Australian
Industry and
Skills Committee

National Industry Insights Report

2019/20 National Overview

This document is a print friendly version of the National Overview section of the National Industry Insights Report website.

The National Overview can be viewed online at <https://nationalindustryinsights.aisc.net.au/national>.

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The National Skills Overview provides analysis of industry skills needs and the factors and trends affecting the demand for skills at a national and cross-industry level.

The overview draws on Industry Reference Committee (IRC) 2019 Skills Forecasts and Proposed Schedules of Work and supports the design and development of training packages that meet the current and future skills needs of industry.

It links the cross-industry analysis on skills needs with the activities and initiatives of the Australian Industry and Skills Committee and its network of Industry Reference Committees.

The National Skills Overview consists of four key sections which are listed below.

Contents

Insights and highlights

Overview

This section provides a summary of the top five skills which were highly prioritised across IRC Skills Forecasts, the factors and trends which affect the demand for these skills, and key initiatives underway which aim to address skills needs.

The top five skills, of eleven skill areas, were identified by Industry Reference Committees (IRCs) in their 2019 Skills Forecasts. The skills set out in the **Future skills and training: A practical resource to help identify future skills and training** report have been used as a framework for organising these skill areas.

It is evident from the analysis that there is a huge industry demand for cross-sector skills such as adaptability, analytical, digital, and collaboration skills.

Given the ever-evolving challenges that industry face due to factors such as structural change, economic cycles, changing markets, and emerging technology, these transferable cross-sector skills are critical for ensuring Australia's workforce can adapt to the ever-changing environment.

In addition, industry and occupational-specific skills remain a priority for all industries, with many IRC Skills Forecasts identifying key technical skills in demand. Indeed, these specific skills for specific jobs remain an integral part of Australia's vocational education and training system.

For more detailed analysis on each of the eleven priority skill areas and industry demand please visit the **Priority skills** page. For more information on the factors driving demand for skills, please visit the **Factors and trends** page, and to find out about cross-sector projects and training package development work underway, please visit the **Key initiatives** page.

The top five priority skills are summarised on the following pages.

Adaptability skills

As demand for skills constantly adapts to new technologies and job requirements, workers must enhance their ability to adapt to new situations and acquire new skills. As the world of work becomes more flexible, individuals are expected to take more responsibility for their own skills development.

RANKED 1ST
highest priority generic skill across all industries

PRIORITY SKILLS

Skills identified by IRCs

- Adapt to changes
- Changing skill needs arising from new technologies
- Emotional intelligence
- Resilience, stress tolerance and flexibility
- Self-management

FACTORS AND TRENDS

Driving demand for skills

- Artificial intelligence and machine learning
- Augmented Reality and Virtual Reality
- Automation and robotics
- Big data and data analytics
- Demand for care-related services and products
- Demographic changes
- Digitisation and the 'internet of things'
- Emerging markets
- Emerging technologies
- Empowered customers, and changing work and career values
- Globalisation and its impact on mobility, migration and international markets
- High and complex regulatory environment
- Increasing participation by equity groups
- International and domestic sustainability action
- Policy environment
- Political appetite for reform
- Skills mismatch, shortages or gaps
- Technologically advanced materials and products.

Collaboration skills

Those able to collaborate and share information are best able to adapt to changing markets and technologies, interact in diverse workplaces, and effectively respond to customer needs. Skills that enhance collaboration include communication and teamwork skills, relationship management, and social and cultural awareness.

RANKED 2ND
highest priority generic skill
across all industries

PRIORITY SKILLS

Driving demand for skills

- Communication skills
- Cultural and global awareness
- Customer service
- Emotional intelligence
- Social perceptiveness and competence
- Teamwork.

FACTORS AND TRENDS

Skills identified by IRCs

- Access to quality internet
- Changing work and career values
- Changing workplace dynamics
- Demographic change
- Emerging markets
- Global mobility
- Growing demand for care-related services and products
- Increased participation by equity groups
- Innovation ahead of regulation
- Sustainability action, driving the demand for more sustainable products and services.

Analytical skills

Data is becoming increasingly available, with 'big data' derived from online activity, sensors, the 'internet of things', new analytical tools, and artificial intelligence. With this, comes an expectation that workers in almost all industries, and across most roles, will be able to use available data to derive value, and improve products and services.

This may require the ability to analyse and present raw data or to interpret data analysis and apply findings. It may perhaps also involve other skills, such as data management, information literacy, problem-solving, critical thinking and creative thinking.

RANKED 3RD
highest priority generic skill
across all industries

3

PRIORITY SKILLS

Skills identified by IRCs

- Analytical thinking and innovation
- Creativity, and creative problem solving
- Critical thinking
- Diagnosis, analysis and evaluation skills
- General analytical skills
- Identifying, locating, interpreting and evaluating information
- Innovation
- Problem solving.

FACTORS AND TRENDS

Driving demand for skills

- Artificial intelligence and machine learning
- Augmented Reality and Virtual Reality
- Big data and data analytics
- Cross-disciplinary science
- Digitisation and the 'internet of things'
- Emerging technologies
- Start-up thinking.

Digital skills

In a world of rapid technological expansion affecting all industries, it is vital to have a workforce that's agile, with the skills to drive and adapt to new technologies. Digital skills include coding and programming, development and use of robotic and automation technologies, leveraging ICT skills in business, and exploring the world of cloud computing and the 'internet of things'.

RANKED 4TH
highest priority generic skill
across all industries

4

PRIORITY SKILLS

Skills identified by IRCs

- Automated design
- Coding and programming
- Cyber security skills
- Digital literacy
- Digital skills relating to industry specific software and technology
- Information and communication technology skills
- Understanding and working with automation

FACTORS AND TRENDS

Driving demand for skills

- Access to quality internet
- Artificial Intelligence and machine learning
- Automation and robotics
- Big data and data analytics
- Changing workplace dynamics
- Digitisation and 'Internet of Things'
- Emerging or changing markets
- Emerging technology
- Empowered customers
- Globalisation and its impact on mobility, migration and international markets
- More technologically advanced materials and products.

Industry and occupation skills

Industry and occupation skills refer to specific skills that various IRCs have identified as being a priority for their industry. These skills vary from industry to industry and they are unpacked further on the Priority skills page.

Industry and occupation-specific skills
are important in most industries

PRIORITY SKILLS

Skills identified by IRCs

- Cross-industry skills and trades
- Industry or occupation-specific skills
- Industry or occupation-specific knowledge, including technical, product and market-related knowledge
- Understanding and use of equipment or technology.

FACTORS AND TRENDS

Driving demand for skills

- Attracting and retaining a workforce
- Automation and robotics
- Big data and data analytics
- Demographic changes, and their impact on workforce and markets (adaptability)
- Digitisation and the Internet of Things
- Emerging or changing markets
- Emerging technologies
- Policy environment
- High and complex regulatory environment
- Skills mismatch, shortages or gaps
- Sustainability action, driving the demand for more sustainable products and services.

Factors and Trends

Overview

This section examines some of the high-level factors and trends which influence and drive the demand for skills.

This includes economic conditions and trends in the labour market, as well as other factors such as changes in society and culture, business and market, advancements in technology, implications arising from climate change and increasing emphasis on sustainable environmental practices, and policy, institutional, and regulatory requirements.

Drawing on information from the Industry Reference Committee (IRC) Skills Forecasts, this section identifies which factors are having a greater impact on different industries.

The report **Future skills and training: A practical resource to help identify future skills and training** provides more detail on some of the factors listed above and is available on the Australian Industry and Skills Committee (AISC) website.

Factors identified as having the greatest impact on industry are:

ECONOMIC CONDITIONS

TRENDS IN THE LABOUR MARKET

SOCIETY AND CULTURE

BUSINESS AND ECONOMICS

TECHNOLOGY

RESOURCES AND ENVIRONMENT

POLICY AND REGULATORY

Economic conditions

Australia continues to experience growth and low unemployment. In 2019, the top three industries contributing to this growth were:

- Mining
- Financial and insurance services
- Construction.

Gross Value Added (GVA)

All industries

↑ **1.9%** 2018-2019 percent change

2000

GVA - Top 3 contributing industries:

Manufacturing	12.6%
Financial and insurance services	$ 8.5%
Construction	6.9%

2019

GVA - Top 3 contributing industries:

Mining	10.2%
Financial and insurance services	$ 9.3%
Construction	8.0%

Aug 2019

Unemployment

- 5.3% overall
- 11.6% for 15-24 year olds

Underemployment

- 8.4% overall
- 17.6% for 15-24 year olds

Trends in the labour market

Industry employment level

High employing industries
2000 to 2019 employment level

Legend:
- Manufacturing
- Construction
- Retail Trade
- Education and Training
- Professional Scientific and Technical Services
- Health Care and Social Assistance
- Accommodation and Food Services
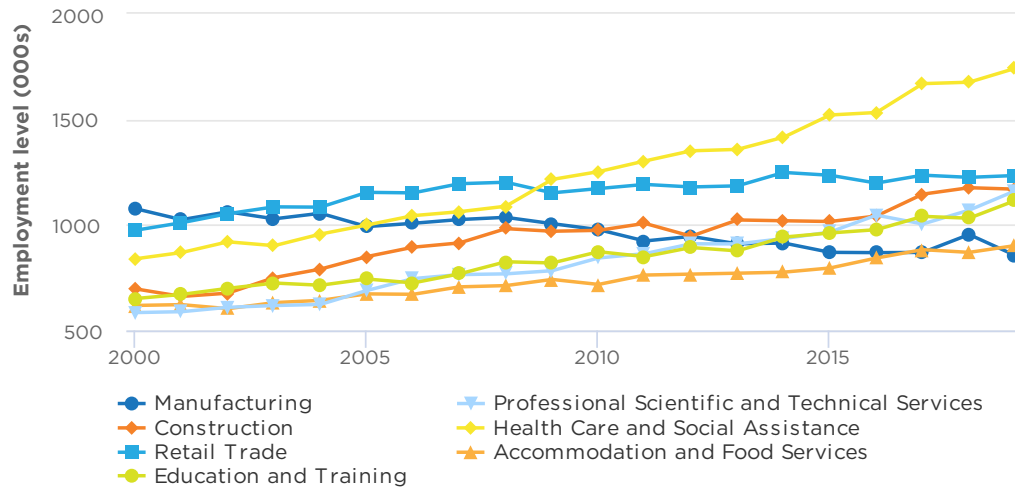
Medium employing industries
2000 to 2019 employment level

Legend:
- Wholesale Trade
- Financial and Insurance Services
- Public Administration and Safety
- Transport Postal and Warehousing
- Administrative and Support Services
- Other Services

Low employing industries
2000 to 2019 employment level

Legend:
- Agriculture Forestry and Fishing
- Mining
- Electricity Gas Water and Waste Services
- Information Media and Telecommunications
- Rental Hiring and Real Estate Services
- Arts and Recreation Services

Employment grew in absolute numbers for the majority of industries between 2000 and 2019. The main exceptions being the Agriculture, Manufacturing, and Information Media and Telecommunications industries, which saw a decline in their workforce over this period.

Industry and occupational structural change

Industry change
Change in industry structure 2000-2019, August quarter, %

Percentage change between 2000 and 2019

- Percentage change
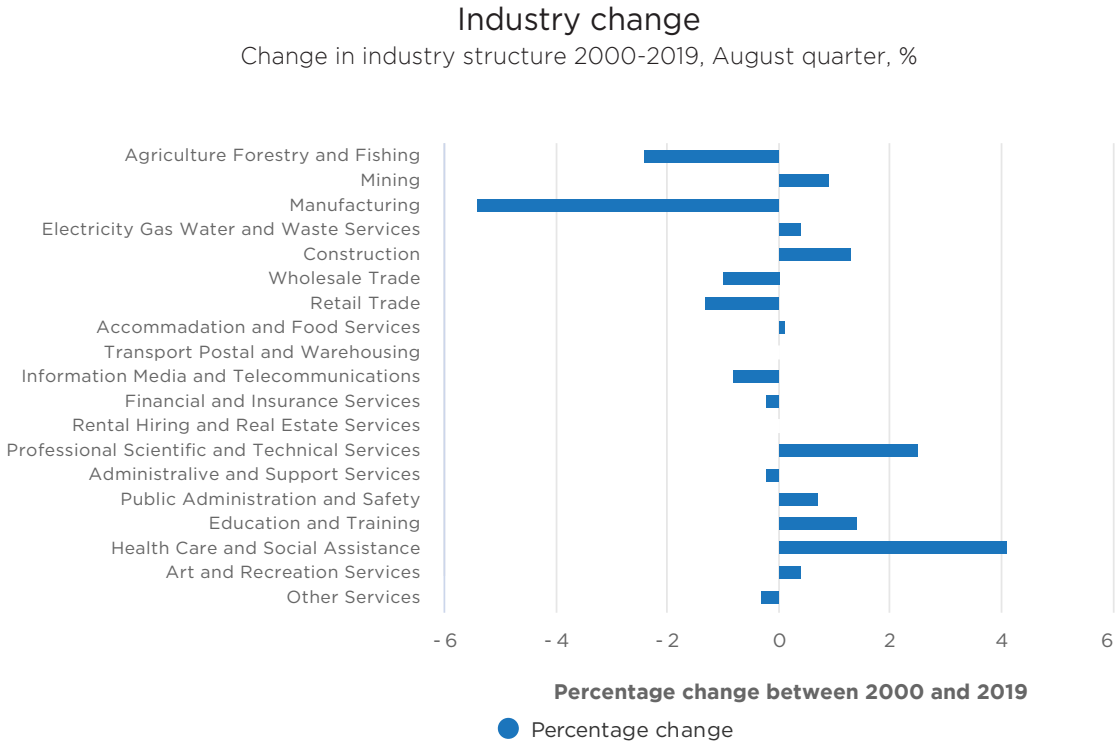
Occupation change

Change in occupational structure 2000-2019, August quarter, %

Percentage change between 2000 and 2019

● Percentage change
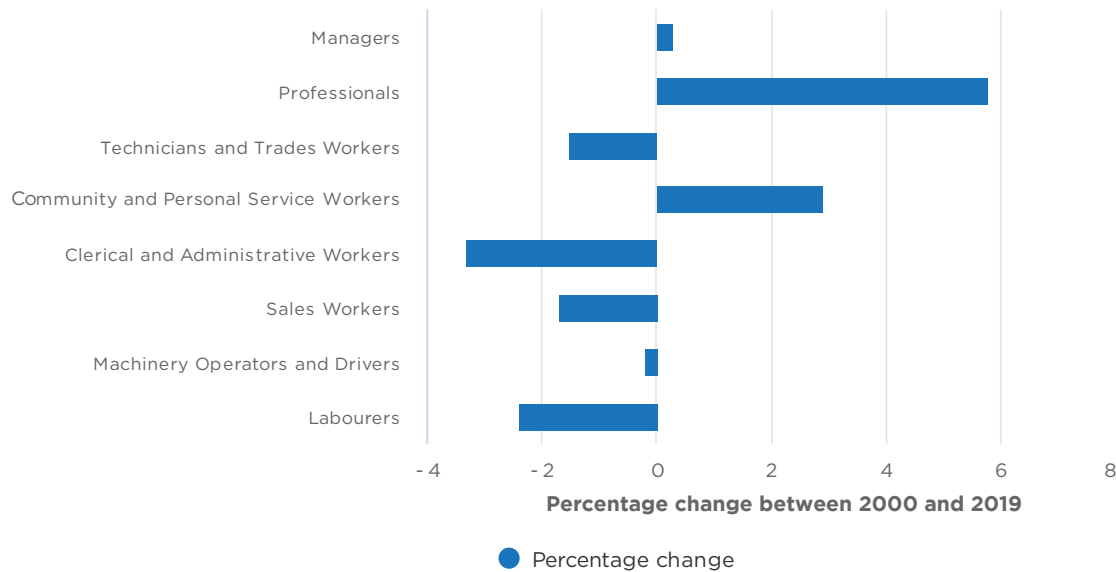
Employment status

Increase in part time employment staus between 2000-2019, August quarter, %

Percentage change between 2000 and 2019

● Percentage difference
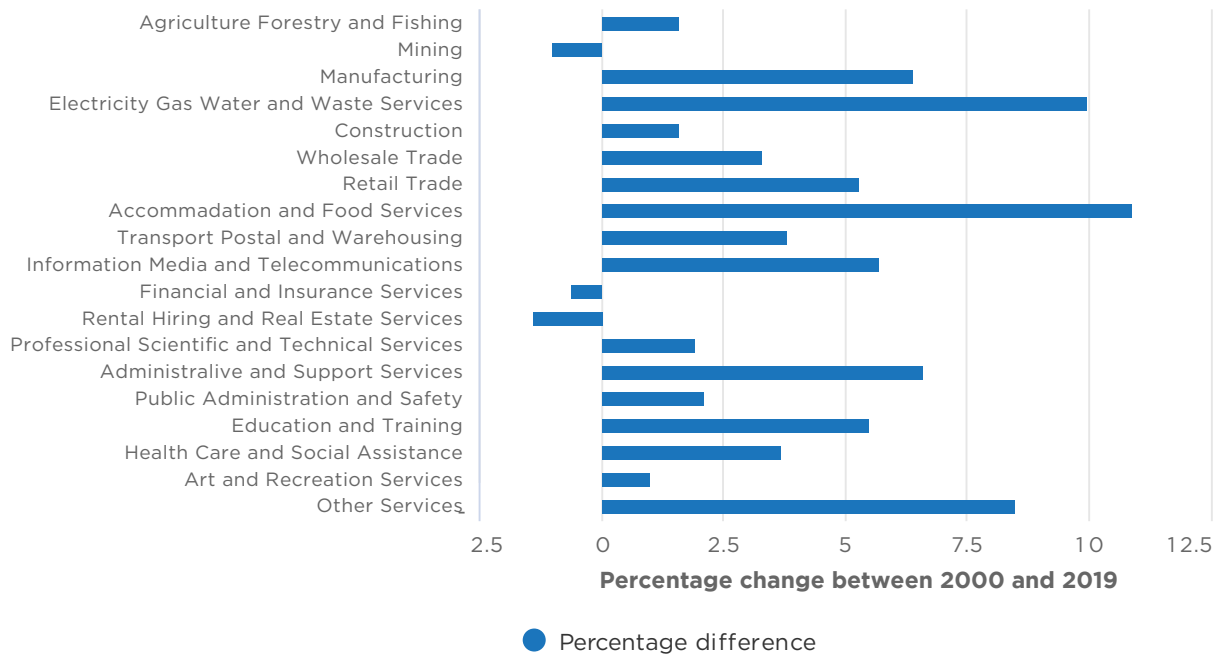
There is an evident shift in industry structure. The industries with the largest decline between 2000 and 2019 (in terms of share of total employment) are:

- Manufacturing (5.4 percentage points)
- Agriculture, Forestry and Fishing (2.4 percentage points).

The industries with the largest increases have been:

- Health Care and Social Assistance (4.1 percentage points)
- Professional, Scientific and Technical Services (2.5 percentage points)
- Construction (1.3 percentage points).

Within these three industries, and noting that over this time the number of people employed across all industries has grown by 44%, some of the industry sectors with the largest growth are:

227% Adult Community and Other Education

162.3% Other Social Assistance Services

149.3% Allied Health Services

144% Child Care Services

139.9% Architectural, Engineering and Technology

130.3% Medical Services

111.2% Computer System Design and Related Services

94.7% Management and Related Consulting Services

Legend: Health Care and Social Assistance; Education and Training; Professional, Scientific and Technical Services

The occupational structure of the labour market has changed over the same period as well, with higher-level skills increasingly more in demand. The occupation grouping with the largest growth is Professionals (increasing their share by 5.8 percentage points). The second largest increase is Community and Personal Service Workers (increasing its share by 2.9 percentage points).

Within the Community and Personal Service Workers category, for occupations where there were at least 20,000 people employed in 2019, the largest percentage increases between 2000 and 2019 are:

In terms of numbers employed however, the largest increases were:

199.5%
Aged and Disabled

168.2%
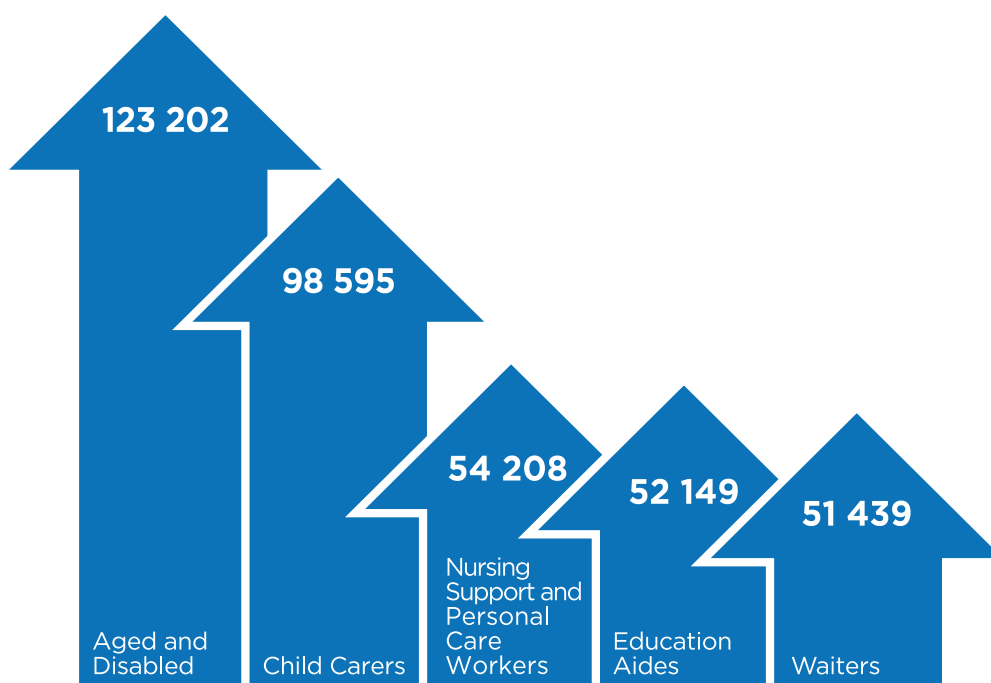Child Carers

141.5%
Waiters

103.2%
Education Aides

93.7%
Nursing Support and Personal Care Workers
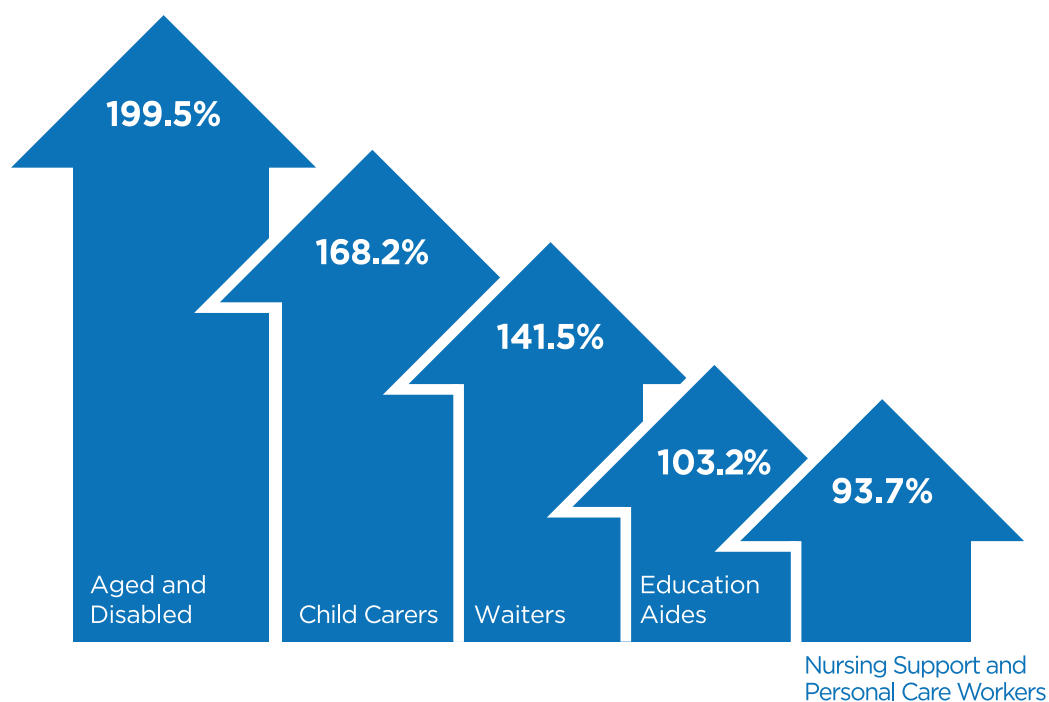
In most industries part-time employment is also growing. The industries with the largest increases in part-time employment (as a proportion of total employment between 2000 and 2019) were Accommodation and Food Services (10.9 percentage point increase), and Electricity, Gas, Water and Waste Services (10.0 percentage point increase).

123 202
Aged and Disabled

98 595
Child Carers

54 208
Nursing Support and Personal Care Workers

52 149
Education Aides

51 439
Waiters

Demographic trends

Australia's ageing population and workforce is affecting industries differently. In 2019, there were nine industries with 30% or more of their workforce aged 50 and over. More than half of Agriculture, Forestry and Fishing workers were 50 years or older (54.3%), but only 15.1% of Accommodation and Food Services workers were of that age.

Since 2000, there has been an increase in the proportion of the workforce aged 50 years and over in all industries. The industries which have seen the largest increase in the proportion of the workforce aged 50 and over are:

- Agriculture, Forestry and Fishing (18.2 percentage points)
- Public Administration and Safety (14.9 percentage points)
- Electricity, Gas, Water and Waste Services (11.4 percentage points)
- Transport, Postal and Warehousing (11.3 percentage points)
- Wholesale Trade (10.7 percentage points)
- Healthcare and Social Assistance (10.0 percentage points).
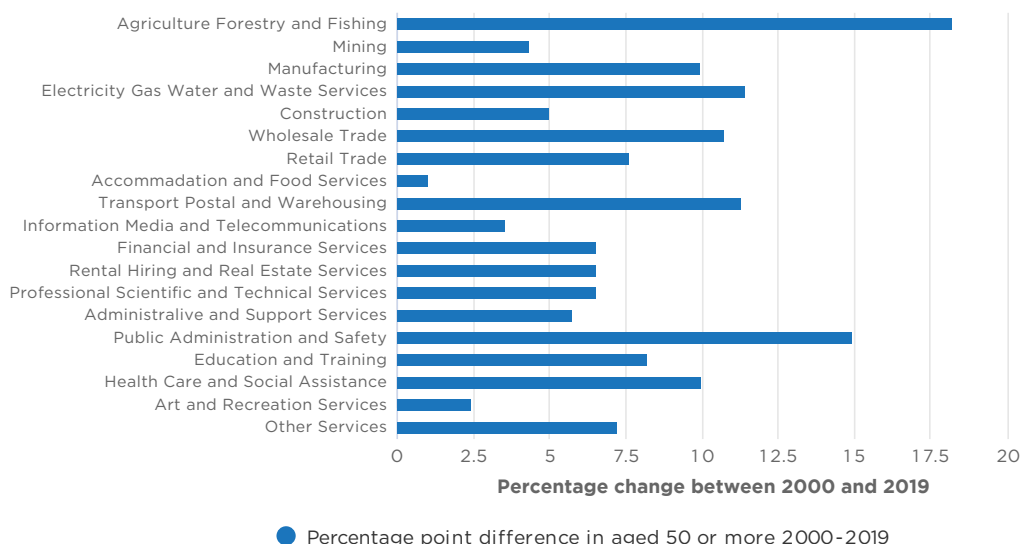
Workforce age

Proportion of industry workforce aged 49 and under and 50 and over, 2019, August quarter, %
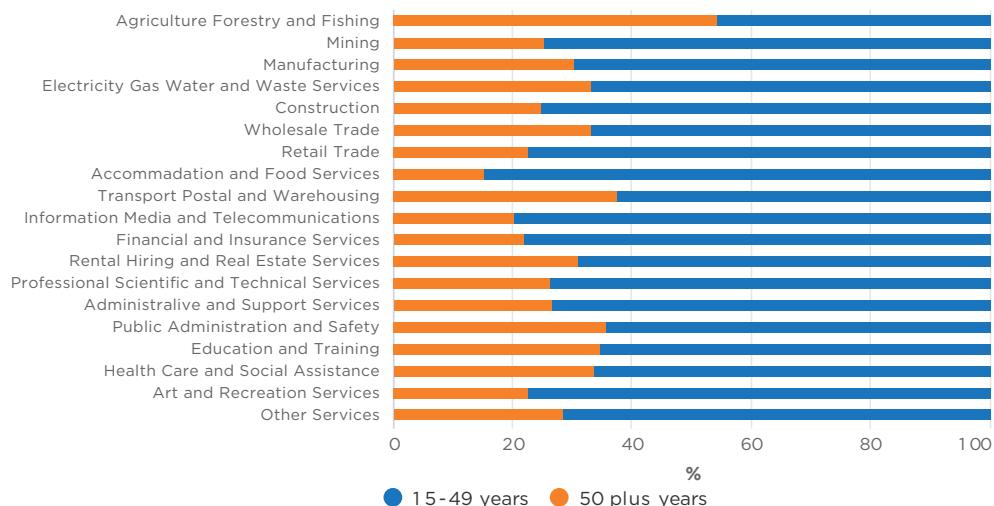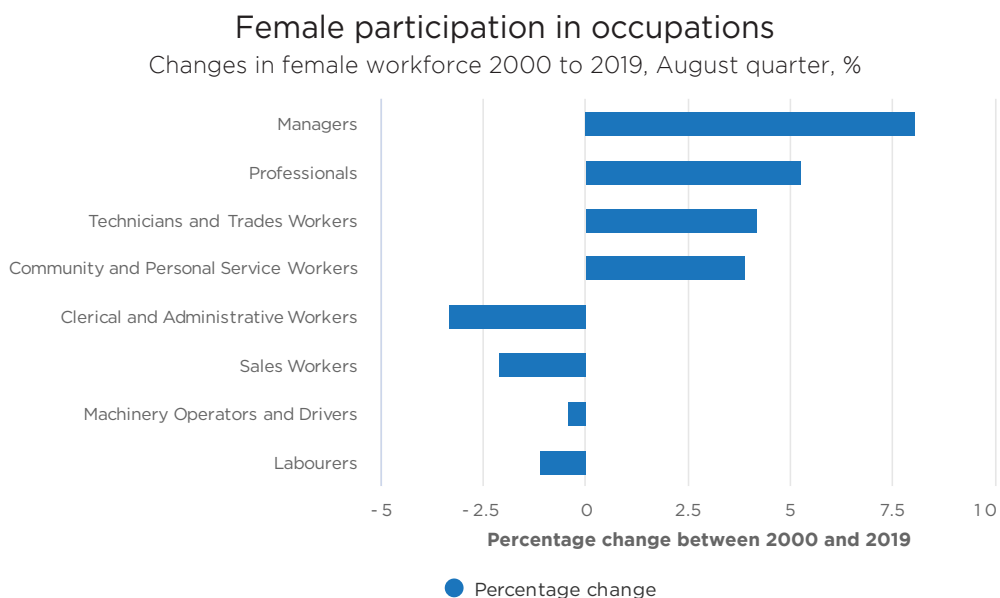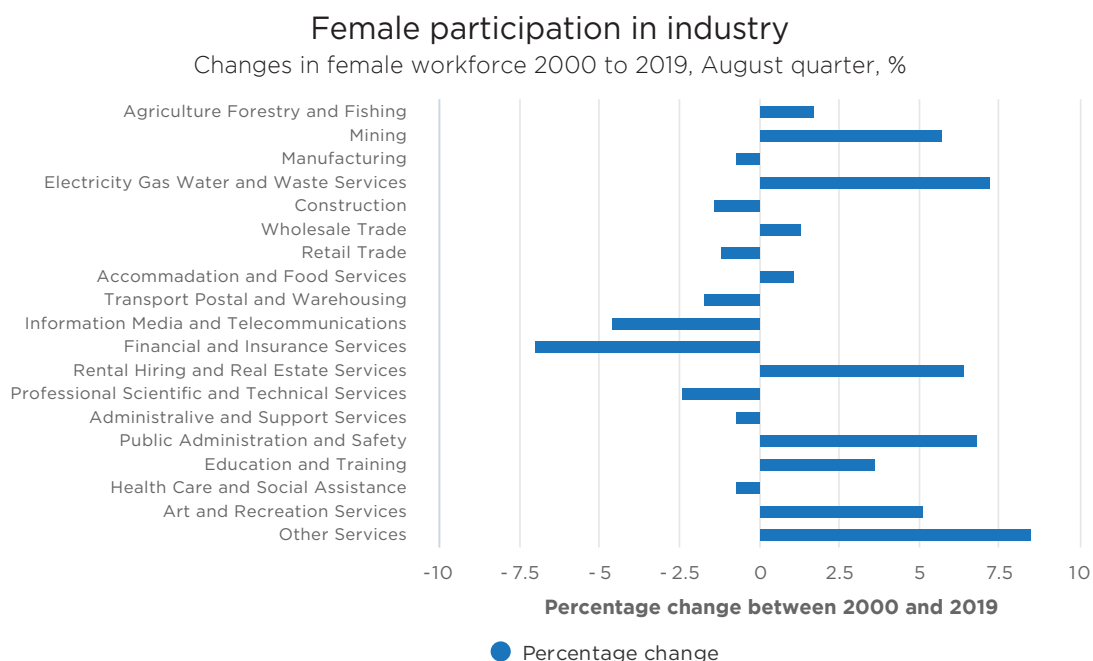

Ageing workforce

Proportion of industry workforce aged 49 and under and 50 and over, 2019, August quarter, %

Shifts in gender participation has varied across industry and occupation groups. For many industries, there was little change in the proportion of the female workforce between 2000 to 2019. Industries which have seen the largest growth in the female workforce are Other Services (8.5 percentage points), Public Administration and Safety (6.8 percentage points), Rental Hiring and Real Estate Services (6.4 percentage points) and Mining (5.7 percentage points).

Among occupation groups, Managers and Professionals have seen the strongest increase in the female proportion of the workforce between 2000 and 2019, with 8.1 percentage point and 5.3 percentage point increases respectively.

Female participation in industry
Changes in female workforce 2000 to 2019, August quarter, %

Percentage change between 2000 and 2019

● Percentage change

Female participation in occupations
Changes in female workforce 2000 to 2019, August quarter, %

Percentage change between 2000 and 2019

● Percentage change

Factors influencing the demand for skills

The Miles Morgan report, **Future skills and training,** identifies a number of factors and trends currently driving and influencing the demand for skills in Australia and internationally. The factors are grouped into five overarching clusters: society and culture, business and economics, technology, resources and environment, and policy and regulatory. Below is a brief overview of these factors, with more detailed information available in the **Future skills and training** report.

Society and culture

This group of factors relate to changes in society and culture which have implications on the labour market and skills.

Society and culture-related factors which affect the labour market include:

- Demographic changes, such as population growth and an ageing population and their impact on the workforce and markets, including industry adaptation to the diversity of workforce aspirations and experience
- Globalisation and its impact on mobility, migration and international markets
- Changing work and career values with a greater emphasis on flexible working arrangements, work/life balance and increase in part time work
- Attracting and retaining a workforce
- Suitably skilled workforce and access to suitable training
- Urbanisation and implications for regional, rural and remote areas
- Increased participation by women and gender-related disparity
- Increasing participation by equity groups
- Workforce vulnerability due to automation and cost reduction strategies.

The majority of IRC Skills Forecasts identify at least one society and culture factor which has had an impact on their industry sectors. The following industries identify more than one society and culture factor:

- Animal Care and Management
- Aquaculture and Wild Catch
- Business Services
- Community Services
- Construction
- Corrections and Public Safety – Correctional Services
- Education
- Electrotechnology
- Food and Pharmaceutical Product Manufacturing
- Forestry and Wood Products
- Government Services
- Health
- Manufacturing – Textiles, Clothing and Footwear
- Racing
- Retail and Wholesale
- Transport
- Utilities – Water.

The most prominent society and culture factor is demographic changes, particularly Australia's ageing population, but also population growth. Many industries cite an ageing workforce as being a potential challenge. The following quotes highlight just a few of the many industries experiencing challenges associated with an ageing workforce and population:

> The agricultural labour force is aging, with the average age of a farmer 17 years older than the average worker. (Agriculture, Horticulture and Land Management IRC's 2019 Skills Forecast)

> The implications of an ageing workforce means that the sector is likely to experience high levels of staff leaving the workforce due to retirement or making lifestyle, financial or health based choices to reduce working hours. (Direct Client Care IRC's 2019 Skills Forecast)

Such substantial changes in the age of the population will certainly put increasing pressures on health services as the prevalence of chronic pain conditions rises. Demand for ambulance services are among the many health services which are expected to significantly increase due to the growing ageing population and the related trend in favour of senior Australians continuing to live independently in their own homes. (Ambulance and Paramedic IRC's 2019 Skills Forecast)

However, the ageing population is also creating new markets and new opportunities for some industries:

While purchasing intentions for four- and five-door vehicles remain high, they have declined year-on-year by 18 per cent and 36 per cent, respectively. This trend is likely being supported by stronger SUV demand from baby boomers. For example, survey results suggest almost 38 per cent of baby boomers in the market for a new car are looking to buy a SUV – up from less than 16 per cent a decade ago. (Automotive Combined IRC's 2019 Skills Forecast)

Increasing demand for financial advice from superannuates, as growing post-retirement wealth creates a greater incentive to seek professional financial advice. Ability to assist clients through the potential emotional and psychological stress of retirement will also be crucial. (Financial Services IRC's 2019 Skills Forecast)

Other factors mentioned among IRC Skills Forecasts include:

- Attracting and retaining a workforce, including attracting younger workers, reducing high staff turnover, and changes to visa arrangements reducing access to overseas workers
- Increasing participation by equity groups, including promoting employment opportunities for people with disabilities and mature age workers, as well as responding to the growing needs of an ageing population who have a diversity of chronic conditions and disabilities,
- Globalisation and its impact on mobility, migration and international markets
- Changing work and career values / flexible working arrangements, work/life balance and part-time work
- Increased participation by women / gender disparity
- Workforce vulnerability due to automation and cost reduction strategies.

🌐💲 Business and economics

These factors relate to trends in business and markets which influences how companies do business. Factors include:

- High-speed competition and workplace dynamics involving re-organisation of human resources to sustain competition
- Start-up thinking (including entrepreneurialism, freelancing and contracting)
- Emerging or changing markets
- Skills mismatch, shortages or gaps
- Network working and producing and supply chain management
- Knowledge-based economy
- Empowered customers, and changing work and career values
- A growing demand for care-related services and products.

Many of the IRC Skills Forecasts discuss business and economics factors affecting their industry sectors. The following industries identify more than one business and economics factor which impacts on their industry:

- Agriculture
- Animal Care and Management
- Aquaculture and Wild Catch
- Financial Services – Insurance and Superannuation
- Food and Pharmaceutical Production – Meat
- Health
- Information and Communications Technology
- Personal Services – Beauty
- Pulp and Paper Manufacturing
- Utilities – ESI Transmission, Distribution and Rail

There were a variety of business and economics-related factors mentioned across the skills forecasts. Some of these factors were named across several IRC skills forecasts while some were identified less often. For some industries factors related to *skills mismatch, shortages or gaps,* including challenges associated with finding an appropriately skilled workforce, and job market demand exceeding the supply of appropriately skilled graduates. A few examples of these business and economics-related factors across some industries include:

> *Similar to other sectors, local government is experiencing significant skills shortages. In a recent ALGA survey, results showed that approximately 70% of councils are currently experiencing skills shortages. The top 10 professional skill shortage occupations uncovered showed that some of the occupations are supported by the Training Package, including Environmental Health Officers and Project Managers.* (Local Government IRC's 2019 Skills Forecast)

> *With the current rate of solar uptake, there is a reported shortage of qualified electricians with the necessary skills for the installation and maintenance of solar systems. Consequently, the related skills in the Electrotechnology industry need to change accordingly to meet the industry needs.* (Electrotechnology IRC's 2019 Skills Forecast)

> *The job market for graduates is currently larger than the supply of graduates, with estimates suggesting that in some situations there could be a discrepancy of up to five times, emphasising the complex and challenging contexts in which the agricultural industries operate.* (Agriculture, Horticulture and Land Management IRC's 2019 Skills Forecast)

Other business and economics-related factors mentioned related to:

- Emerging or changing markets, including the growth in products and services for an ageing population
- Growing demand for care-related services and products, such as an increasing demand for health services, particularly within the area of complex and long-term care
- Empowered customers, and changing work and career values, including consumer demands for more sustainable products

Technology

This group of factors cover the ever-evolving nature of technology and the implications it has for the workforce and skills needs. Factors include:

- Emerging technologies
- Digitisation and the Internet of Things, mobility and connectivity
- Big data and data analytics
- Artificial Intelligence (AI) and machine learning
- Automation and robotics (including drones)
- More technologically advanced materials and products
- Augmented Reality and virtual reality
- Optimising brain and cross-disciplinary science.

The vast majority of IRC Skills Forecasts identify technology factors as an issue affecting their industry sectors. Indeed, technology-related trends were raised more often than any of the other trends in the IRC Skills Forecasts. The following industries identify more than one technology factor which impacts on their industry:

- Agriculture
- Aquaculture and Wild Catch
- Arts, Culture, Entertainment and Design
- Business Services
- Community Services – Client Services
- Construction
- Corrections and Public Safety
- Electrotechnology
- Financial Services
- Forestry and Wood Products
- Government
- Health – Dental
- Information and Communications Technology
- Manufacturing – Metals, Engineering and Boating Industries
- Mining, Drilling and Civil Infrastructure – Civil Infrastructure
- Printing and Graphic Arts
- Property Services
- Retail and Wholesale
- Tourism, Travel and Hospitality
- Transport
- Utilities.

The most prominent technology factors were *automation and robotics (including drones)*, and *digitisation and the Internet of Things, mobility and connectivity*. Several industries cite automation as providing a range of benefits, including improved workforce efficiency, enabling remote operations, and cost reduction in many areas. *Mobility and connectivity* have been identified by some industries as enabling market expansion, while *digitisation and the Internet of Things* has for certain industries improved project management processes, as well streamlining warehousing and despatching processes. However, these technology factors have implications for the way work is conducted and therefore the skills mix required.

The following quotes provide an example of how technology is impacting some industries:

> *With over 37,000 kilometres of natural gas transmission pipelines, the gas industry is poised to benefit from robotics opportunities which enable remote operations and increase oversight of utilities and infrastructure…The workforce needs to have skills in collecting, modelling, and analysing data in remote or hard-to-access areas.* (Gas IRC's 2019 Skills Forecast)

Increasingly, employers are describing robotics and automation as imperatives for their businesses. Due to the likelihood that most manual processes will eventually be automated, employers are looking for laboratory services technicians, who are comfortable and practised in their use of automation. These workers will require higher skill levels to maximise the use of new technology. (Manufacturing and Engineering IRC's 2019 Skills Forecast)

These technologies, utilising information from the connectivity of the Internet of Things concept, are changing consumers' behaviour, enabling them to monitor and adjust their electricity usage on-demand. Consequently, the workforce will need to be skilled in digital literacy, cybersecurity, and data analytics to meaningfully interpret data to improve productivity and customer services. (Electrotechnology IRC's 2019 Skills Forecast)

Other technology factors which are mentioned in some of the IRC Skills Forecasts include:

- Emerging technologies
- Big data and data analytics
- Artificial Intelligence (AI) and machine learning
- More technologically advanced materials and products
- Augmented reality and virtual reality.

Resources and Environment

These factors cover issues such as climate change, international action on sustainability, as well as access to reliable internet, and the implication for business, the workforce and education and training. Factors include:

- Sustainability action, driving the demand for more sustainable products and services
- Climatic weather shifts and the impact of climate change
- Improving energy efficiency
- Access to quality internet
- Financial viability.

Less than half of the IRC Skills Forecasts discuss resources and environment factors as an issue affecting their industry sectors. The following industries mention more than one resources and environment factor:

- Amenity Horticulture and Conservation
- Aquaculture and Wild Catch
- Construction
- Forestry and Wood Products
- Printing and Graphic Arts
- Pulp and paper manufacturing
- Utilities.

The most prominent resources and environment factor is *sustainability action*, which is driving the demand for more sustainable products and services. Some industries cite *sustainability action* as being a potential challenge for the industry due to changing customer expectations and changes in approaches to business operations and challenges in meeting skill requirements. However, most industries identify *sustainability action* as leading to new opportunities and markets.

Some of the resource and environment factors identified include:

> *Hybrid and electric vehicles are becoming increasingly attractive alternatives to conventional vehicles. As at July 2018, consumer research indicates that the majority (52 per cent) of Australians aged 18 and over would 'seriously consider buying' a hybrid vehicle, representing a rise since previous survey results. Furthermore, survey results suggest over 60 per cent of Australians are willing to pay more for a car with 'zero emissions', supporting that environmental consciousness is a factor in car purchases.* (Automotive Combined IRC's 2019 Skills Forecast)

> *With increasing emphasis on climate change, sustainability and energy consumption, the smart and green construction industry is growing worldwide. Benefits of smart and green buildings include lower operating costs, increased value of buildings, higher rental and occupancy rates, and improved health and productivity of occupants. They also necessitate new knowledge and skills in occupational areas such as energy efficiency, new products and water conservation.* (Construction Plumbing and Services IRC's 2019 Skills Forecast)

> *Environmental sustainability will be important skills for workers as the sector continues to advance processes around disposal of waste and environmental hazards. This is reflected in standards and targets set by the industry and organisations such as the Australian Packaging Covenant Organisation to meet in order to reduce the impact of printing and packaging on the environment.* (Printing and Graphic Arts IRC's 2019 Skills Forecast)

Related to this, the effects of *climate weather shifts and the impact of climate change* were also discussed in a few of the IRC Skills Forecasts. This also leads to both challenges and opportunities in the need to adapt to changing expectations by both customers and governments. This also presents the need for a workforce that has the skills and knowledge required to respond and manage the various unique industry impacts of climate change and climate weather shifts. Other resources and environment factors identified by a few IRC Skills Forecasts include:

- Improving energy efficiency
- Access to quality internet.

Policy and regulatory

This group of factors covers the policy and regulatory factors which influence the demand for skills, including understanding and adhering to the regulatory environment, the policy environment and its implications for businesses and the workforce, and reform in the education and training sector. Factors include:

- Innovation ahead of regulation
- Policy environment
- Appetite for reform
- High and complex regulatory environment
- Safety requirements.

More than half of the IRC Skills Forecasts rank policy and regulatory factors as an issue affecting their industry sectors. The following industries mention more than one of these factors:

- Animal Care and Management
- Aquaculture and Wild Catch
- Community Services
- Construction
- Food and Pharmaceutical Production
- Health
- Racing
- Transport
- Utilities – ESI Generation.

The most prominent policy and regulatory factors mentioned across the IRC Skills Forecasts are *policy environment* and *high and complex regulatory environment*. For most industries a *policy environment* and a *high and complex regulatory environment* are part of the operational environment, either specific to the industry or applied more broadly, and can include:

- Licensed occupations
- Industry standards
- Legislation to manage and protect resources
- Workplace health and safety legislation
- Legislation to protect consumers (noting that these can vary by state or territory)
- Changes to government policy which at times can impact workforce operations, as well as require businesses to update core procedures and processes.

Many industry sectors report the need for business and compliance skills to enable the workforce to negotiate the regulatory environment. Regulation has also led to new technologies in some areas that require new skills. This can also have implications for training package development.

A few policy and regulatory factors identified by some industries include:

> *The sector is highly regulated across every level, meaning that businesses must adhere to overlapping international, national, state and local compliance legislation…Supporting sustainable fisheries and marine environments has also led to complex regulatory arrangements, licensing issues and quotas that have hampered productivity.* (Aquaculture and Wild Catch IRC's 2019 Skills Forecast)

> *Government policy/legislation changes – a number of national and state/territory-based Royal Commissions into areas of relevance for the CS&D sector (i.e. child protection, family violence, aged care, etc.) have released key recommendations impacting workforce practices…The introduction of minimum requirements for accreditation for providing statutory out-of-home care and adoption services (i.e. NSW Child Safe Standards for Permanent Care) will impact training and registration requirements of the workforce involved in child protection services.* (Community Sector and Development IRC's 2019 Skills Forecast)

The regulatory and policy environment pertaining to the VET sector is complicated, with numerous layers of State and Federal regulation and standards. This creates a complex operating environment for organisations as well as individual trainers and assessors who must stay abreast of varying requirements. (Education IRC's 2019 Skills Forecast)

In contrast, at least one of the skills forecasts mention a lack of legislation and regulation around new technologies. An example of this is the Information and Communications Technology industry which conveyed concerns over regulation and standards being unable to keep up with the pace of new technology, therefore creating industry wide challenges relating to product quality.

Method and sources

Methodology

The factors and trends framework has largely been based on the factors outlined in the Miles Morgan report **Future skills and training: A practical resource to help identify future skills and training.** The report outlines a number of factors which are influencing the demand for skills in the following broad categories: society and culture, business and economics, technology, resources and the environment, policy and regulatory.

A systematic review of the Skills Forecasts from 2019 has been undertaken to identify which factors are most prevalent for the IRCs.

Employment data has also been provided to show how labour market trends have also been shaping the workforce between 2000 and 2019.

Sources

Australian Bureau of Statistics 2019, *Gross Value Added (GVA) by Industry,* 5204.0 – Table 5, viewed February 2020
https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/5204.02018-19?OpenDocument

- GVA percentage change, 2018-2019
- Top three contributing industries, 2000 and 2019

Australian Bureau of Statistics 2019, *Underutilised persons by Age and Sex - Trend, Seasonally adjusted and Original,* 6202.0 – Table 22, viewed February 2020
https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6202.0Jan%202020?OpenDocument

- Unemployment August 2019 (all and 15-24 year olds)
- Underemployment August 2019 (all and 15-24 year olds)

Australian Bureau of Statistics 2019, *Employed persons by Industry group of main job (ANZSIC), sex, state and territory, November 1984 onwards,* 6291.0.55.003 - EQ06, viewed February 2020,
https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Nov%202019?OpenDocument

- Employed total by ANZSIC 1 digit Industry, 2000 to 2019, August Quarter
- Employed total, percentage change by ANZSIC 1 digit Industry, between 2000 and 2019, August Quarter
- Employed total, percentage change by ANZSIC 3 digit Industry group, between 2000 and 2019, August Quarter, for selected industry sectors
- Employment status, percentage change by ANZSIC 1 digit industry, between 2000 and 2019, August Quarter

Australian Bureau of Statistics 2019, *Employed persons by Industry group of main job (ANZSIC), sex, state and territory, November 1984 onwards,* 6291.0.55.003 - EQ09, viewed February 2020,
https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Nov%202019?OpenDocument

- Employed total, proportion of females in workforce, percentage change by ANZSIC 1 digit Industry, between 2000 and 2019, August Quarter

Australian Bureau of Statistics 2019, *Employed persons by occupation group of main job (ANZSCO), sex, state and territory, November 1984 onwards,* 6291.0.55.003 - EQ08, viewed February 2020
https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Nov%202019?OpenDocument

- ANZSCO 1 digit occupation, percentage change between 2000 and 2019, August Quarter
- ANZSCO 4 digit occupation unit group, percentage change between 2000 and 2019, August Quarter

Australian Bureau of Statistics 2019, *Employed persons by Age and Industry division of main job (ANZSIC), November 1984 onwards*, 6291.0.55.003 – EQ12, viewed February 2020
https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Nov%202019?OpenDocument

- Employed total, proportion of workforce aged 49 and under and 50 and over by ANZSIC 1 digit level, 2019, August Quarter
- Employed total, proportion of the workforce aged 50 and over by ANZIC 1 digit level, percentage change difference between 2000 and 2019, August Quarter

Priority skills

Overview

This section provides a summary of key skills identified by Industry Reference Committees (IRCs) in their 2019 Skills Forecasts.

IRCs have pinpointed a variety of skills as priorities for their industry. Drawing on the skills framework set out in the report **Future skills and training: A practical resource to help identify future skills and training**, these have been grouped within eleven high-level skill areas for the purposes of this analysis.

For more information on the factors driving demand for skills, please visit the **Factors and trends** page. For information on the cross-sector projects and training package development work underway, please visit the **Key initiatives** page.

Each page below contains a summary of the skill need, industry demand for that skill, and case studies of industry clusters and sectors with a specific need for these skills:

INDUSTRY AND OCCUPATION SKILLS

ADAPTABILITY AND LEARNING SKILLS

ANALYTICAL SKILLS

BUSINESS AND COMPLIANCE SKILLS

COLLABORATION SKILLS

CUSTOMER SERVICE AND MARKETING SKILLS

DIGITAL SKILLS

FOUNDATION SKILLS

LEADERSHIP AND MANAGEMENT SKILLS

STEM SKILLS

SUSTAINABILITY AND NATURAL RESOURCE MANAGEMENT SKILLS

Industry and occupation skills

Overview

Industry and occupation skills refer to specific skills that different IRCs have identified as being a priority for their industry.

While all industries and occupations require skills specific to the industry or occupation, many IRC Skills Forecasts identified specific technical skills which are a high priority. These skills vary from industry to industry — some are specific to the context of a particular industry or occupation, others apply to multiple industries and occupations. The following groups of industry occupation skills and knowledge will be discussed further below:

- Occupation and industry-specific skills
- Cross-industry skills and trades
- Industry knowledge
- Understanding and use of technology and equipment.

Industry skills needs

Industry and occupation-specific skills

This refers to the specific skills IRCs identified as being unique to their industry and occupations. Many IRCs identified industry or occupation-specific priority skills, including (but not limited to) skills like:

- Animal welfare, and integrity and ethical conduct in the Racing industry
- Application of traceability processes in Food, Beverage and Pharmaceutical Product Manufacturing industry
- Ethical animal use in the Animal Care and Management industry
- Facilitating online and face to face learning, and the ability to identify individual learner needs in the Education industry
- Fault diagnosis and mechanical and electrical repair of modern vehicle systems in the Automotive industry
- Financial literacy, capacity and industry knowledge in the Financial Services industry
- Genetics and molecular testing diagnostics in the Laboratory Operations industry
- High pressure water jetting and vacuuming in the Recreational Vehicles industry
- Industrial sewing in the Textiles, Clothing and Footwear industry
- Maintenance of ageing aircraft in the Aerospace industry
- Mechatronics in the Metals, Engineering and Boating industry
- Piloting in the Aviation industry
- Pulp de-inking and bleaching for high and medium grade paper products in the Pulp and Paper Manufacturing industry
- Search and rescue in the Public Safety industry
- Track vehicle operations and signalling in the Rail industry
- Transmission, cabling and electrical in the ESI Transmission, Distribution and Rail industry
- Treatment and processing in the Water industry.

Please visit **industry sector pages** for more information on the specific skills for each industry and Industry Reference Committee.

Cross-industry skills and trades

This refers to specific technical skills that are important across different industries. Several IRCs identified cross-industry priority skills and trades. This includes skills like:

- Electrical skills
- Health and safety
- Maintenance and servicing
- Testing and diagnostics

Industry-specific knowledge

This refers to the specific knowledge that IRCs identified as a priority for their industry. It includes knowledge of materials and products as well as knowledge of the industry sector. Some of the IRCs and industry sectors that identified industry knowledge as being a priority include:

- Aerospace
- Arts, Culture, Entertainment and Design
- Automotive
- Aviation
- Business Services
- Education
- Information and Communications Technology
- Laboratory Operations
- Printing and Graphic Arts
- Rail.

Understanding and use of equipment or technology

This refers to examples where IRCs identify skills required in using specific equipment or technology, such as:

- Technology skills for paper bag, paper stationary and sanitary paper production manufacturing in the Pulp and Paper Manufacturing industry.

Whether skills are referred to specifically or more generally, it is clear there is a need for technical and occupation-specific skills across all industries.

Case studies

Laboratory Operations, and Food, Beverage and Pharmaceutical Product Manufacturing Industries

Included in this case study are two distinct industry clusters, both of which identified specific industry and occupation-related skills as priorities for their workforce.

- Laboratory Operations, which covers diverse range of technical and scientific operations across a variety of industry sectors, such as:
  - Biomedical laboratories
  - Biotechnology
  - Construction materials testing
  - Defence laboratories
  - Environmental testing/monitoring
  - Food and beverage testing
  - Manufacturing testing
  - Mineral assay
  - Pathology testing
  - Process manufacturing
  - Wine making

- Food, Beverage and Pharmaceutical Product Manufacturing, which comprises three sectors:
  - Food Product Manufacturing
  - Beverage Manufacturing
  - Pharmaceutical and Medicinal Product Manufacturing

The industry and occupation-related skills identified by these industries were:

- Laboratory Operations:
  - Point of Care Testing (PoCT)
  - Surgical cut-up
  - Genetics and molecular testing diagnostics

- Food, Beverage and Pharmaceutical Product Manufacturing:
  - Product and equipment handling including transporting, processing packaging and stock control
  - Application of traceability processes
  - Operating new technologies including provenance processes and systems.

The following quotes have been sourced from the Process Manufacturing, Recreational Vehicle and Laboratory Operations IRC's 2019 Skills Forecast, and the Food, Beverage and Pharmaceutical Product Manufacturing IRC's 2019 Skills Forecast. These highlight the need for industry and occupation-specific skills (please note that the themes from these quotes are interspersed throughout many of the 2019 IRC Skill Forecasts).

Increasingly, employers are describing robotics and automation as imperatives for their businesses. Due to the likelihood that most manual processes will eventually be automated, employers are looking for laboratory services technicians, who are comfortable and practised in their use of automation. These workers will require higher skill levels to maximise the use of new technology. (Process Manufacturing, Recreational Vehicle and Laboratory Operations IRC's 2019 Skills Forecast)

The society and cultural influences on the laboratory operations industry include an ageing population, with an expected increase in demand for healthcare services. In turn, this is expected to drive higher demand for laboratory services. For example, NSW Health Pathology has trained over 35,000 operators in PoCT. It is the world's largest accredited managed PoCT service and currently has over 500 devices in more than 180 metropolitan, regional and rural hospital locations. (Process Manufacturing, Recreational Vehicle and Laboratory Operations IRC's 2019 Skills Forecast)

The food, beverage and pharmaceutical manufacturing industries operate in constantly changing environments driven by consumer demands and industry practices and innovations, with risk management a key focus in all operations. Operators and workers are faced with challenges in dealing with the consequences of international standards (including ISO), as well as policies and regulation that are driven at federal, state and territory levels, and by local governments and government agencies. (Food, Beverage and Pharmaceutical Product Manufacturing IRC's 2019 Skills Forecast)

Animal Care and Management and Racing industries

This case study includes two distinct industry clusters, both of which identified specific industry and occupation-related skills as priorities for their workforce:

- Animal Care and Management
- Racing.

The industry and occupation-related skills identified by these industries were:

- Animal Care and Management:
  - Ethical animal use
  - Animal awareness and behaviour
  - Emotional intelligence of animals
  - Foundational skills in animal care and management (focusing on the safety, health and welfare of animals, including handling, feeding, grooming, supervision, training and exercise)
  - Advanced skills in veterinary nursing, especially for care in crisis, emergency and serious situations.

- Racing:
  - Animal welfare
  - Integrity and ethical conduct.

The following quotes have been sourced from the Animal Care and Management IRC's 2019 Skills Forecast. These highlight the need for industry and occupation specific skills:

> *Working in animal care and management requires high-level skills and consumers are expecting more from those working within the industry.*

> *Both training and care skills will need to be enhanced to ensure the safe and effective training and utilisation of assistance animals. Assistance Animal Training Organisations are registered, and the expansion of assistance and therapy animal services is likely to increase the demand for skills in these areas.*

> *A few additional quotes from the Racing IRC's 2019 Skills Forecast highlight in more detail their priority skills, which are certainly very specific to the industry:*

> *Over the last few years, businesses have had to respond to challenges and opportunities in all related occupations, particularly in relation to the integrity of horse races, and social and workplace obligations in all classes of horse and greyhound racing. Racing businesses and RTOs have been required to embed numerous changes into their operations, including: safe horse riding and handling practices; revised and modernised racing practices including changes to traditional operational structures; greater support for 'new life after racing' options for retired animals.*

> *In each industry, the trainer faces ultimate responsibility for all industry integrity issues. The need for formal training and assessment, recognised by qualifications, Skills Sets and licensing, has grown with the increasing focus on social licence to operate and changing community standards, combined with expansion of fields covered by regulation and changing training skills.*

> *A particular concern over the last few years has been overbreeding and mistreatment of greyhounds. Greyhound racing clubs throughout Australia have set up programs to address overbreeding and encourage adoption of ex-racing dogs as family pets. Greyhounds Australasia announced its endorsement of a National Welfare Strategy in May 2014, and formal training is being developed to support these efforts.*

Adaptability skills

Overview

As demand for skills is constantly adapting to new technologies and job requirements, people will also need to enhance their ability to adapt to new situations and acquire new skills. As the world of work becomes more flexible, workers are expected to take more responsibility for their skills development.

Some of the ways in which industry need workers to be adaptable include:

- showing awareness of changes in the industry
- showing resilience and embracing change
- being adaptable in a changing industry, changing environments and changing markets
- adapting to new technologies and new ways of doing business
- showing a proficiency and willingness to learn
- being engaged in career development and planning
- maintaining skill relevancy, upskilling and multi-skilling
- responding to situations with flexibily and innovation
- showing innovation and creativity
- being entreprenurial.

Industry skills needs

Generic skills

In their 2019 Skills Forecasts, IRC's ranked a series of 12 generic skill categories, in priority order.

1 Learning agility / Information literacy / Intellectual autonomy and self-management
2 Communication / Virtual collaboration / Social intelligence
3 Design mindset / Thinking critically / Systems thinking / Problem solving
4 Technology use and application skills
5 Language, Literacy and Numeracy (LLN) skills
6 Managerial / Leadership skills
7 Customer service / Marketing skills
8 Science, Technology, Engineering, Mathematics (STEM) skills
9 Data analysis skills
10 Financial skills
11 Environmental sustainability skills
12 Entrepreneurial skills

Learning agility / Information literacy / Intellectual autonomy and self-management (which aligns directly with Adaptability) was, on average, the highest ranked generic skill (out of 12) across all Skills Forecasts.

Priority skills

In terms of specific references to these skills in the Forecasts, adaptability related skills were also identified to a moderately high degree by industries that reported on priority skills in their 2019 Skills Forecasts.

Moderately High

Priority level according to IRC Skills Forecasts

● Low   ● Moderate   ● Medium   ● Moderately high   ● High
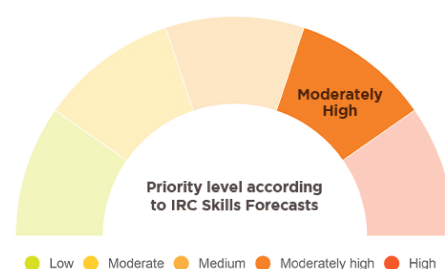
The three main adaptability related skills, which were identified most frequently within priority skills lists in Skills Forecasts were:

- **Emotional intelligence**, identified by the following industries:
  - Community Sector & Development
  - Direct Client Care and Support (Community Services & Health)
  - Personal Services
  - Ambulance and Paramedic
  - Children's Education and Care
  - Complementary Health
  - Enrolled Nursing
  - First Aid
  - Local Government

- **Resilience**, stress tolerance and flexibility, identified by the following industries:
  - Community Sector & Development
  - Direct Client Care and Support (Community Services & Health)
  - Personal Services
  - Aboriginal and Torres Strait Islander Health Workers
  - Children's Education and Care
  - Dental
  - Enrolled Nursing
  - Technicians Support Services
  - Tourism, Travel and Hospitality
  - Retail and Wholesale
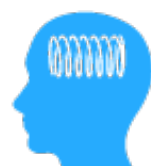
- **Self management**, identified by the following industries:
  - Community Sector & Development
  - Direct Client Care and Support (Community Services & Health)
  - Personal Services
  - Aboriginal and Torres Strait Islander Health Workers
  - Ambulance and Paramedic
  - Complementary Health
  - Dental
  - First Aid
  - Technicians Support Services
  - Tourism, Travel and Hospitality
  - Client Services
  - Sport, Fitness and Recreation.

Additionally, 'Use of new technologies and materials' and 'Changing skill needs arising from new technology' were identified by Recreational Vehicles and Textiles, Clothing and Footwear, and the Education Industry identified 'Demonstrating an ability to adapt to changes and continuously deliver high quality training' and 'Undertaking and applying research to training practice'.

Internet job postings

Internet job vacancy postings that contained requests for adaptability skills were examined for occupational trends. This includes change management, process improvement, problem solving and creativity. The chart below compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested adaptability skills.

Internet job postings that requested adaptability skills, by occupation (2016-19)
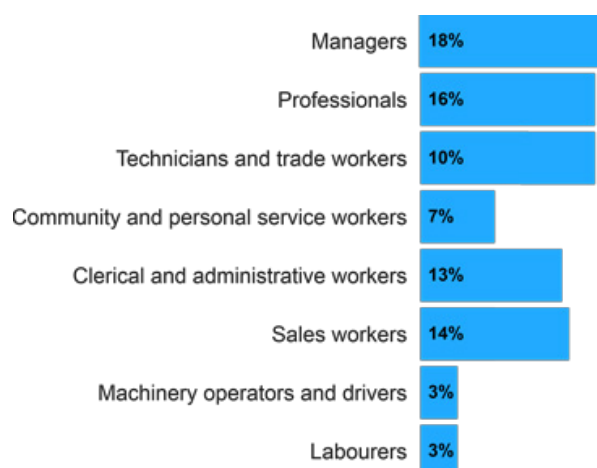
Occupation	Percentage
Managers	18%
Professionals	16%
Technicians and trade workers	10%
Community and personal service workers	7%
Clerical and administrative workers	13%
Sales workers	14%
Machinery operators and drivers	3%
Labourers	3%

Source: Burning Glass Technologies' Labor Insight™ Real-time Labor Market Information tool.

Adaptability skills were most often requested for managerial and professional possitions, and least often for labourers, machinery operators and drivers.

The following graphic shows examples of occupations where adaptability skills are highly requested, and some examples of the types of requests employers are making for those in these occupations
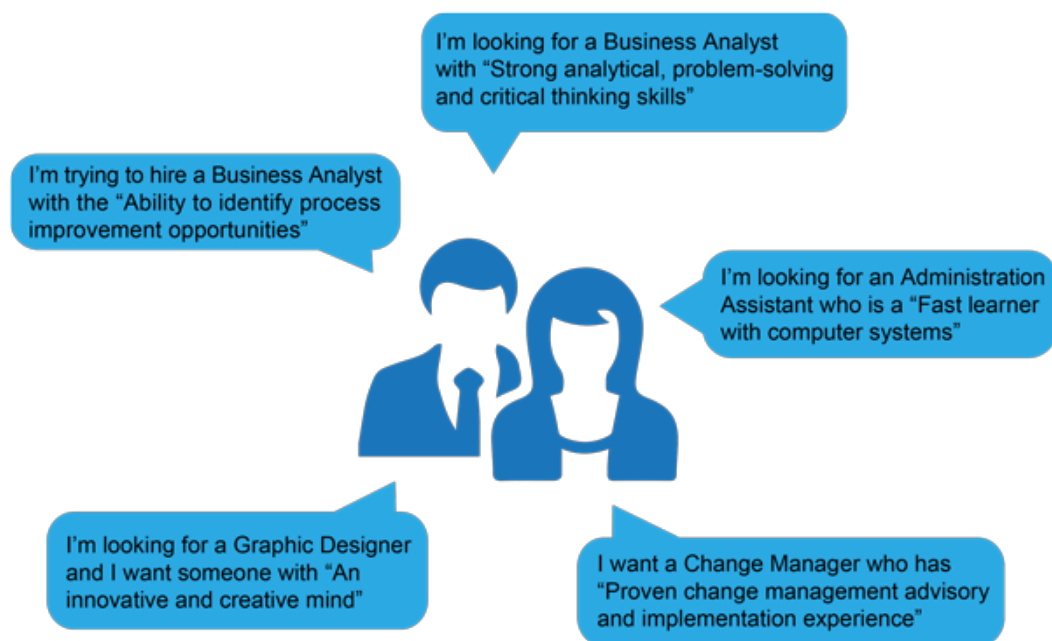
When asking for adaptability skills from potential employees, postings often ask for the ability to cope with or lead change, as well as learning quickly on the job. The rate of change in many industries is likely one reason for these requests.

Case studies

Community Services

The Community Services sector is one component of the Community Sector and Development industry, and provides support to individuals, families and groups, enabling them maximise their potential and to enhance community wellbeing. Community support services are diverse and range from care and information activities to referrals and interventions. The workforce encompasses a diverse range of job roles and functions which are multi-levelled as well as requiring multiple skill areas, often overlapping with other sectors such as housing, health, education, aged services and disability.

The Community Sector and Development IRC's 2019 Skills Forecast identifies the three main adaptability related skills 'emotional intelligence', 'resilience, stress tolerance and flexibility' and 'self-management' as essential skills for the Community Services workforce. This is highlighted in the following quotes taken from the forecast:

> Whilst technical skills to perform job tasks are imperative, employers in the short-to-medium future will be looking beyond this and have indicated that it will be important for workers in their organisations to be equipped with key soft skills: teamwork and communication, emotional intelligence, resilience, stress tolerance and flexibility and self-management.

> The development of skills in caseload management, including self-management, resilience and emotional intelligence, is critically important for community services workers.

Education

The education industry is broad, encompassing the teaching of primary, secondary, vocational and higher education roles. Within this industry, the vocational education and training (VET) sector contributes to the growth of Australian businesses by preparing workers with the skills that industry needs, providing training to potential and current workers in almost every industry in the Australian economy. The Training and Education (TAE) and Foundation Skills (FSK) Training Packages are critical elements of the Australian training system, playing central roles in the training of all learners that engage in the vocational education and training (VET) sector.

The Education IRC's Skills Forecast has identified adaptability as an essential skill for VET sector workers, which is highlighted in the following quotes from the skills forecast:

> *In addition to specialised skills in subject areas, key current competency needs for VET sector workers include...demonstrating an ability to adapt to changes and continuously deliver high quality training and undertaking* [and] *applying research to training practice.*

> [The] *increasing diversity* [of learner groups] *requires VET practitioners to have the capabilities to understand individual learner needs and implement person-centred strategies to meet them. This requires an emphasis on interpersonal skills in the midst of the technical application of training and assessment capabilities.*

Analytical skills

Overview

Data is becoming increasingly available, with 'big data' being derived from online activity, sensors, the 'internet of things', new analytical tools, and artificial intelligence. Workers in almost all industries, and across most roles, will be expected to use available data to derive value, and improve products and services. This may require the ability to analyse and present raw data or to interpret data analysis and apply findings.

While data analytical skills are increasingly important, other skills such as data management, information literacy, problem solving, critical thinking and creative thinking skills are also required by industries.

The cross-sector project, **Big Data**, reviews current and emerging developments in big data skills, particularly in relation to data management, data analytics and data-driven decision-making, and identifies the related skills needs shared by multiple industry sectors.

Cross sector projects

Industry skills needs

Generic skills

In their 2019 Skills Forecasts, IRC's ranked a series of 12 generic skill categories, in priority order.

1 Learning agility / Information literacy / Intellectual autonomy and self-management

2 Communication / Virtual collaboration / Social intelligence

3 Design mindset / Thinking critically / Systems thinking / Problem solving

4 Technology use and application skills

5 Language, Literacy and Numeracy (LLN) skills

6 Managerial / Leadership skills

7 Customer service / Marketing skills

8 Science, Technology, Engineering, Mathematics (STEM) skills

9 Data analysis skills

10 Financial skills

11 Environmental sustainability skills

12 Entrepreneurial skills

The generic skills category focused around Design mindset / Thinking critically / Systems thinking / Problem solving aligns with Analytical skills, and received an average ranking of 3rd (out of 12) across all Skills Forecasts.

RANKED 3RD **3**

Data analysis skills, another generic skills category associated with Analytical skills, received an average ranking of 9th (out of 12) across all IRC Skills Forecasts.

RANKED 9TH **9**

Priority skills

Analytical skills were also identified to a moderately high degree by industries that reported on priority skills in their 2019 Skills Forecasts.

Moderately High

Priority level according to IRC Skills Forecasts

● Low ● Moderate ● Medium ● Moderately high ● High
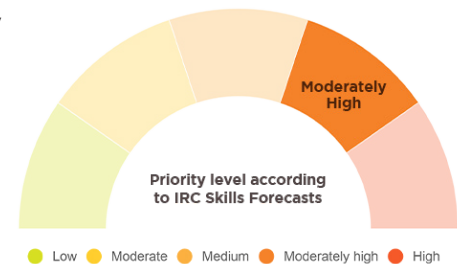
The two analytical skills identified most frequently were:

- **Critical thinking,** identified by the following industry sectors:
  - Arts, Culture, Entertainment and Design
  - Dance
  - Business Services
  - Children's Education and Care
  - Government
  - Ambulance and Paramedic
  - Complementary Health
  - Enrolled Nursing
  - Printing and Graphic Arts
  - Retail and Wholesale.

- **Problem solving**, identified by the following industry sectors:
  - Arts, Culture, Entertainment and Design
  - Dance
  - Automotive
  - Business Services
  - Children's Education and Care
  - Client Services
  - Direct Client Care and Support
  - Financial Services
  - Aboriginal and Torres Strait Islander Health Workers
  - Ambulance and Paramedic
  - Complementary Health
  - Dental

- First Aid
- Technicians Support Services
- Information and Communications Technology
- Mining, Drilling and Civil Infrastructure
- Printing and Graphic Arts
- Retail and Wholesale
- Sport, Fitness and Recreation
- Tourism, Travel and Hospitality.

Internet job postings

Internet job vacancy postings that contained requests for analytical skills were examined for occupational trends. This includes problem solving, critical thinking, troubleshooting, research and data an`alysis. The chart below compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested analytical skills.

Internet job postings that requested analytical skills, by occupation (2016-19)

Occupation	Percentage
Managers	20%
Professionals	23%
Technicians and trade workers	13%
Community and personal service workers	7%
Clerical and administrative workers	17%
Sales workers	13%
Machinery operators and drivers	5%
Labourers	5%

Source: Burning Glass Technologies' Labor Insight™ Real-time Labor Market Information tool.

Analytical skills were most often requested for professional, managerial or clerical and administrative positions They were rarely requested for machinery operations or driving, labouring or community and personal service postions. This suggests positions that employers belive require these skills are more restricted, and usually involve the direct use of these skills in a technical positon.

The following graphic shows examples of occupations where analytical skills are highly requested, and some examples of the types of requests employers are making for those in these occupations.

There are a range of technical occupations for which analytical skills are commonly requested, from data and business analysts to medical and marketing related occupations. Businesses are eager to take advantages of analytical and data-based insights in order to improve.

Case Studies

Information and Communications Technology

The Information and Communications Technology industry consists of the five sectors listed below. Each identified analytical and related skills as a top priority for their workforce to keep pace with the rapid evolution of technology.

- Digital media
- ICT networks
- ICT operations and support
- Programming, Software and Web Development
- Telecommunications technology

The need for analytical and related skills are highlighted by the following quotes from the Information and Communication Technology IRC's 2019 Skills Forecast:

> In ICT – and many other sectors – employers are demanding skills that will deliver on the promises of new and emerging technologies, including advanced skills in data analytics, software engineering and cloud computing.

> It is anticipated that ICT job roles and skills will be necessary to harness the potential of new and emerging technologies. This includes highly specialised skills, such as in data analytics and software engineering to design, develop and implement new technology, as well as digital literacy, creativity and communication skills to work effectively in future economy that is set to be more automated and digitally connected than ever before.

Financial Services

The Financial Services industry in Australia is large and includes the following sectors:

- Banking
- Mortgage broking
- Financial markets
- Financial planning and advice
- Insurance
- Superannuation
- Accounting and bookkeeping
- Mercantile agents
- Trust administration.

All sectors identified the need for analytical and related skills in their workforce, to better understand the requirements of their clients or improve internal operations in the business. This is highlighted by the following quotes, sourced from the Financial Services IRC's 2019 Skills Forecast:

> *Additionally, proficiency in computing skills, strong analytical skills, and adaptability to understand and embrace new technologies and work environments will enable workers in order to better prepare them for changing industry demands, particularly in the FinTech space with the increasing digitisation of products, platforms, and services.*

> *There are also increased considerations for mortgage brokers to be aware of in regards to data management and protection, due to the level of personal information collected and stored electronically.*

> *Advances in technology have improved access to customer information and improved processes, and also raise a need for data related training.*

Business & compliance skills

Overview

Business and compliance encompasses the broad range of skills industry require to run a successful business, to understand relevant regulatory requirements and to maintain compliance.

Though there are many business skills required to be a successful business leader, key skills may include sound financial and project management skills, the ability to plan, and effectively manage resources. Understanding the regulatory environment in which the industry is operating is also necessary, to ensure that the company adheres to industry standards and rules, follows internal compliance guidelines, and maintains dialogue with regulatory bodies for the industry.

The project **Supply chains** is examining the implications of major changes underway across, and within, supply chains due to the impact of automation, robotics, big data and other new technologies. The skills needed to support innovation and new technologies will be the key to the future success of industry throughout the supply chain.

This project is one of nine **cross-sector projects** being undertaken by the Australian Industry and Skills Committee, to address common skills needs, minimise duplication, and consolidate existing training units.

Cross sector projects

Industry skills needs

In their 2019 Skills Forecasts, IRC's ranked a series of 12 generic skills categories, in priority order.

1 Learning agility / Information literacy / Intellectual autonomy and self-management

2 Communication / Virtual collaboration / Social intelligence

3 Design mindset / Thinking critically / Systems thinking / Problem solving

4 Technology use and application skills

5 Language, Literacy and Numeracy (LLN) skills

6 Managerial / Leadership skills

7 Customer service / Marketing skills

8 Science, Technology, Engineering, Mathematics (STEM) skills

9 Data analysis skills

10 Financial skills

11 Environmental sustainability skills

12 Entrepreneurial skills

Financial skills (which are a key component of business and compliance skills) received an average ranking of 10th (out of 12) across all skills forecasts.

Priority Skills

Business and compliance skills were also identified to a moderately high degree by industries that reported on priority skills in their 2019 Skills Forecasts.

Priority level according to IRC Skills Forecasts

● Low ● Moderate ● Medium ● Moderately high ● High
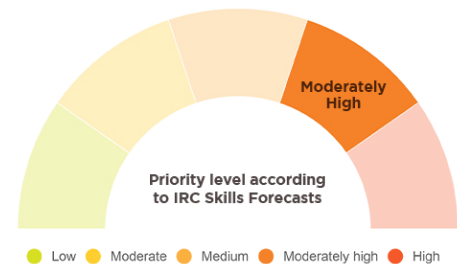
The four broad areas of business and compliance skills identified most frequently were:

- **Regulatory/Legislative/Compliance**, identified by the following industry sectors:
    - Food, Beverage and Pharmaceutical Product Manufacturing
    - Gas
    - Transport and Logistics
    - Education
    - Textiles, Clothing and Footwear

- **Health and Safety**, identified by the following industry sectors:
    - Food, Beverage and Pharmaceutical Product Manufacturing
    - Gas
    - Aviation
    - Maritime
    - Transport and Logistics
    - Correctional Services
    - ESI Generation
    - Electrotechnology
    - Water
    - Automotive
    - Corrections and Public Safety
    - Dance
    - ESI Transmission, Distribution and Rail
    - Financial Services
    - Information and Communications Technology
    - Mining, Drilling and Civil Infrastructure
    - Printing and Graphic Arts
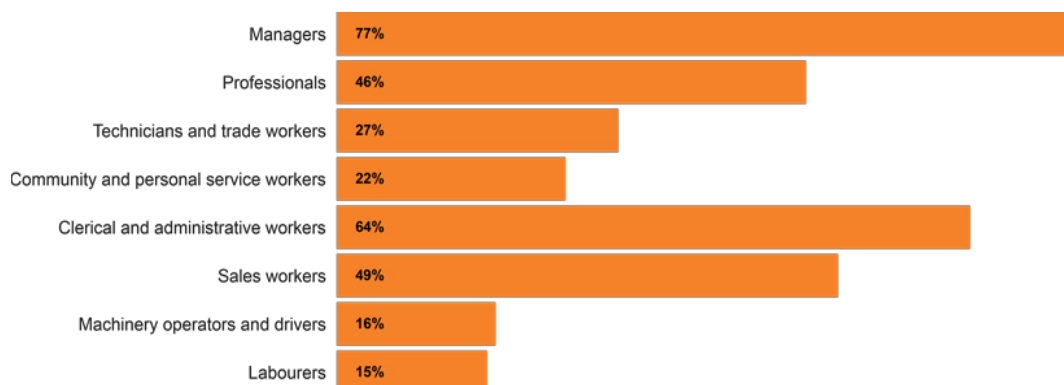   - Process Manufacturing
    - Rail

- **Risk Management**, identified by the following industry sectors:
  - Food, Beverage and Pharmaceutical Product Manufacturing
  - Maritime
- **General business skills** (for example, financial, organisational, planning, operational), identified by the following industry sectors:
  - Gas
  - Aviation
  - Maritime
  - Transport and Logistics
  - Business services
  - ESI Generation
  - Water
  - Forestry and wood products
  - Furnishing
  - Textiles, Clothing and Footwear

Internet job postings

Internet job vacancy postings that contained requests for business and compliance skills were examined for occupational trends. This includes planning, prioritising tasks, business presentations and organisational skills. The chart below compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested business and compliance skills.

Internet job postings that requested business and compliance skills, by occupation (2016-19)

Occupation	Percentage
Managers	77%
Professionals	46%
Technicians and trade workers	27%
Community and personal service workers	22%
Clerical and administrative workers	64%
Sales workers	49%
Machinery operators and drivers	16%
Labourers	15%

Source: Burning Glass Technologies' Labor Insight™ Real-time Labor Market Information tool.

Business and compliance skills were most often requested for managers and clerical and administrative workers, and were least often requested for machinery operators and drivers, and labourers. Professionals also had higher rates of these skills requested.

The following graphic shows examples of occupations where business and compliance skills are highly requested, and some examples of the types of requests employers are making for those in these occupations.

I need a Project Manager with "Five or more years of business experience in strategic and operations planning and/or business analysis"

I'm searching for an Account Manager with the ability to "Prepare new business presentations to meet business growth targets

I'm looking for a Financial Accountant with "Relevant experience in financial accounting and generalised experience covering accounts payable, receivable and reconciliations"

I need a Business Analyst with "Demonstrable experience in an analytical business partnering role"

I'm recruiting for an Executive Assistant with "The ability to prioritise and work effectively under tight deadlines"

Skills in this area are often more relevant to those working in management positions or who are otherwise asked to input on business strategy. Many job postings reference the need for experience working within a business environment.

Case Studies

Transport industry cluster

The Transport industry plays a key role in enabling Australia's economic activity. Without the capacities and capabilities provided by the Transport industry, no passengers or freight would move. The industry comprises four sectors:

- Transport and Logistics
- Maritime
- Rail
- Aviation.

Work health and safety, and compliance skills (or a combination of both) were reported in the IRC Skills Forecasts for each of these sectors. These quotes highlight why business and compliance skills have been prioritised in the Transport industry cluster:

> *New Chain of Responsibility (CoR) regulations are aimed at improving safety. The newly amended CoR laws obligate all supply chain participants to ensure safety measures are implemented to prevent speeding, driver fatigue, and breach of Heavy Vehicle National Law (HVNL). New education and training help meet the compliance requirements. The industry workforce will require skills to think critically and creatively to solve problems and respond to unforeseen situations.* (Transport and Logistics IRC)

Emergency towage is an important part of the Maritime industry operations. It is responsible for assisting a vessel that is damaged or in danger of grounding, sinking, or causing environmental hazards. The industry requires a skilled workforce capable of managing and conducting towage operations effectively to meet regulatory requirements. (Maritime IRC)

Safety in the Rail industry is of paramount importance as the industry moves millions of people daily. Harmonising rail safety standards and developing effective national standards and codes of practice are key focus areas to improve industry's safety and efficiency. The Office of the National Rail Safety Regulator (ONRSR) has deemed safety of workers and vehicles a key priority in their 2016-17 annual report. ONRSR is also undertaking a project to make informed safety decisions based on risk-based regulatory intelligence and data to improve compliance and mitigate risks. (Rail IRC)

New technologies and the ongoing regulatory changes will require regular revision of the Training Package to ensure a skilled and adaptable workforce. (Aviation IRC)

Collaboration skills

Overview

Interpersonal skills are highly sought after in many industries. Those able to collaborate and share information are best able to adapt to changing markets and technologies, interact in diverse workplaces, and effectively respond to customer needs.

As organisations become increasingly dynamic and horizontally structured, collaboration skills are needed across all types of roles, to help businesses improve efficiency and achieve organisational goals.

Communication and collaboration tools will evolve, and Australian workers will need to be skilled in new media literacies, for example communication through social media.

Skills that enhance collaboration include communication and teamwork skills, active listening, social perceptiveness, relationship management, and social and cultural awareness.

Industry skills needs

Generic skills

In their 2019 Skills Forecasts, IRC's ranked a series of 12 generic skill categories, in priority order.

1 Learning agility / Information literacy / Intellectual autonomy and self-management
2 Communication / Virtual collaboration / Social intelligence
3 Design mindset / Thinking critically / Systems thinking / Problem solving
4 Technology use and application skills
5 Language, Literacy and Numeracy (LLN) skills
6 Managerial / Leadership skills
7 Customer service / Marketing skills
8 Science, Technology, Engineering, Mathematics (STEM) skills
9 Data analysis skills
10 Financial skills
11 Environmental sustainability skills
12 Entrepreneurial skills

Communication / Virtual collaboration / Social received an average ranking of 2nd (out of 12) across all skills forecasts.

RANKED 2ND

Priority skills

Collaboration skills were also identified to a high degree by industries that reported on priority skills in their 2019 Skills Forecasts.

Priority level according to IRC Skills Forecasts

High

● Low ● Moderate ● Medium ● Moderately high ● High
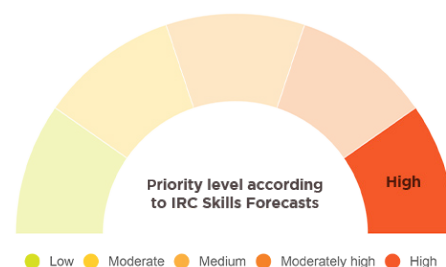
The collaboration skills identified most frequently were:

- **Teamwork and communication**, identified by the following industry sectors:
  ○ Arts, Culture, Entertainment and Design
  ○ Dance
  ○ Automotive
  ○ Business Services
  ○ Children's Education and Care
  ○ Client Services
  ○ Community Sector & Development
  ○ Direct Client Care and Support
  ○ Financial Services
  ○ Food, Beverage and Pharmaceutical Product Manufacturing
  ○ Government
  ○ Aboriginal and Torres Strait Islander Health Workers
  ○ Ambulance and Paramedic
  ○ Complementary Health
  ○ Dental
  ○ Enrolled Nursing
  ○ First Aid
  ○ Technicians Support Services
  ○ Information and Communications Technology
  ○ Mining, Drilling and Civil Infrastructure
  ○ Personal Services
  ○ Graphic Arts
  ○ Sport, Fitness and Recreation
  ○ Tourism, Travel and Hospitality

- **Social perceptiveness**, identified by the following industry sectors:
  ○ Business Services
  ○ Cultural Competence
  ○ Retail and Wholesale

- **Customer service**, identified by the following industry sectors:
  ○ Arts, Culture, Entertainment and Design
  ○ Dance
  ○ Furnishing
  ○ Printing and Graphic Arts

Internet job postings

Internet job vacancy postings that contained requests for communications skills were examined for occupational trends. This includes skill in building relationships, different types of communication and listening, team building and negotiation. The chart below compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested collaboration skills, incluing communication.

Internet job postings that requested collaboration skills, by occupation (2016-19)

Occupation	%
Managers	52%
Professionals	43%
Technicians and trade workers	30%
Community and personal service workers	37%
Clerical and administrative workers	52%
Sales workers	48%
Machinery operators and drivers	21%
Labourers	21%

Source: Burning Glass Technologies' Labor Insight™ Real-time Labor Market Information tool.

Collaboration skills were most often explicitly requested for managerial and profressional positions, and least often for machinery operation or labouring positions. This suggests emplyoers find it more important to ensure these skills in those who will need to manage and communicate with a team.

The following graphic shows examples of occupations where collaborations skills are highly requested, and some examples of the types of requests employers are making for those in these occupations.

I'm looking for a Project Manager with "Excellent client-facing and internal communication skills"

I'm looking for an Executive Assistant with "Excellent written and verbal communication skills"

I'm looking for a Business Development Manager with "Excellent relationship building skills and expertise in customer liaison and management"

I'm looking for a Customer Service Officer with "Excellent communication and listening skills"

I'm looking for a Team Leader with "Highly developed cultural awareness and sensitivity"

Employees are looking for individuals who can communicate both internally and externally in a range of formats. These skills are often mentioned for positions such as project manager, where there will be a need to collaborate with an internal team while also communicating with an external client.

Case Studies

Community Services

The Community Services industry includes workers involved in the sectors of Children's Education and Care, Client Services, Community Sector and Development, and Direct Client Care and Support. These sectors encompass workers who provide a variety of care and support services for a range of community members, including the more vulnerable and less able.

These subsectors are not mutually exclusive in the services they provide, and increasingly the collaboration of people across subsectors is a critical element in individual care and support plans.

Collaboration includes skills relating to teamwork and communication, and the ability to connect with others.

The following quotes from the different Community Services 2019 Skills Forecasts highlight the importance of collaboration skills, including teamwork and communication, for the workforce:

> *In addition to increased skills demand relating to chronic health conditions such as mental health and alcohol and other drugs, there are also deficiencies in skills related to dementia care, palliative care, technological and interpersonal skills (such as communication), most noticeably in the aged and disability care sectors.* (Direct Client Care IRC)

> *Perhaps more significant to job roles in the Children's Education and Care sectors is that they have always required strong communication and emotional intelligence skills. The ability to engage with children is a fundamental practical skill with unique factors in the work context. Consultation in relation to the update of existing Training Package Products is highlighting the significance of skills relating to reflection and the role these play in translating theory into practice and the ongoing professional development of educators. Skills such as these can be enhanced over time with practical application and communication with peers and leaders within the workplace.* (Children's Education and Care IRC)

> *Job seekers may experience disadvantage in the labour market due to various factors, including disability, mental health issues, age, ethnicity and language. Addressing these barriers can include discussing homelessness, family violence, literacy, motivation and confidence, and numerous other non-vocational support issues. As a result, frontline employment consultants require excellent communication skills, as well as time management skills and an awareness of the policy landscape, to effectively provide opportunities for clients on a case-by-case basis.* (Client Services IRC)

Tourism, Travel and Hospitality

The Tourism, Travel and Hospitality industry comprises of the 'people-facing' industry sectors involving tourism, travel, events and exhibitions, accommodation (including hotels, holiday parks and resorts) and hospitality.

These sectors are intrinsically linked and when combined, form one of the largest economic industries in Australia. The strong association and interconnectedness between the five sectors mean that trends and changes in one, will consequently impact the others. As a result, collaboration between sectors is imperative to the success of the industry as a whole.

The quotes below sourced from the Tourism, Travel and Hospitality IRC's 2019 Skills Forecast, demonstrate the importance of collaboration for this workforce, including the ability to communicate and work as a team:

> *Key skills and knowledge gaps voiced by industry as a priority for development in the future workforce are: communication, teamwork, self-management, resilience and business/commercial skills as well as product and service knowledge. For example, demand for cultural tourism, particularly that related to learning about Aboriginal beliefs and connections to the land ('country') is growing and workforce skills development is essential to ensure Australia can provide an authentic experience to visitors.*

> *To achieve growth and success, access to a highly skilled and knowledgeable workforce is fundamental. The sectors however are experiencing significant challenges in accessing and retaining skilled workers. Enrolments in relevant VET qualifications have fallen over the last two reported years (2016 and 2017), and employers are indicating graduates are not equipped with key skills. Some of the common skills and knowledge areas industry has reported shortages in include communication, teamwork and problem-solving.*

Customer Service & Marketing Skills

Overview

Approaches to customer service, marketing and communication are evolving, with social platforms increasing in prevalence.

As such, the workforce will need to become skilled in new media literacies in order to engage with customers and achieve sales and marketing targets.

There is a current cross-sector project underway looking at developing **Consumer Engagement through Social and Online Media** to improve social platform & marketing skills.

Cross sector projects

Industry skills needs

Generic skills

In their 2019 Skills Forecasts, IRC's ranked a series of 12 generic skill categories, in priority order.

1 Learning agility / Information literacy / Intellectual autonomy and self-management

2 Communication / Virtual collaboration / Social intelligence

3 Design mindset / Thinking critically / Systems thinking / Problem solving

4 Technology use and application skills

5 Language, Literacy and Numeracy (LLN) skills

6 Managerial / Leadership skills

7 Customer service / Marketing skills

8 Science, Technology, Engineering, Mathematics (STEM) skills

9 Data analysis skills

10 Financial skills

11 Environmental sustainability skills

12 Entrepreneurial skills

Customer service / Marketing (which aligns directly with Customer Service & Marketing skills) received an average ranking of 7th (out of 12) across all skills forecasts

RANKED 7TH

Priority skills

Customer Service & Marketing skills were also identified to moderate degree by industries that reported on priority skills in their 2019 Skills Forecasts.

Moderate

Priority level according to IRC Skills Forecasts

● Low ● Moderate ● Medium ● Moderately high ● High
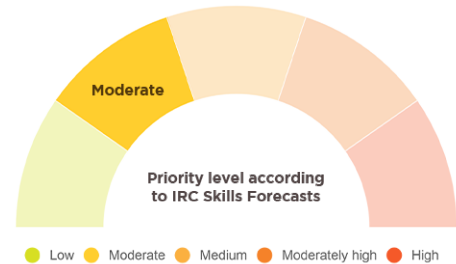
The following industries identified Customer Service & Marketing skills as a priority in their IRC Skills Forecasts:

- Arts, Culture, Entertainment and Design
- Client Services
- Corrections and Public Safety

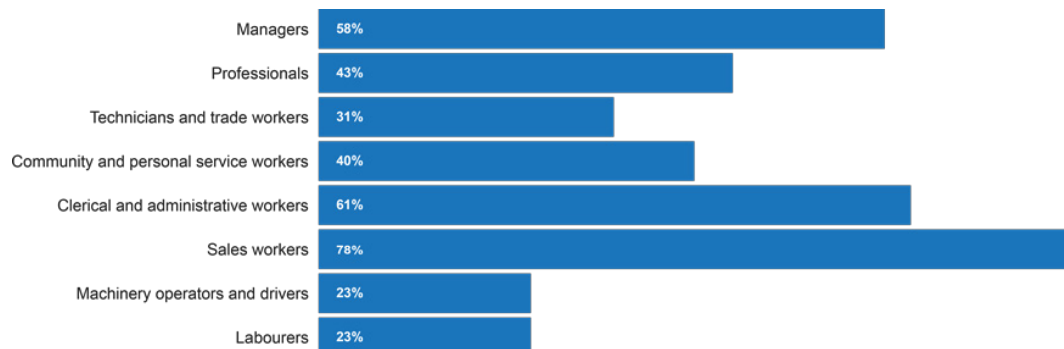These industries focused mainly on the need for skills relating to:

- Self-promotion and marketing
- Online and social media
- Community engagement.

Internet job postings

Internet job vacancy postings that contained requests for customer service & marketing skills were examined for occupational trends. This includes skills related to sales, telephone marketing, social media and communication. The chart below compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested customer service & marketing skills.

Internet job postings that requested customer service and marketing skills, by occupation (2016-19)

Occupation	Percentage
Managers	58%
Professionals	43%
Technicians and trade workers	31%
Community and personal service workers	40%
Clerical and administrative workers	61%
Sales workers	78%
Machinery operators and drivers	23%
Labourers	23%

Source: Burning Glass Technologies' Labor Insight™ Real-time Labor Market Information tool.

Unsurprisingly, customer service & marketing skills were most often requested for sales workers, with 78% of postings for these occupations containing at least one skill. Clerical and administrative workers and managers also had higher rates of customer services and marketing skills requested. Labourers, machinary operators and drivers and technicians and trade workers had lower rates of these skills requested, suggesting these occupations are less often customer facing.

The following graphic shows examples of occupations where customer service & marketing skills are highly requested, and some examples of the types of requests employers are making for those in these occupations.

I'm looking for a Sales Representative with "Experience in business to business sales"

I'm searching for a Business Development Manager with "Excellent relationship building skills and experience in customer liaison and management"

I'm trying to recruit a Customer Services Officer with "Persuasive communication skills"

I need a Marketing Coordinator with "Experience managing social media"

I'm looking for a Marketing Manager with "Extensive business to business and business to customer experience"

As well as the general communication and sale skills, employees are requesting the ability to work with new social media technology such as Instagram and Facebook. For higher level positions there is interest in those who have used their skills in different contexts, such as both sales from businesses to other business and directly to customers.

Case Studies

Arts, Culture, Entertainment and Design Industry

The Arts, Culture, Entertainment and Design industry includes a wide range of individuals and organisations who contribute to the creative economy, and is made up of four distinct sectors:

- Live performance and entertainment: dance and musical theatre, dance teaching, and live production and technical services
- Music: music performance and composition, music sound production, and music business
- Screen, media and broadcasting: broadcast technology, and technical screen and media production
- Visual arts, craft and design: subspecialties across a range of visual art disciplines

According to the Culture and Related Industries IRC's 2019 Skills Forecast, customer engagement through online and social media is a imperative skill for workers within this industry, primarily as these workers often are sole operators and need the skills to communicate and engage directly with their customers (and audiences).

The need for customer service & marketing skills are ever increasing with the growth of social media as a platform to promote, distribute and sell art to a wide range of audiences. In addition, the evolution and growth of the gig economy presents a need for artists to be skilled in self-managing their careers as freelance workers.

According to the Culture and Related Industries IRC's 2019 Skills Forecast, the following changes are expected to impact skills needs for workers:

> *Artists, art dealers and galleries utilise technology and social media platforms to promote and distribute art, allowing them to reach a greater range of consumers. For example, 91 per cent of galleries surveyed said that they actively use social media to promote their gallery, art and artists. Therefore, workers in the sector require the skills and knowledge to establish a digital presence, engage audiences through digital platforms, and distribute and promote art.*

> *The changes to the landscape of freelancing work will affect the Culture and Related Industries in different ways based on sub-sector and specific job roles. In some areas it may be prevalent, for example, more visual arts, craft and design professionals, have chosen to self-manage their career rather than to depend on galleries or other third parties to help with management.*

Client Service Sector

The Client Services sector provides an array of essential services to the Australian public, services which are generally provided across the wider Community Services sector, and include:

- Career development
- Employment services
- Counselling
- Financial counselling
- Family dispute resolution
- Celebrancy.

According to the Client Services IRC's 2019 Skills Forecast, the widespread use of social media and online activities signifies the importance of establishing and maintaining a profile on social media amongst the Client Services sector:

> *Due to the mass-adoption of online and social media by the general public, it is important for almost every industry today to establish and maintain a high profile on social media. Online and social media is applicable to, and provides benefits to, the Client Services sector, and there is therefore a need for students to develop online and social media skills to aid in their work-readiness.* (Client Services IRC's 2019 Skills Forecast)

These skills are of particular importance for celebrants. As highlighted in the Skills Forecast, Commonwealth-registered marriage celebrants are required to undertake mandatory ongoing professional development each year, and this can include activities relating to customer service and marketing skills, such as:

- Social media marketing
- Knowing how to create appropriate social media content
- Creating and maintaining a social media presence
- Social media as a marketing tool
- Networking using social media.

Digital skills

Overview

The current explosion in new technologies is reinventing much of the way businesses are run. This has significant implications for the workforce, which needs to evolve and be agile to keep up with this technological expansion.

Digital skills, which are becoming increasingly important and a priority for many industries, can include:

- coding and programming
- developing and using robotic and automation technologies
- leveraging information and communication technologies (ICT) skills in business
- exploring the world of cloud computing and the Internet of Things.

The Australian Industry and Skills Committee (AISC) is in the process of establishing an **Industry 4.0 Industry Reference Committee**, to help ensure vocational education and training gives students the future-focussed skills they will need, as workplaces become radically transformed by increased automation and digitalisation.

There are currently five AISC **cross-sector projects** relating to the impact of technological advances on the workforce. They aim to address common skills needs, minimise duplication and consolidate existing training units. Projects include:

- looking at developing **Digital skills** across industries

- looking at the workforce skilling implications in relation to the use of Automation, namely robotics, drones and remote operation systems

- examining the implications of the major change underway across and within **Supply chains** due to the impact of automation, robotics, big data and other new technologies

- reviewing current and emerging developments in **Cyber security** skills, particularly in relation to data confidentiality, protection and privacy, and identify related skills needs shared by multiple industry sectors

- the purpose of the **Big data** project is to provide an evidence-based case and industry support for developing vocational training in big data and big data analytics skills that can be transferable across multiple industries.

Industry skills needs

Generic skills

In their 2019 Skills Forecasts, IRC's ranked a series of 12 generic skill categories, in priority order.

1 Learning agility / Information literacy / Intellectual autonomy and self-management
2 Communication / Virtual collaboration / Social intelligence
3 Design mindset / Thinking critically / Systems thinking / Problem solving
4 Technology use and application skills
5 Language, Literacy and Numeracy (LLN) skills
6 Managerial / Leadership skills
7 Customer service / Marketing skills
8 Science, Technology, Engineering, Mathematics (STEM) skills
9 Data analysis skills
10 Financial skills
11 Environmental sustainability skills
12 Entrepreneurial skills

Technology use and application skills (which aligns with Digital skills) received an average ranking of 4th (out of 12) across all skills forecasts

RANKED 4TH

Priority skills

Digital skills were also identified by around half of the industries that reported on.priority skills in their 2019 Skills Forecasts.

Priority level according to IRC Skills Forecasts

Low ● Moderate ● Medium ● Moderately high ● High
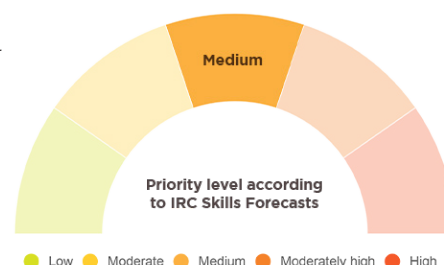
The digital skills identified by the industry skills forecasts could be split broadly into two main categories:

- **Digital skills relating to industry specific software or technology**, identified by the following industries:
  - Business Services
  - Electricity Supply Generation
  - Electricity Supply Transmission, Distribution and Rail
  - Furnishing
  - Process Manufacturing (PMA).

- **General digital skills and literacy**, identified by the following industries:
    - Correctional Services
    - Forestry and Wood Products
    - Gas
    - Maritime
    - Mining, Drilling and Civil Infrastructure
    - Rail
    - Transport and Logistics
    - Water.

Internet job postings

Internet job vacancy postings that contained requests for digital skills were examined for occupational trends. This includes requests for specific techinical skills such as experience in Microsoft Office software, Adobe Photoshop or SQL, as well as general requests for computer literacy, software development or data entry. The following chart compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested digital skills.

Internet job postings that requested digital skills, by occupation (2016-19)

Occupation	Percentage
Managers	20%
Professionals	30%
Technicians and trade workers	16%
Community and personal service workers	9%
Clerical and administrative workers	41%
Sales workers	18%
Machinery operators and drivers	10%
Labourers	5%

Source: Burning Glass Technologies' Labor Insight™ Real-time Labor Market Information tool.

Computer skills were requested most frequently for clerical, administrative and professional occuptaions, and least often for community or personal service workers and labourers. This suggests that most clerical and administrative jobs will involved frequect use of digital technology. Job postings will often specify the type of digital technology that will be used, with Microsoft Office products such as Word, Excel or Powerpoint the most common.

The following graphic shows examples of occupations where digital skills are highly requested, and some examples of the types of requests employers are making for those in these occupations.

There are two broad occupation types where digital skills are often requested – non-IT focused occupations where digital skills are often for more basic or broad tasks, and IT professions where high levels of specific digital skills are needed.

Case Studies

Business Services

The Business Services industry is involved in the operation and management of businesses, and as such it is not an independent industry; rather all Australian industries include workers in Business Services. The industry includes the sub-sectors:

- Business Administration and Governance
- Business Communication
- Business Leadership and Management
- Specialised Business Services.

The skills forecast identifies 'Data literacy' and 'Digital competence' as two of the five key enterprise, or transferrable, skills required by Business Services workers. These are described by the following quotes from the skills forecast as:

Data literacy – Data literacy is the ability to derive meaningful insights from data. Workers across the Business Services sector have access to more and more data, with a growing emphasis being placed on data-driven decision making. These skills enable a person to effectively identify, locate, interpret, and evaluate information to produce business insights.

Digital competency – including skills relating to: cyber security and use of technology to perform tasks. A digitally competent person is able to use new and emerging platforms and digital technologies in a business environment. These systems are used safely and critically, and may enable digital or virtual collaboration. As the Business Services sector becomes increasingly digitally-enabled, broad digital competence becomes imperative for this workforce.

Utilities

The Utilities industry employs over 100,000 people, providing vital services in Fossil Fuel and Renewable Generation, supplying high-voltage electricity from generators to distribution networks and directly to domestic and industrial users, gaseous fuel storage and distribution, gas retail, transmission and distribution, and providing water and sewerage systems to households and businesses, and irrigation water in agriculture. The industry is comprised of four main industry sectors:

- ESI Generation
- ESI Transmission, Distribution and Rail
- Gas
- Water.

The increasing adoption of new technologies has reshaped the industry's operations, increasing the need for workers to possess digital skills. This is highlighted in the following quotes taken from the four skills forecasts:

> *Digital technologies can offer a potential $1.3 billion of benefit per year for the electrical power sector alone. This will require a digitally competent workforce with a range of skills, from basic ICT skills to specialist skills, to manipulate and interpret data in a meaningful manner and deploy technologies more effectively.* (ESI Generation IRC)

> *The workforce will need to be prepared to work with intelligent technical support equipment (e.g. smart technologies – inverters, meters and new technologies such as storage at various scales)…Recruitment of digitally enabled workforce specialists who also have knowledge of the ESI TDR industry is already being reported as difficult. This has potential to increase over time as the demand for these occupations inevitably continue to grow to meet demands.* (ESI Transmission, Distribution and Rail IRC)

> *The increasing adoption of new technologies in the Gas Supply industry has transformed operations, creating new opportunities and requiring new skills and training… To benefit from these opportunities, training and upskilling the workforce in digital literacy, digital map reading, cybersecurity, data analytics and other data-related technologies is deemed essential.* (Gas IRC)

> *New technological innovations have transformed the industry's operations, providing opportunities to save costs, improve services, and boost efficiency… In line with these technologies, big data will be a strong focus into the future and the industry will require skills in data analytics, digital literacy, and cybersecurity.* (Water IRC)

> *The industry is utilising more digital technology and transitioning away from an asset centric mindset to a customer-centric one. To fully achieve the objectives of a customer centric model, the workforce requires skills such as creativity, problem-solving, critical thinking, and digital skills.* (Water IRC)

✏️ Foundation Skills

Overview

Strong foundational skills, namely literacy and numeracy skills, but also digital and financial literacy, are extremely important for most jobs in the knowledge economy. Foundation skills underpin the productivity of Australia's workforce and are instrumental in ensuring workers have the ability to upskill.

Training for foundation skills is undertaken through the Foundation Skills Training Package which is developed by the Education Industry Reference Committee.

Recent feedback from industry and providers indicate that the Foundation Skills Training Package is currently failing to provide foundation skills to learners, and a review of the training package is required in an attempt to address this.

🌐 Industry skills needs

Generic skills

In their 2019 Skills Forecasts, IRC's ranked a series of 12 generic skill categories, in priority order.

1 Learning agility / Information literacy / Intellectual autonomy and self-management

2 Communication / Virtual collaboration / Social intelligence

3 Design mindset / Thinking critically / Systems thinking / Problem solving

4 Technology use and application skills

5 **Language, Literacy and Numeracy (LLN) skills**

6 Managerial / Leadership skills

7 Customer service / Marketing skills

8 Science, Technology, Engineering, Mathematics (STEM) skills

9 Data analysis skills

10 Financial skills

11 Environmental sustainability skills

12 Entrepreneurial skills

Language, Literacy and Numeracy (LLN) (which aligns directly with Foundation skills) received an average ranking of 5th (out of 12) across all skills forecasts.

RANKED 5TH 🏅5

Priority skills

Foundation skills were also identified to a low degree by industries that reported on priority skills in their 2019 Skills Forecasts.

Low

Priority level according to IRC Skills Forecasts

● Low ● Moderate ● Medium ● Moderately high ● High
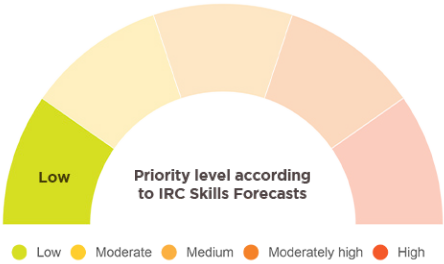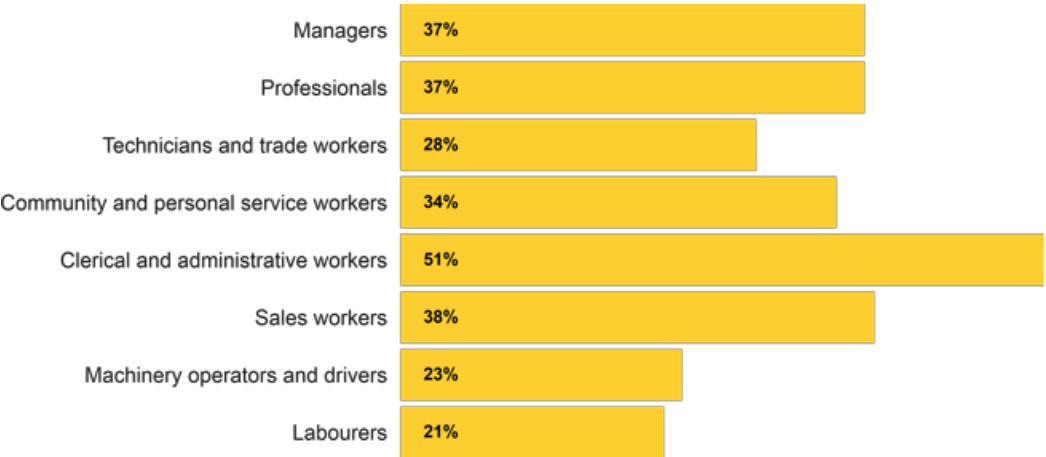
Two foundation skills were highlighted, including:

- **Language, literacy and numeracy**, identified by:
  - Process Manufacturing

- **Employability skills for work readiness**, identified by:
  - Furnishing

Internet job postings

Internet job vacancy postings that contained requests for foundation skills were examined for occupational trends. This includes writing, communication, typing and basic digital skills. The chart below compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested foundation skills.

Internet job postings that requested foundation skills, by occupation (2016-19)

Occupation	Percentage
Managers	37%
Professionals	37%
Technicians and trade workers	28%
Community and personal service workers	34%
Clerical and administrative workers	51%
Sales workers	38%
Machinery operators and drivers	23%
Labourers	21%

Source: Burning Glass Technologies' Labor Insight™ Real-time Labor Market Information tool.

Foundation skills were most often explicitly requested for clerical and administrative positions, and least often for machinery operation or labouring positions. Overall these skills are often requested, with postings across all occupational types requesting foundation skills more than 20% of the time. Often these skills will be implicit in a job (such as expecting good digital literacy skills for IT workers), which may explain why these rates are not higher.

Employers are requesting a range of basic communication and administrative skills when recruiting for entry-level postions. It is difficult to understand the full extent to which these skills are required as for many occupations these skills are implicitly required and won't be specifically asked for. For example, employers will not ask for basic communication or literacy skills when recruiting for managerial or highly technical postions.

Case Study

Manufacturing

The Manufacturing industry is broad and encompasses a variety of sectors and job roles. The Manufacturing IRC's 2019 Skills Forecast indicated that continually advancing technology within the industry is having a notable impact on skills needs, particularly within the area of digital literacy. In addition, inadequate literacy and numeracy skills continue to be an ongoing issue for the workforce.

The following are quotes from the Manufacturing IRC's 2019 Skills Forecast which highlight the importance of digital literacy skills to the industry, as well as a need to build on the foundation skills of literacy and numeracy within the manufacturing workforce:

Insufficient levels of literacy and numeracy: which was reported as a challenge by 99% of respondents. This was an increase from 92% in the previous year.

IRC members previously observed that although they would expect that learners would already possess the necessary underpinning Language, Literacy and Numeracy (LLN) and STEM skills when enrolling in qualifications, this is often not the case.

Work conducted by CSIRO on advanced manufacturing identified that sustained growth in the sector will require investment and translation of enabling science and technology, including: sensors and data analytics, advanced materials, smart robotics and automation, 3D printing, and augmented, mixed and virtual reality, which in turn has implications for underpinning digital literacy and Science, Technology, Engineering and Mathematics (STEM) skills across the workforce.

Leadership & management skills

Overview

Leadership and management skills encompass a range of skills associated with people management, self-management and change management.

Planning, problem-solving and decision-making are all skills which pertain to leadership and management. Other major aspects of managing and leading include supervision of others, the ability to delegate tasks, and to effectively manage yourself and your workload.

Industry skills needs

Generic skills

In their 2019 Skills Forecasts, IRC's ranked a series of 12 generic skill categories, in priority order.

1	Learning agility / Information literacy / Intellectual autonomy and self-management
2	Communication / Virtual collaboration / Social intelligence
3	Design mindset / Thinking critically / Systems thinking / Problem solving
4	Technology use and application skills
5	Language, Literacy and Numeracy (LLN) skills
6	Managerial / Leadership skills
7	Customer service / Marketing skills
8	Science, Technology, Engineering, Mathematics (STEM) skills
9	Data analysis skills
10	Financial skills
11	Environmental sustainability skills
12	Entrepreneurial skills

Managerial/Leadership skills (which aligns directly with Leadership and management) received an average ranking of 6th (out of 12) across all skills forecasts.

RANKED 6TH

Priority skills

Leadership and management skills were also identified to moderate degree by industries that reported on priority skills in their 2019 Skills Forecasts.

Moderate

Priority level according to IRC Skills Forecasts

● Low ● Moderate ● Medium ● Moderately high ● High
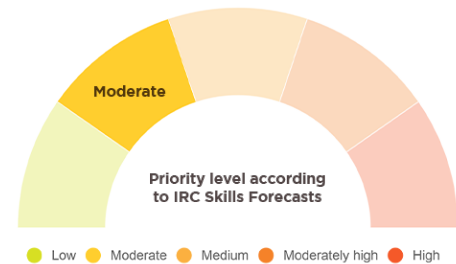
The main leadership and management-related skills, identified most frequently within priority skills lists in skills forecasts, were:
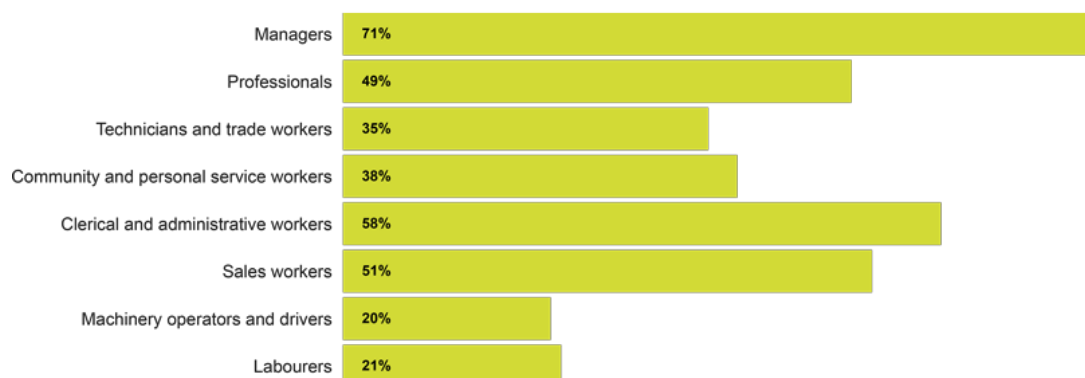
- **Management-related, and planning, scheduling, logistical and supply chain management skills**, identified by:
  - Forestry and Wood Products
  - Manufacturing and Engineering
  - Printing and Graphic Arts.

Internet job postings

Internet job vacancy postings that contained requests for leadership and management skills were examined for occupational trends. This includes skills in leadership, planning, time management, building relationships, mentoring and decision making. The chart below compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested leadership and management skills, incluing communication.

Internet job postings that requested leadership and management skills, by occupation (2016-19)

Occupation	Percentage
Managers	71%
Professionals	49%
Technicians and trade workers	35%
Community and personal service workers	38%
Clerical and administrative workers	58%
Sales workers	51%
Machinery operators and drivers	20%
Labourers	21%

Source: Burning Glass Technologies' Labor Insight™ Real-time Labor Market Information tool.

Unsurprisingly,leadership and management skills were most often explicitly requested for managerial and positions. However, 29% of managerial postions didn't have an explicit reference to leadership skills. This does not mean these skills were not relevent, but more likely indicates the empoyers is assuming only those with leadership skills would apply for the position. Leadership and management skills were least often requested for machinery operators and labourers, but all catagories of profession had these skills requested in 20% or more job postings.

The following graphic shows examples of occupations where leadership and management skills are highly requested, and some examples of the types of requests employers are making for those in these occupations.

Leadership and management skills requested by employers are usually related to communication or analytical skills. This ranges from communicating with internal and external teams and managing customers, to planning, analysing options and thinking strategically.

Case Studies

Manufacturing and Engineering

The Manufacturing and Engineering industry includes a variety of business types and occupations, usually associated with designing, making, assembling, installing, maintaining and repairing manufactured products, and incorporates the following sectors:

- Engineering
- Boatbuilding and Shipbuilding
- Jewellery Manufacture
- Locksmithing
- Watch and Clock Service and Repair.

As outlined in the Manufacturing and Engineering IRC's 2019 Skills Forecast, business models in the industry are changing, with some businesses developing whole products and integrated solutions as opposed to being component manufacturers, while others are becoming more specialised.

Changing business models also signifies a change in skills demand, particularly around the area of leadership and management. A survey of the Manufacturing and Engineering industry highlighted a significant and growing lack of leadership and management skills among workers, with 62% of respondents indicating that this was having a significant impact on business.

In addition, the Manufacturing and Engineering IRC's 2019 Skills Forecast reported predictions of employment growth for Production Managers and Management Analysists, with these occupations expected to grow by more than 5%.

The following quotes from the Manufacturing and Engineering IRC's 2019 Skills Forecast highlight the changing skills needs and gaps in the industry:

> *Need for underpinning generic skills, including mathematics, problem-solving (including advanced problem-solving and analytical problem-solving models), interpretation of supplied information, time-keeping, goal-setting, customer service skills, and project management skills.*

> *Projected employment growth of more than 5% for Production Managers, Management and Organisation Analysts, Other Miscellaneous Technicians and Trades Workers and Product Assemblers over the five years to 2023.*

> *Lack of leadership and management skills, with 62% of respondents believing that a lack of leadership and management skills is having a high impact on the business. This was an increase from 56% in the previous year.*

STEM Skills

Overview

Strong science, engineering, technology and mathematics (STEM) skills, are extremely important for the knowledge economy.

While often associated with the university sector, the report **Australia's STEM Workforce** released by the Office of the Chief Scientist on Australia's STEM workforce shows that the vocational education and training (VET) sector provides more than two thirds of Australia's STEM workforce.

However, different industries have different levels of STEM needs and more work needs to be done with the relevant training packages to specify realistic standards for STEM-related competency requirements.

Industry skills needs

Generic skills

In their 2019 Skills Forecasts, Industry Reference Committees (IRC's) ranked a series of 12 generic skill categories, in priority order.

1 Learning agility / Information literacy / Intellectual autonomy and self-management
2 Communication / Virtual collaboration / Social intelligence
3 Design mindset / Thinking critically / Systems thinking / Problem solving
4 Technology use and application skills
5 Language, Literacy and Numeracy (LLN) skills
6 Managerial / Leadership skills
7 Customer service / Marketing skills
8 Science, Technology, Engineering, Mathematics (STEM) skills
9 Data analysis skills
10 Financial skills
11 Environmental sustainability skills
12 Entrepreneurial skills

Science, technology, engineering and mathematics skills received an average ranking of 8th (out of 12) across all skills forecasts.

RANKED 8TH

Priority skills

STEM skills were also identified, but only to a low level, by industries that reported on specific priority skills in their 2019 Skills Forecasts.

Priority level according to IRC Skills Forecasts

Low ● Low ● Moderate ● Medium ● Moderately high ● High
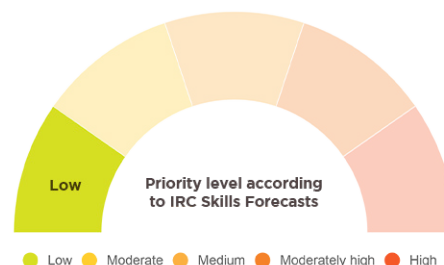
While not highly ranked across all indutries, STEM skills are a high priority for a handful of industries, including:

- **Manufacturing**, specifically within the following industry sectors:
  - Textiles, Clothing and Footwear
  - Furnishing.

Interestingly, the value of STEM skills may, in fact, be under-reported in Skills Forecasts – this is supported by a statement in the Textiles, Clothing and Footwear 2019 IRC's Skills Forecast, which notes that employers believe "*STEM and Language, Literacy and Numeracy (LLN) skills are vitally important in the TCF workforce, but employers have an expectation that new workers have developed these skills to a suitable entry level before they commence work*". Which explains why STEM skills were not ranked as highly by the Textiles, Clothing and Footwear industry, and perhaps by other industries also.

Internet job postings

Internet job vacancy postings that contained requests for STEM skills were examined for occupational trends. This includes chemistry, biology, botany, engineering, and experimental expertise. The chart below compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested STEM skills.

Internet job postings that requested STEM skills, by occupation (2016-19)
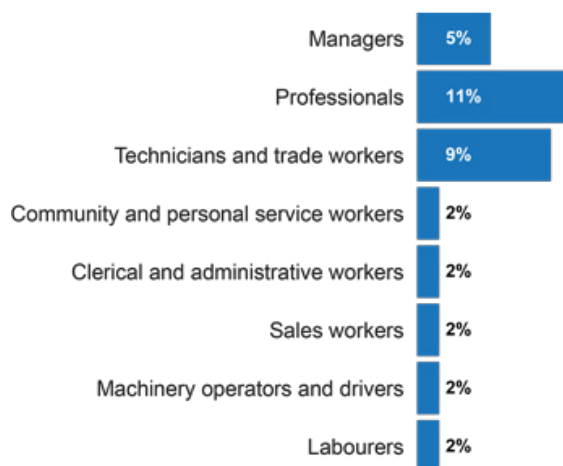
Source: Burning Glass Technologies' Labor Insight™ Real-time Labor Market Information tool.

STEM skills were most often requested for professional and technicians and trades workers, and were rarely requested for most other types of occupation. Because most STEM skills are relevent to specific technical or professional occupations, it is likely that emplyoers only request them when the occupation directly demands it,

The following graphic shows examples of occupations where STEM skills are highly requested, and some examples of the types of requests employers are making for those in these occupations.
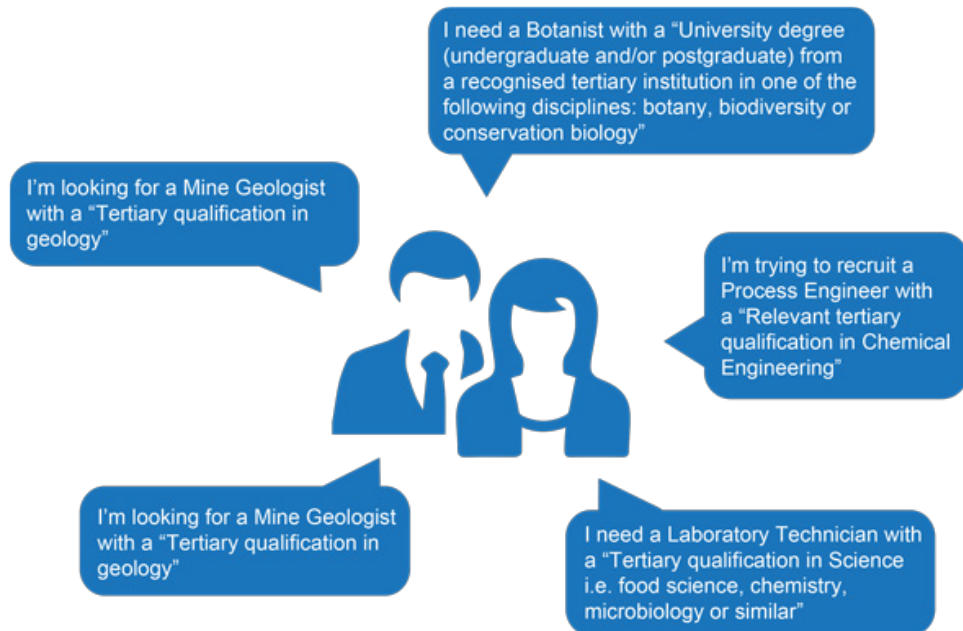
When employers request STEM skills, they often directly request tertiary qualifications in the relevant field. This suggests that employers rely on formal qualifications in order to gauge the STEM skills of potential employers.

Case Study

Textiles, Clothing and Footwear

The Textiles, Clothing and Footwear industry is grouped into three broad areas:

- Production of clothing, textiles, footwear, leather goods and technical textiles
- Provision of services including fashion and textile design, dry cleaning operations, laundry operations and clothing and footwear repairs
- Processing and manufacturing of natural (wool, cotton and leather) and synthetic materials such as polyvinyl chloride (PVC) and shade cloth.

This industry is evolving, partly due to new technologies and materials such as technical textiles and nonwoven fibres, which has led to further increases in the demand for a STEM-skilled workforce. The following areas are experiencing growth as a result of research and development:

- Carbon fibres and composites in clothing and footwear
- Functional fibrous materials used in medical textiles, super hydrophobic textiles and protective garments and gloves
- Nanofibers used in filtration, tissues engineering, energy generation and reinforcement sensors
- Biomedical applications of natural fibre structures.

According to the Textiles, Clothing and Footwear IRC's 2019 Skills Forecast:

> *Australian operators are using new technology to develop high performance fibres with improved durability, strength, moisture absorption and flame resistance. New manufacturing management software is also being used to optimise production processes allowing better inventory management, faster turnaround times and greater market responsiveness.*

Further, in their 2019 Skills Forecast the Textiles, Clothing and Footwear IRC identified the following skills Diploma graduates can bring to newly established businesses:

> *Diploma graduates are securing jobs with young designers who have established businesses after graduating with a university degree. The experience has been that university graduates have business skills but little practical skill in pattern making, product development and the development of Tech Packs77 for overseas production. Diploma graduates can bring these skills to the business.*

The forecast goes on to explain that:

> *With a predominantly female workforce in some sectors of the TCF industry, Vogue Australia has identified the need to increase the number of women with the STEM skills to support technological development in the industry.*

And,

> *A shift in Australia to more niche and bespoke products in the TCF industry relies on the availability of quality craftsmanship and strong technical skills. The Alvanon survey of the international apparel industry found that respondents emphasised the need for technical training rather than leadership or soft skills.97 In their resulting report, the authors stated that because technical skills are outsourced by many businesses, universities have stopped providing these skills in fashion qualifications. Additionally, the introduction of sophisticated digital technologies into the industry has made it hard for educators to keep pace with the technical skills that are applied in the industry.*

Sustainability and Natural Resource Management

Overview

Since committing to the Paris Agreement in 2015/2016, Australia has engaged in reducing carbon emissions and combatting climate change.

In an effort to deal with the effects of climate change and improve sustainability, there is an increasing need for sustainability and natural resource management skills.

The 2009 Green Skills Agreement revised training packages to include 'green skills', and the current cross-sector project on **Environmental Sustainability Skills** continues the empahsis on sustainability skills by aiming to identify duplication and gaps in sustainability skills which span industries.

Cross sector projects

Industry skills needs

Generic skills

In their 2019 Skills Forecasts, IRC's ranked a series of 12 generic skill categories, in priority order.

1 Learning agility / Information literacy / Intellectual autonomy and self-management

2 Communication / Virtual collaboration / Social intelligence

3 Design mindset / Thinking critically / Systems thinking / Problem solving

4 Technology use and application skills

5 Language, Literacy and Numeracy (LLN) skills

6 Managerial / Leadership skills

7 Customer service / Marketing skills

8 Science, Technology, Engineering, Mathematics (STEM) skills

9 Data analysis skills

10 Financial skills

11 Environmental sustainability skills

12 Entrepreneurial skills

Environmental sustainability skills (which aligns directly with Sustainability and Natural Resource Management) received an average ranking of 11th (out of 12) across all skills forecasts.

RANKED 11TH 11

Priority skills

Sustainability and Natural Resource Management-related skills were also identified, but only in a few instances, by industries that reported on specific priority skills in their 2019 Skills Forecasts.

Moderate

Priority level according to IRC Skills Forecasts

● Low ● Moderate ● Medium ● Moderately high ● High
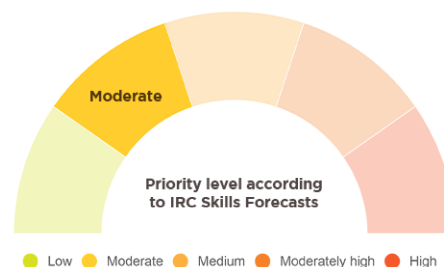
While not highly ranked across all industries, environmental sustainability is prioritised by the following handful of industries:

- **Food, Beverage and Pharmaceutical Product Manufacturing**, which prioritises best practice recycling and waste minimisation, sustainable manufacturing processes, and responsible consumption of energy and minimisation of energy waste

- **Mining, Drilling and Civil Infrastructure** and **Process Manufacturing**, particularly the Chemical, Hydrocarbons and Refining sector, which both prioritise environmental sustainability

- **Sustainability**, which prioritises sustainable operations, generic skills related to manufacturing and sustainability, competitive systems and practices (increased focus on advanced manufacturing and sustainable manufacturing processes), energy management, use and procurement (options for maximising energy efficiency, increased focus on renewables technology) and environmental monitoring and technology.
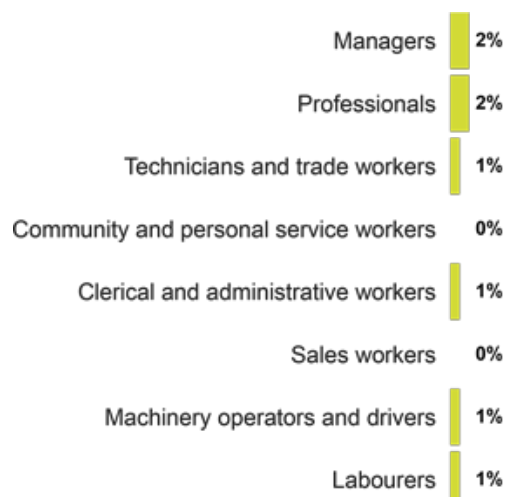
- **Textiles, Clothing and Footwear**, which prioritises ethical sourcing and supply chain management

Internet job postings

Internet job vacancy postings that contained requests for sustainability and natural resource management skills were examined for occupational trends. This includes land and resource management, environmental protection, water treatment, and environmental engineering. The chart below compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested sustainability and natural resource management skills.

Internet job postings that requested for sustainability and natural resource management skills, by occupation (2016-19)

Managers	2%
Professionals	2%
Technicians and trade workers	1%
Community and personal service workers	0%
Clerical and administrative workers	1%
Sales workers	0%
Machinery operators and drivers	1%
Labourers	1%

Source: Burning Glass Technologies' Labor Insight™ Real-time Labor Market Information tool.

Sustainability and natural resource management skills are rarely directly requested in job postings, but they are requested the most for managers and professional and almost never for sales workers or community and personal service workers. This suggests employers will only request these skills when the job is environmentally focused.

The following graphic shows examples of occupations where sustainability and natural resource management skills are highly requested, and some examples of the types of requests employers are making for those in these occupations.

Occupations with sustainability and natural resource management skills requested are normally directly within an environmental field, such as environmental advice or management. They are also relevant for policy and planning positions where environmental concerns are a factor.

Case study

Food, Beverage and Pharmaceutical Product Manufacturing

The Food, Beverage and Pharmaceutical Manufacturing industries provide direct employment to more than 215,000 people and food and beverage products are central to the employment and sustainability of the agriculture, meat, seafood, wine, wholesale and retail, and tourism and hospitality industries. This industry includes:

- Food processing and manufacturing
- Beverage manufacturing
- Pharmaceutical manufacturing
- Nutraceutical manufacturing
- Wholesaling and retailing.

The Food, Beverage and Pharmaceutical IRC's 2019 Skills Forecast has identified sustainability as a priority, particularly best practice recycling and waste minimisation, sustainable manufacturing processes, and responsible consumption of energy and minimisation of energy waste. Changes in skills requirements for the sector's workforce are being led by consumer and industry trends, and the regulatory environment, which is highlighted in the following quotes from the skills forecast:

> The food and beverage industry has experienced many key changes in the skills and tasks performed by the food processing workforce since 2011. These range from regulatory changes affecting food safety and manufacturing processes to trends in what consumers want to eat and drink. In particular, there is a need to consider…Sustainable work practices and efficient energy consumption.

> More advanced skills are required in more senior job roles, and can be driven by changing consumer trends, technological development and improvements in health and safety and regulation changes.

> The Australian food, beverage and pharmaceutical industry operates under a high level of regulation…Businesses signatory to the Australian Packaging Covenant, an agreement between government, industry and community groups, are obliged to find and fund solutions to address packaging sustainability issues.

> There are continuing and growing changes in consumer demand, and food and beverage trends that have influenced this Skills Forecast, including but not limited to: a desire for healthier, 'clean' and natural food, beverages and pharmaceutical products; interest in gluten-free, non-dairy and allergen-free foods, and personalised nutrition; the desire to know where food and beverages have come from and how it was transported and processed; the preference for ethical practices in food and beverage production; a desire to reduce the carbon footprint and environmental effects of food and beverage production and product transportation; a desire to reduce or manage waste, including food and beverage waste and packaging.

Priority skills

Methodology

The priority skills framework has largely been based on, and adapted from, the skills outlined in the skills chapter of the Miles Morgan report **Future skills and training: A practical resource to help identify future skills and training.** The report outlines a series of skills that workers will need to be effective in Australia's future workplace.

Additional skills areas have been included where IRC Skills Forecasts have consistently identified certain skills needs, which aren't a focus in the Future skills and training report.

In total, eleven priority skills areas have been identified:

- Adaptability and learning skills (i.e. innovation, flexibility, and multiskilling)
- Analytical skills (data analysis, critical and creative thinking, and problem solving)
- Business and compliance skills (small business skills, and regulatory compliance)
- Collaboration skills (interpersonal skills, communication, and teamwork)
- Customer service and marketing skills (social media, marketing and customer service)
- Digital skills (new technologies, robotics and automation, big data, and cybersecurity)
- Foundation skills (language, literacy and numeracy, including digital literacy)
- Industry and occupation specific skills (technical skills)
- Leadership and management skills (leadership of self and others)
- STEM skills (Science, technology, engineering and mathematics)
- Sustainability and natural resource management skills (green skills).

Allocation of skills

Each priority skill area aligns closely with one of the generic skills ranked by IRCs in their Skills Forecasts, and reflects a range of relevant 'free-text' examples of more specific skills, requested by IRCs throughout their forecasts. For example, the generic skill 'Communication / virtual collaboration / social intelligence'; and IRC demand for 'active listening', 'communication skills', 'collaboration skills' and 'social perceptiveness' in the Skills Forecasts are captured within the 'Collaboration skills' area. Best judgement was used to allocate 'free-text' responses to the most appropriate skill area from the list above.

The priority skill area 'Industry and occupation specific skills' has been created to capture all the specific and technical skills IRCs have identified which are relevant to their industry or occupation.

Skills ranking

A systematic review of the skills forecasts from 2019 has been undertaken to identify which priority skills areas are ranked most highly by IRCs.

Generic skills have been consistently ranked by all IRCs in the Skills Forecasts. These have been used to determine the average ranking of priority skill areas across all Skills Forecasts.

In addition, other skills identified as a workforce priority in the Skills Forecasts have been counted and converted into a low/medium/high 'gauge level'. Gauge level classifications are based on the proportion of all skills forecasts which identify and prioritise skills within a specific skill area. For example, a skills forecast may refer multiple times to different 'digital skills' in their skills outlook (for example coding skills, digital literacy and automation), but this is only counted once, against the 'Digital skills' area. The priority skills area appearing in the most IRC skills forecasts was allocated the highest level on the gauge scale, while the skills area prioritised the least in IRC skills forecasts ranked the lowest.

The case studies that are presented in each Priority skills page are intended to provide more information about IRC or industry demand for a specific skill (and more detail about why that skill is a priority for that particular industry).

Key initiatives

Overview

This section links to information on training package development activities and initiatives of the Australian Industry and Skills Committee and its network of Industry Reference Committees (IRCs).

This includes **cross-sector projects** currently underway and other training package review and development initiatives. The cross-sector projects aim to address common skills needs shared across industries. Cross sector projects also minimise duplication of units, consolidate existing units and remove units that are no longer being used.

Cross-sector projects

Digital transformation projects

These projects, which are focussed on automation, digital skills, big data and cybersecurity, examine the skills profiles of existing roles, and the digital competency-related requirements of emerging roles in Australia's developing digital economy.

- **Automation and Digital Skills**

The AISC has established a Digital Transformation Industry Reference Committee (IRC) to advise on workforce and vocational skills needs, and opportunities arising from Industry 4.0 and evolving technologies such as robotics, drones and remote operation systems. The new IRC works with industry to define competencies in areas such as big data, supply chains, automation, digital skills and cyber security.

For more information, visit the **Australian Industry Standards** website.

- **Big data**

The Big Data Cross Sector Project has reviewed current and emerging developments in big data skills, particularly in relation to data management, data analytics and data-driven decision-making, and has identified related skills needs, which are shared by multiple industry sectors. The Case for Endorsement associated with this project has been finalised and submitted to the AISC for approval.

For more information and an update on progress, visit the PwC's **Skills for Australia** website.

- **Cybersecurity**

This project sought to reduce duplication across the national VET system by reviewing current and emerging developments in cybersecurity skills, particularly in relation to data confidentiality, protection and privacy, and identify related skills needs shared by multiple industry sectors. A Case for Endorsement associated with this project has been finalised and submitted to the AISC for approval.

For more information and an update on progress, visit the PwC's **Skills for Australia** website.

Supply chains

This project examined the implications of major changes to skills requirements, occurring both across and within supply chains. In particular, this project focused on changes driven by automation, robotics, big data and other new technologies. These disruptive technologies have compelled supply chain related industries to innovate and find new efficiencies, to meet consumer demand and remain competitive. This project sought to develop skills sets and units of competency that enable this innovation, and which are applicable to a range of industry sectors. A Case for Endorsement associated with this project has been finalised and submitted to the AISC for consideration.

For more information and an update on progress, visit the **Australian Industry Standards** website.

Environmental sustainability

This project focuses on current and emerging developments in environmental sustainability skills, the skills required to support transition to a sustainable economy. Its aim being, to identify skills needs shared by multiple industry sectors, related to environmentally sustainable products, manufacturing and waste processes, sustainable energy production, and the natural environment.

Following consultations with the IRCs about environmental sustainability, particularly related to the skill standards and qualifications for which they are responsible, the Environmental Sustainability Expert Panel have identified significant challenges inherent with this project. Based on these findings, a report has been submitted for the AISC for consideration.

For more information and an update on progress, including the case for change visit the **Skills Impact** website.

Teamwork and communication

This project reviewed current and emerging developments in teamwork and communication skills, and other related skills needs shared by multiple industries. The AISC approved five new units of competency at their 4 December 2018 meeting. These are housed in the Business Services Training Package.

For more information, visit the **Skills for Australia** website.

Inclusion of people with disability

This project investigated how Australia's VET system could equip educators, employers and customer service providers with the skills and knowledge required to better include people with disability in education, employment and service contexts. In line with the Case for Endorsement, the AISC approved the development of four new disability cross sector units, housed in the Business Services Training Package.

For more information and to view the Case for Endorsement, visit the **Skills for Australia** website.

Consumer engagement via online and social media

Consultation to identify the common skills needs of industries in relation to consumer engagement through online and social media has occurred. The intent being, to modernise Training Package Products related to online and social media engagement skills.

For more information and to access the Final Case for Change, visit the **SkillsIQ** website.

Other training package development projects

The National Schedule details the training package review and development work currently underway and commissioned by the Australian Industry and Skills Committee (AISC) following advice from its network of Industry Reference Committees (IRCs).

For more information on AISC initiatives and any recent announcements please visit the **AISC** website.