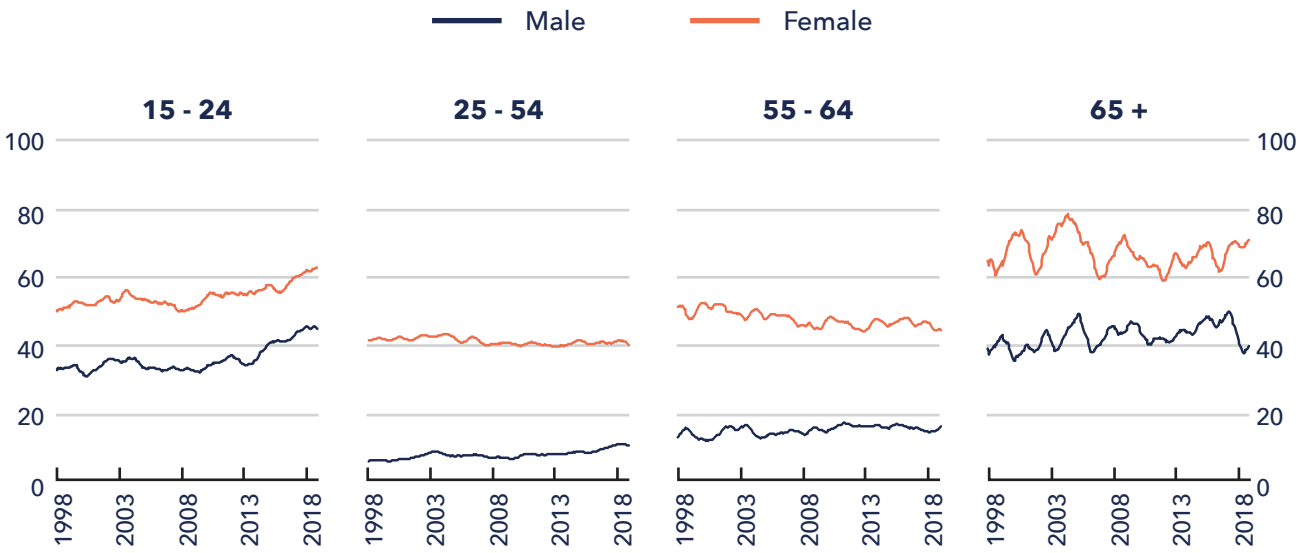


*12-month moving average
Source: Australian Bureau of Statistics, 2018d – licensed and adapted under CC BY 4.0.

During the 1980s, part-time opportunities allowed many women to enter the workforce. Today, part-time work still represents a significant portion of female employment in Queensland. A higher proportion of women are employed under this arrangement than men across all age groups (Figure 13). There has also been an increase in part-time employment of workers aged 15-24 years since 2013, which occurred around the same period that labour market participation decreased for this age group (ABS, 2018d).

The prevalence of part-time work remains a contentious labour market issue for many reasons. On the one hand, increased levels of part-time work could be indicative of underemployment. On the other, part-time employment may be a choice for many people for a variety of reasons such as caring responsibilities, study commitments or a preference for non-full-time work (Cassells, Duncan, Mavisakalyan, Phillimore, Seymour and Tarverdi, 2018). The social research project to be undertaken by Jobs Queensland in early 2019 aims to explore this further.

Figure 13: Part-time employment by age and gender (%)*, Queensland, 1998-2018



*12-month moving average
Source: Australian Bureau of Statistics, 2018d – licensed and adapted under CC BY 4.0.

Another contentious labour market issue relates to casualised and/or precarious employment. Some commentators argue that casual employment and precarious employment are one and the same. There are differing views on 'precariousness' of employment. Foster and Guttmann (2018) reported that even workers in permanent, full-time employment with all entitlements under employment law perceived their employment to be precarious due to changing business conditions. Other authors report high levels of satisfaction with the flexibility that casual and/or contract-based employment provides (Cassidy and Parsons, 2017).

Due to issues with measurement and subsequent concerns around the reliability of existing data, it is difficult to gauge the extent and impacts of such employment. Lass and Wooden (2017) attempt to identify the rates of employment types in Australia while noting the different figures attained depending on the data and definitions used. For instance, using Household, Income and Labour Dynamics in Australia (HILDA) data, this study identified that 19 per cent of workers were in casual employment; this increased to 26 per cent using ABS data.

The gig economy is considered by many commentators to be a contributor to this issue. Again there are differing views on the size and composition of the gig economy in Australia. Empirical evidence is limited and contested due to difficulties in relation to both definition and measurement. Both precarious work and the gig economy in Queensland will be explored through Jobs Queensland's social research project.

Nevertheless, existing data provides some insight into such labour market issues. Underutilisation[9] is persistent within the labour force data, suggesting excess capacity in the labour market. This is despite the increasing amount of hours worked by the labour force overall. Around one-quarter of part-time workers in Australia are actively looking to work more hours than they currently do. On average they are seeking to work an extra two days a week (Debelle, 2018).

Some groups within the labour force are more impacted by underutilisation than others. Over the past decade, there has been a rise in the share of underemployed younger workers who are willing and able to work extra hours (Dhillon and Cassidy, 2018). Recent work by Deloitte Access Economics (2018) highlighted the economic impact to Queensland as a result of the underutilisation of the skills of migrants and refugees. Indigenous Queenslanders are also a group whose skills and knowledge are often underutilised in the labour force. While measures of underutilisation and unemployment often follow similar trends, since 2008 the gap between them has been widening (Figure 14).

Figure 14: Underutilisation rate (%)*, Queensland, 1998-2018

*Trend measure
Source: Australian Bureau of Statistics, 2018c, Table 23 – licensed and adapted under CC BY 4.0.

9. Underutilisation encapsulates the extent to which people's desire for work is not being met, including persons who are not working but want to work, and those who are working but want to work more.

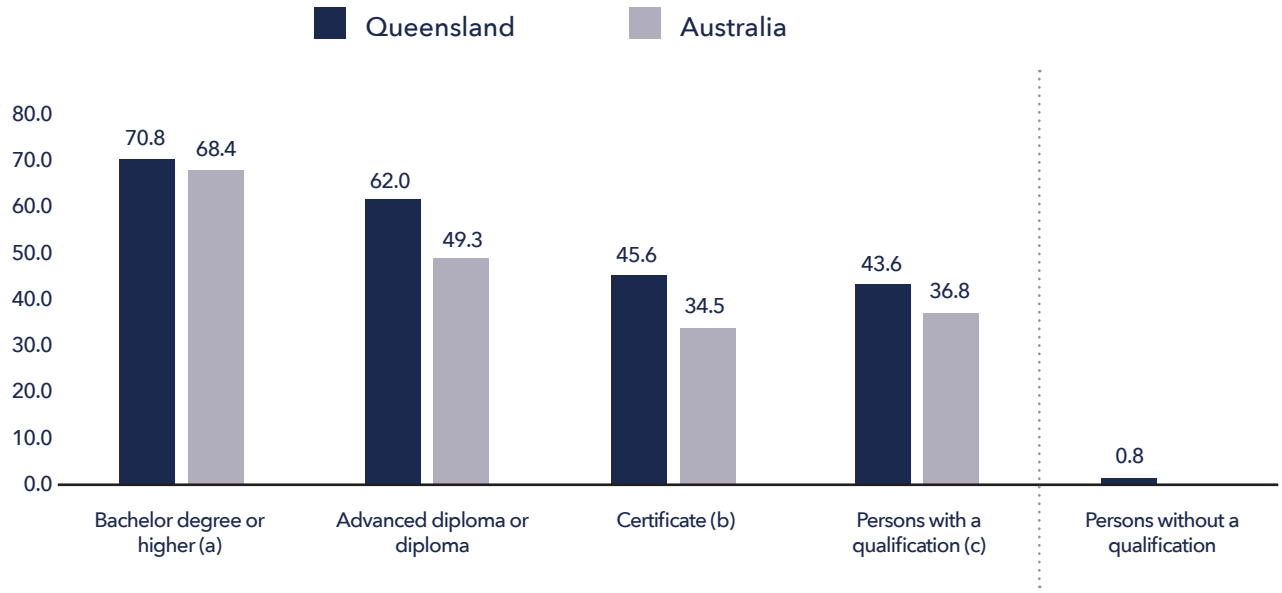
Education and skills

To take advantage of the opportunities arising from Queensland's transitioning economy, a high skilled and knowledgeable workforce is required. This requires more than just the acquisition of knowledge and skills. A workforce also needs the ability to mobilise knowledge, skills, attitudes and values to meet complex demands in an ever-changing and globalised environment (OECD, 2018b).

Our educational profile is already changing, with the number of people in Queensland holding a post-school qualification increasing by approximately seven per cent over the last ten years (Figure 15). The largest growth has been in those holding bachelor or higher level degrees (ABS, 2018c). The growth in diploma and advanced diploma qualifications similarly reflects the transition to a more highly skilled and knowledgeable workforce.

The improvement in Queensland's educational profile is stronger than for the rest of Australia across all areas (Figure 15) (ABS, 2016). This improving educational profile will be important in driving the advancement of the Queensland economy in the coming years.

Figure 15: Growth in non-school qualifications (%)*, Queensland and Australia, 2006-2016



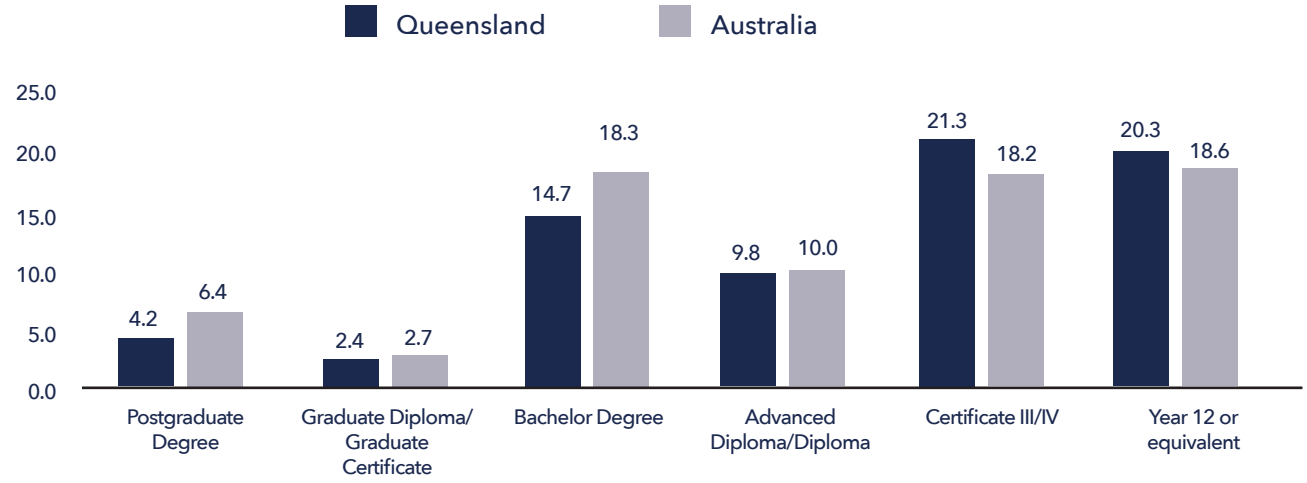
*Qualifications held by persons aged 15 and over
(a) Includes bachelor degree, graduate diploma, graduate certificate and postgraduate degree
(b) Includes certificate I, II, III and IV and certificates without further defined responses
(c) Includes inadequately described and not stated level of education responses

0.5

Source: Australian Bureau of Statistics, 2016, Time series profile – T29 and T31c – licensed and adapted under CC BY 4.0.

Despite this recent growth, Queensland still falls below the Australian average in terms of higher educational attainment. Year 12 or equivalent remains the highest qualification held by one-fifth of the working population in Queensland (Figure 16) (ABS, 2018c). According to the Productivity Commission (2017), it is older workers who are less likely to hold a post-school qualification.

Figure 16: Highest level of educational attainment, Queensland and Australia, 2018



Source: Australian Bureau of Statistics, 2018b – licensed and adapted under CC BY 4.0.

Figure 16 shows that Queensland has traditionally been strong in the area of trade and technical skills, with a larger proportion of the population holding post-school qualifications at certificates III and IV compared to Australia overall. Our VET system has had an important role in providing a skilled workforce to meet the needs of industry. In 2018, over 31 per cent of the Queensland working age population held a post-school qualification gained through the VET system (Figure 16) (ABS, 2018b).

With projections showing that the number of workers with certificate-level qualifications and advanced diploma and associate degree qualifications will increase 7.8 per cent and 13.4 per cent respectively by 2022, the VET system will continue to play a significant role in meeting future skills needs (Jobs Queensland, 2018a). VET will need to respond to this demand in two ways – through providing entry-level pathways into the labour market and by providing opportunities for career building and lifelong learning through upskilling and reskilling.

The apprenticeship and traineeship system has been an enduring and respected pathway to employment in Australia for many years, and the future offers both opportunities and challenges. Technology will enable increased collaboration between employers, employees and training providers and innovative ways of training, while requiring the transmission of new and exciting technical skills. The VET sector, including through work-based training pathways such as apprenticeships and traineeships, will play a key role in fostering the innovation and connections with industry that will be vital in harnessing the opportunities of the future.

There is also projected to be strong growth in demand for higher education qualifications into the future (Jobs Queensland, 2018a). There are ten universities with major campuses operating in Queensland that collectively teach over 230,000 students (including over 40,000 from abroad) (Study Queensland, 2018). Developing effective pathways into and between initial and ongoing post-secondary education at all levels and the labour market will also be vital for the higher education system and Queensland's workforce more broadly.

Lifelong learning must be underpinned by an approach to education that prepares the current and future workforce for jobs that have not yet been imagined, to solve problems that have not yet been anticipated, and work with technologies not yet invented. Queensland's schools are also playing their part in supporting the workforce of the future.

One example of how this is taking place in Queensland is through the implementation of a strategy for science, technology, engineering and math (STEM) education in Queensland's state schools (Education Queensland, 2018). The Gateway to Industry Schools Program (GISP) is another example of industry and schools partnering to raise the profile of careers within a range of industries through the development of collaborative regional hubs and Gateway Days events (Jobs Queensland, 2018b). The uptake of the VET in Schools program is significant with Queensland being the largest user of this program nationally. In 2017, 32,820 students from 483 schools received a VET qualification (Queensland Curriculum and Assessment Authority, 2018).

A key recommendation from the Select Committee on the Future of Work and Workers (2018) is that there needs to be greater collaboration between the school sector and post-school education and training and industry to prepare young people entering the education system for work of the future. Equipping young people with skills such as communication, problem solving and teamwork may support their transition from school to work (FYA, 2018). Relevant work experience, work integrated learning and part-time work in the industry of career choice are all considered to be 'accelerators' of the transition.

Nevertheless, more will be needed to build our human capital and capitalise on our areas of natural strength. Global competitiveness relies on innovation, customisation and quality – all of which are underpinned by skills and capability.

As a modern economy with a high standard of living, our ability to innovate and to identify niche areas of competitive advantage will be critical (Hajkowicz, et al., 2018). As Queensland's industries and regions transition to new economies and new ways of working, timely access to relevant upskilling and reskilling opportunities for impacted workforces is needed to support these transitions (Jobs Queensland, 2018d).

Education – be that school, VET or higher education – will be one of the most critical factors shaping workforce outcomes in the future. The research not only suggests that most of the new jobs of the future will require higher levels of skills but also that continual investment in education will be required in order to keep up with the rate of change brought about by developments in digital technology. The changing pattern of enrolments is already showing that Queenslanders are beginning to invest in lifelong learning (ABS, 2018c).

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