

# Qualifications and the future labour market in Australia

Report prepared for the National Training Reform Taskforce

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## Executive summary

This report has been prepared for the National Training Reform Taskforce to report on the future supply of, and requirements for, vocational education and training (VET) qualifications in Australia. It is intended to inform the next stages of reform of the sector to be considered by the Council of Australian Governments (COAG).

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### Overview

A person's educational qualifications provide essential labour market information to employers in filling vacancies and help individuals in the development of career paths. They also provide a measure of the output of Australia's training system.

A considerable amount of training occurs without recognised qualifications being issued (eg. some types of training provided in the workplace and module completions) but these forms of acquiring skills are not the focus of this report.

This report provides:

1. a projection of the qualifications profile of people in employment in Australia in 2016;
2. estimates of the additional number of qualified people required in the next ten years to attain the 2016 qualifications profile of employed people;
3. estimates of the supply of people with VET qualifications from 2006 to 2016;
4. estimates of the gap between supply and requirements in the number of people with VET qualifications from 2006 to 2016; and
5. estimates of the additional student contact hours required to meet the shortfall in the number of people with VET qualifications from 2006 to 2016.

The qualifications profile of the employed workforce was derived from estimates of growth in employment and *skills deepening* within occupations. Skills deepening in an occupation is measured as the increase in the proportion of people with qualifications over and above that due to employment growth. The ABS *Education and work survey* data from 2001 to 2005 indicate considerable skills deepening in Australia. Assuming these trends continue, the proportion of employed people with qualifications in 2016 is estimated to be 71.2 per cent compared with 58 per cent in 2005, with increasing numbers achieving qualifications at higher levels.

To increase qualifications held by Australians in work to targeted levels, more training will be required for substantial numbers of new entrants and for existing workers. The number of additional people who will need to acquire qualifications from 2006 to 2016 is estimated to be 4.03 million, 2.25 million new entrants and 1.78 million existing workers. Of these, 61.4 per cent will need a VET qualification and 38.6 per cent a higher education qualification. Among VET qualifications needed, 49.3 per cent will need to be at certificate III/IV, 35.7 per cent at diploma/advanced diploma and 15 per cent at certificate I/II.

If supply of people with VET qualifications remains at the same level as in 2005, a shortfall of 240,000 can be expected over the ten years to 2016.

To meet the shortfall, *net* completions will need to increase by 1.9 per cent per year. Net completions are the total number of qualifications awarded in a year, less those at the same or lower level than those already held (as these do not contribute to lifting the qualifications profile). Based on current patterns of course enrolments and completions, significant increases in net completions will be required at the diploma and advanced diploma levels. A moderate increase will also be required at certificate III.

A shift in distribution to higher level qualifications means a considerable increase in the average time taken to complete a course. Training hours delivered will therefore need to increase five per cent per year to ensure not only the required number of qualified people become available, but also that their qualifications are at appropriate levels.

Estimates of future requirements for qualifications in this report are based on Australia having 11.23 million people employed in 2016. However, if employment was to increase to a higher level (eg. through higher participation in the labour force) then training requirements will be higher than estimated in this report.

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### **Qualifications, employment and skills deepening in Australia, 2001–05**

The composition of the workforce in terms of qualifications<sup>1</sup>, gender, age, occupation and hours of work has been changing. The trends inherent in these changes provide useful information about future qualification requirements in different segments of the labour market and the characteristics of people who are likely to need them.

*From 2001 to 2005, the Australian **labour force** (the employed plus the unemployed) aged 15–64 years changed in the following ways:*

- The labour force participation rate increased two percentage points to 77.1 per cent.
- The size of the labour force increased 6.8 per cent to 10.24 million, but the number of workers with qualifications increased 14.2 per cent to 5.83 million.
- Not only did the total number of females in the labour force increase at a faster rate (2.1 per cent per year) than males (1.2 per cent per year), but the number with qualifications also increased at a faster rate. Despite this, females comprised 45.2 per cent of the labour force and 44.1 per cent of those with qualifications in 2005. In the same year, a higher percentage of females held higher education qualifications (24.4 per cent) than males (20.7 per cent). Whereas the VET qualifications of males were mostly at a certificate III or IV level, those of females were more evenly spread across all levels.
- The number of workers aged 45–64 years in the labour force increased 4.1 per cent per year. This rate is much higher than for other age groups. The number of older workers with qualifications also increased at a relatively fast rate. People with higher education qualifications increased substantially among all age groups. Substantial increase in VET qualifications was recorded only among those aged 45–64 years. Within VET, the biggest increase across all age groups was at the diploma level.

*The changes in **employment** of people aged 15–64 years from 2001 to 2005 were:*

- Employment increased 8.7 per cent to 9.71 million, but the number with qualifications increased 15.4 per cent to 5.63 million.
- Employment of people with higher education qualifications increased at a faster rate (4.8 per cent per year) than of people with VET qualifications (2.9 per cent per year). By 2005, 58 per cent held qualifications (34.6 per cent VET and 22.4 per cent higher education). Of those with VET qualifications, 25 per cent had a diploma/advanced diploma, 54.4 per cent a certificate III/IV and 20.6 per cent a certificate I/II.
- Part-time employment increased at more than twice the annual rate for full-time employment (3.6 per cent compared to 1.6 per cent). While the increase in full-time employment was

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<sup>1</sup> Refers to the highest post-school qualification attained.

restricted to qualified workers, part-time employment also increased for workers without qualifications.

- Employment growth varied across occupations ranging from negative 2.4 per cent per year in the advanced clerical and service group to 4.6 per cent in the associate professionals group. The employment of people with diplomas grew strongly in all groups.
- In 2005, about 90 per cent of people in the professionals group held qualifications compared to around 66 per cent in managers and administrators, associate professionals and trades, around 50 per cent in advanced and intermediate clerical, sales and service, and around 33 per cent in all other groups. Although most professionals had higher education qualifications, 20.3 per cent had a VET qualification with more than half of these at a diploma or an advanced diploma level. Many managers and administrators also had VET qualifications, most of which were certificates III.

The major reason for the increasing proportion of workers with qualifications is skills deepening. Skills deepening can occur because of a structural shift in industries, a shift in the occupational structure within industries, a shift to part-time work requiring more workers to be trained for a given amount of work and an overall rise in the level of skill and qualification requirements within occupations. Employment growth also leads to an increased demand for skills, but the size of this effect is usually much smaller than skills deepening. For example, the number of people employed in Australia increased by 19.7 per cent from 1995 to 2005, however the number with qualifications increased by 44.7 per cent.

The skills deepening rate is the difference between the percentage change in the number of people with qualifications and the percentage change in employment. For instance, if in a given occupation employment increased by 10 per cent and the number of people with qualifications increased by 15 per cent, then the skills deepening rate is five points. Within each occupation, the rate is calculated at each qualification level.

*From 2001 to 2005 skills deepening among employed Australians averaged 1.5 points per year.*

The overall rate was 2.7 points at the higher education level and 0.8 points at the VET level. Within VET, it varied from 8.9 points at the diploma level to negative five points at certificate I.

*The rate of skills deepening varies across occupations.* The overall rate was relatively high in elementary clerical, sales and service and labourers groups and relatively low in professionals. There was little evidence of overall skills deepening in the trades, although at specific qualification levels (diploma and advanced diploma) the rate was significant.

## **Qualifications profile of the employed workforce in 2016**

*From 2006 to 2016, the occupational and qualification composition of employment in Australia is forecast to change in the following ways:*

- *Employment in Australia will grow more slowly in the coming decade.* It is forecast to increase by 1.1 per cent per year, increasing from 10.04 million in 2006 to 11.23 million in 2016. This is significantly lower than the 2.1 per cent annual rate for the previous decade.
- *Employment will grow more quickly in higher skilled occupations than in lower skilled occupations.* High employment growth is forecast in high-skill occupations (managers and administrators, professionals and associate professionals). In advanced clerical and service and trades, a decline is forecast, although in the trades the decline is marginal. In all other occupations, the forecast is for relatively moderate growth. Consequently, the occupational profile is expected to shift towards high-skill occupations. By 2016, more Australians will be employed as associate professionals than tradespersons.

- *The proportion of the employed workforce with a post-school qualification will increase.* Assuming that trends of skills deepening within occupations continue over the next decade, over 71.2 per cent of Australia's employed workforce in 2016 will have some post-school qualification (41.6 per cent VET and 29.6 per cent higher education). While the employment of workers with qualifications will increase by more than two million, of those without qualifications it will decline by 840,000.
- *In most occupations more than half the workers will have qualifications.* Only in intermediate production and transport and labourers groups will the proportion of workers with qualifications be less than 50 per cent in 2016. In the three high-skill groups (managers and administrators, professionals and associate professionals) the proportion with qualifications will be over 80 per cent.
- *More workers will have higher level qualifications.* While the numbers with higher education qualifications will increase by about a half, the numbers with a diploma will more than double to 860,000. In contrast, the numbers with a certificate I will decline by 30.2 per cent to 206,000.

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### **Required numbers with qualifications in the ten years to 2016**

Additional people will need to be trained over the next ten years to raise the proportion of Australians in employment with qualifications to 71.2 per cent.

*In the ten years to 2016:*

- *Over four million Australians will need to acquire qualifications.* Of these, about 2.25 million will be new entrants to an occupation and about 1.78 million will be existing workers.
- *Most qualifications people acquire will need to be at the VET level.* About 61.4 per cent of qualifications will need to be at the VET level and 39.6 per cent at the higher education level. This translates to 2.47 million net completions of VET qualifications and 1.56 million net completions of higher education qualifications.
- *Just over half the qualifications of new entrants will need to be at the VET level.* About 54.1 per cent of qualifications of new entrants will need to be at the VET level (18.6 per cent diploma/advanced diploma, 26.3 per cent certificate III/IV and 9.2 per cent certificate I/II) and 45.9 per cent at the higher education level.
- *More than half of all new entrants with qualifications will be to high-skill occupations.* About 55.1 per cent of all new entrants with qualifications will be to the three high-skill occupation groups (managers and administrators, professionals and associate professionals) with another 28.6 per cent to intermediate and elementary clerical, sales and service and the remaining 16.3 per cent to the other four groups (only 5.6 per cent will be to the trades).
- *Most qualifications that existing workers acquire will need be at the VET level.* In all, 70.5 per cent of qualifications that existing workers acquire will need to be at a VET level (26 per cent diploma/advanced diploma, 35.3 per cent certificate III/IV and 9.2 per cent certificate I/II) and 29.5 per cent at a higher education level.
- *Most existing workers who acquire qualifications will be in intermediate or low-skill occupations.* Only 40.7 per cent of existing workers acquiring qualifications will be in the three high-skill groups (managers and administrators, professionals and associate professionals). The proportion in the trades will be 10.5 per cent.

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### **Supply of persons with VET qualifications in the ten years to 2016**

Estimates of the number of people with VET qualifications are largely based on data from the *National VET Provider Collection*.

A person who completes a course at the same or lower level than of their previous highest qualification does not affect the qualifications profile of the workforce. Therefore, such a person is not included in the estimate of the potential supply of persons with qualifications. Course completions that do affect the qualifications profile are referred to as net completions.

*Net completions of VET qualifications by Australian students are estimated to be about 2.23 million over the ten years to 2016.* The calculations assume completions remain at 2005 levels. Of all net completions, 15.1 per cent will be at a diploma/advanced diploma, 51.2 per cent at a certificate III/IV and 33.7 per cent at a certificate I/II level.

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### **The shortfall in VET qualifications in the ten years to 2016**

*At current levels of supply, there will be a shortfall of 240,000 people with VET qualifications over the ten years to 2016.* The number of net completions will need to increase 1.9 per cent each year over the next decade to overcome the shortfall.

*Shortfalls are expected at advanced diploma, diploma and certificate III.* Surpluses are expected at certificate I, II and IV. Thus to meet requirements both the *quantity* and *distribution* of supply of VET qualifications will need to change.

*The hours of training required will grow faster than the number of people acquiring VET qualifications.* This is because the number of student contact hours required is greater for higher level qualifications. A shortfall of 931 million student contact hours is estimated in the ten years to 2016. Therefore the number of training hours will need to increase five per cent per year over the next decade to meet the requirements.

If policy is to attain the 2016 target for the qualifications profile, the VET system will need to expand over the coming decade. Some expansion can be mitigated by improving course completion rates. People with partially completed qualifications could also be enticed to finish their training with appropriate incentives, including recognition of prior learning. These people will require fewer contact hours than those enrolling in the same course for the first time.

If employment increases more than projected in this report, as a result of improvement in the labour force participation rate, then training requirements will exceed the estimates provided here.



# 1 Introduction

This report assesses the supply of, and requirements for, workers with qualifications in the Australian labour market from 2006 to 2016. It aims to identify any imbalances in the number of people with vocational education and training (VET) qualifications by level. Information in this report can be used to develop training policies and identify targets for further public and private investment in human capital development.

While not all skills are formally recognised, or need to be, a worker's qualification represents an important signal to the labour market of their human capital potential. They provide essential labour market information to employers in filling vacancies and help individuals develop career paths and seek employment where their productivity and earnings can be increased. Qualifications provide a measure of the output of the training system.

A considerable amount of training occurs outside the formal education and training system, and some people undertake formal training to complete particular units/modules rather than whole qualifications. Hence, the analysis of qualifications contained in this report does not provide the whole picture of training and skills development.

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## 1.1 Background

### 1.1.1 Demand factors

There are several reasons why skill levels and associated qualification levels of Australia's workers will continue to increase and why government policies will support and encourage this trend.

Exposure to international competition and new technologies are affecting employment across a wide range of industries. The effects vary according to the extent to which a particular industry is vulnerable to, positively exposed to, or insulated from global competition.<sup>2</sup> Australian jobs in low-skill manufacturing industries were initially most vulnerable, but service and high-skill production jobs are increasingly becoming exposed to competition.

The result has been a substantial and continuing shift in the industrial and occupational composition of Australia's employed workforce. While there has been a trend towards employment in industries requiring higher skill levels, job opportunities have also increased in some low-skill jobs in insulated industries such as retail. In the last five years, the number of Australians in employment has grown by over one million people to over 10 million in 2006. Of the new jobs created, 80 per cent were in construction, retail, health and community services, property and business services and education (with the last three industries having the most qualified workers). Employment has notably declined in agriculture and manufacturing.

At the occupation level, professionals and associate professionals have enjoyed the most rapid expansion in employment. Combined, they represented 30 per cent of Australia's employment in 2006. In contrast, the number of people employed in trades, intermediate production and transport and labourers has declined in relative terms in recent years.

This change in Australia's occupational mix will increase the demand for training. Growth in employment and replacement needs will also add to demand. While the general effect of technological change is known to increase demand for employees with higher skills, its net effect on demand for all skill types can be mixed if new technologies lead to deskilling in some occupations. Future demand for training will also be affected by action to raise the share of people with qualifications and to change its distribution within occupations. Removing skills gaps, where

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<sup>2</sup> See Maglen and Shah (1999), Maglen (2001) and Shah and Burke (2003a).

workers are under-skilled for the occupation in which they are employed, or reducing skills shortages, where skilled jobs remain unfilled due to lack of trained persons, can also add to demand.

The considerable numbers of people who do not hold what are considered relevant qualifications (even in high-skill occupations) indicates possible skills gaps, although many of these unqualified workers have acquired skills in other ways. The desirable level of qualified people in an occupation is not static. If more qualified workers become available, changes in work specifications and new technologies that make use of their higher skills will improve productivity.

Skill shortages in Australia have been reported in a range of professionals, associate professionals and trades occupations (DEWR 2006). Several occupations, including those in the trades, have recently experienced skill shortages due to the buoyant construction and resource industries, with the most notable impact being felt in Western Australia and Queensland and the Northern Territory. These shortages have persisted in several trades despite the total number of people employed remaining relatively static.

In addition, the effect of labour turnover on skill requirements in Australia's workforce must be taken into account. Each year, workers leave occupations for various reasons, including moving to other occupations and retiring from the workforce. The number of workers retiring will rise in the coming years due to the ageing of Australia's baby boomers.

The trend towards part-time employment also creates additional training needs simply because it means that a larger number of people need to be trained for a given level of equivalent full-time jobs. The ageing of the workforce is also likely to increase this trend towards more part-time work.

### 1.1.2 Returns to training

The net returns of a more qualified Australian population are generally positive. People with qualifications have higher rates of employment at any age and their working life tends to extend longer than those without qualifications. Their annual income also tends to be considerably higher. With regard to VET qualifications, while higher rates of employment are associated with people who hold them, higher incomes are not always evident (Burke et al. 2003; Ryan 2002). This may partly be due to the difficulty of the analysis. Any estimates of returns to VET qualifications need to compare individuals who undertake a course with similar people who do not. Suitable data are rarely available to make these comparisons.

Higher earnings usually reflect higher productivity. Analyses of education and economic growth at a high level of aggregation are produced regularly by the OECD. A 2005 OECD study included the following findings:

- the effect of an additional year of education on long-term economic output in the OECD is estimated to be between three and six per cent;
- analyses of human capital across 14 OECD economies based on literacy scores also suggest significant positive effects on growth within countries; and
- many analyses indicate a positive causal relationship between attainment of higher educational qualifications and better mental and physical health, with the causality operating indirectly through income and employment, behavioural and psycho-social effects (OECD 2005).

### 1.1.3 Skills deepening

The major reason for increasing demand for workers with qualifications considered in this report is skills deepening, which refers to the percentage increase in the number of workers in an occupation with qualifications after allowing for employment growth.

Skills deepening can occur because of a structural shift in industries, a shift in the occupational structure within industries, a shift to part-time work requiring more workers to be trained for a

given amount of work, and an overall rise in the level of skill and qualification requirements within occupations.<sup>3</sup>

Employment growth also leads to an increase in demand for skills. However, as discussed below, the size of this effect is much smaller than that due to skills deepening. For example, the ABS *Education and work survey* data show employment in Australia increased 19.7 per cent from 1995 to 2005 but the number of employed people with qualifications increased 44.7 per cent.

The primary aim of this report is to quantify the numbers of people with different qualifications needed to meet future requirements. It is not to identify separate elements of skills deepening.

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## 1.2 Scope of this report

This report assesses the supply of, and requirements for, workers with qualifications in the Australian labour market from 2006 to 2016 with the aim to identify any imbalances in the number of people with VET qualifications.

Chapter 2 provides current qualification profiles of Australian workers by occupation and other demographic variables.

Chapter 3 includes forecasts of employment by occupation and qualification to 2016. It also includes an assessment of the additional numbers of qualified workers required in the next decade to attain the target for the qualifications profile of employed Australians in 2016.

Chapter 4 describes the current patterns of course enrolments and completions in the VET sector in Australia.

Chapter 5 assesses the gap in the supply and requirements for people with VET qualifications over the next decade. Estimates are provided of the rate of increase in net course completions and student contact hours that will be required to meet the shortfall.

Chapter 6 contains some concluding comments.

This report also includes an appendix with a more detailed analysis of the supply of, and requirements for, people with qualifications in the traditional trades.

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<sup>3</sup> DEET (1995) summarised the different effects behind the increased demand for people with qualifications. These effects are: (1) an output or aggregate employment effect, which arises from a general increase in the size of the workforce and operates similarly across workers with qualifications and those without qualifications; (2) a net industry structure effect, which arises as a result of the changing industry structure and productivity; (3) an occupational share effect, which results from the occupational mix within an industry; (4) an hours effect, which arises from a shift to part-time work (if part-time work becomes more prevalent for people with a given qualification then more people with that qualification will be required to produce the same quantity of a product or level of service); and (5) a qualifications share effect, a residual effect after the above structural effects are removed from the total increase in the proportion of people with qualifications.

## 2 Qualifications in Australia, 2001–05

This chapter describes trends in the numbers of Australians workers aged 15–64 years with post-school qualifications from 2001 to 2005.

Qualifications in this report refer to the highest non-school qualification level defined under the *Australian Standard Classification of Education* (ASCED). The level of highest educational attainment is an alternative measure of qualifications, but it tends to underestimate the number of people with certificates I and II because in the ASCED hierarchy a completed Year 12 is considered to be a higher qualification level than certificate I, and occasionally also certificate II. The focus here is on all post-school qualifications, particularly at the VET level.

The ABS *Education and work surveys* (Cat. no. 6227.0) for 2001 to 2005 provide the data for the analysis contained here.<sup>4</sup> These surveys are conducted in May each year. The changes in the number of people with qualifications by gender, age, field of education, full-time/part-time status and occupation are summarised below.

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### 2.1 Overall changes

This section describes the qualifications of Australia's labour force, particularly of those in employment. A brief description of the qualifications of the civilian population is provided below<sup>5</sup>. Table 1 shows just over half the population aged 15–64 years had qualifications in 2005. Of these, 61.9 per cent had a VET qualification and 38.1 per cent had a higher education qualification. The proportion with qualifications varies significantly with labour force status. A much higher proportion of those employed had qualifications compared to those who were unemployed or those not in the labour force. Furthermore, among the employed, part-time workers were less likely to have qualifications.

The employed, particularly those in full-time work, were at least twice as likely to have higher education qualifications as those not in work.

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<sup>4</sup> For the purposes of this report, records containing qualification codes that are not fully defined (nfd) have been proportionately re-assigned to certificates I, II, III and IV. This assumes that higher qualification holders are unlikely to provide a response that only partially identifies their qualification. The proportions were based on the frequency distribution of weighted counts of similar records matched by sex, age, labour force status, occupation, qualification field, and full-time/part-time status. Not fully defined occupation codes were similarly re-assigned.

<sup>5</sup> Note that the *Education and work survey* has a slightly different scope to the *Labour force survey*, and therefore, some statistics reported here may vary from those reported elsewhere.

**Table 1** Qualifications by labour force status, civilian population, Australia, May 2005 (%)

Highest non-school qualification	Employed			Unemployed	Not in labour force	Total
	Full-time	Part-time	All			
VET	37.3	29.2	35.0	27.4	22.9	31.9
<i>Adv diploma</i>	4.7	5.3	4.9	1.9	3.8	4.5
<i>Diploma</i>	4.1	3.3	3.9	3.5	2.0	3.4
<i>Certificate IV</i>	3.3	3.5	3.4	3.3	1.8	3.0
<i>Certificate III</i>	18.5	8.5	15.6	10.5	7.3	13.5
<i>Certificate II</i>	3.9	4.9	4.2	5.5	5.7	4.6
<i>Certificate I</i>	2.7	3.8	3.0	2.8	2.4	2.9
Higher education	25.2	17.5	23.0	11.2	10.3	19.6
With qualifications	62.5	46.8	58.0	38.7	33.2	51.5
Without qualifications	37.5	53.2	42.0	61.3	66.8	48.5
All	100.0	100.0	100.0	100.0	100.0	100.0
With qualifications ('000)	4,323	1,303	5,626	208	1,013	6,847
Without qualifications ('000)	2,598	1,483	4,081	330	2,038	6,449
All ('000)	6,921	2,786	9,707	539	3,051	13,296

Source: Unpublished ABS *Education and work surveys*, 2001–05 (ABS Cat. no. 6227.0). Scope: persons aged 15–64 years.

nfd = not further defined

Certificate III/IV nfd have been distributed proportionately across certificate III and certificate IV; certificate I/II nfd across certificate I and certificate II; and certificate nfd and level not determined across certificate I, II, III and IV.

Table 2 shows the qualifications of people aged 15–64 years in Australia's labour force from 2001 to 2005. The size of the labour force increased 6.8 per cent to a total of 10.24 million over this period.<sup>6</sup> The highest year-on-year change was an increase of 296,000 people from 2004 to 2005.

However, the number of people with qualifications increased at a faster rate than the labour force, with the result that 5.83 million in the labour force had qualifications in 2005, an increase of 14.2 per cent from 2001 to 2005.

In 2005, 34.6 per cent of Australia's labour force had VET qualifications and 22.4 per cent had higher education qualifications. Of those with VET qualifications, 54.3 per cent had a certificate III/IV, 24.8 per cent had a diploma/advanced diploma and 20.8 per cent had a certificate I/II.

The qualifications profile of Australia's labour force generally changed slowly from one year to the next from 2001 to 2005. Nevertheless, the proportion of workers with qualifications increased from 53.3 per cent to 56.9 per cent, with the distribution shifting towards higher level qualifications (certificate III or higher).

<sup>6</sup> The labour force participation rate for this age group increased two percentage points to 77.1 per cent from 2001 to 2005.

**Table 2 Qualifications, persons in the labour force, Australia, 2001–05**

Highest non-school qualification	'000					%				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
VET	3,206	3,266	3,387	3,499	3,544	33.4	33.7	34.2	35.2	34.6
<i>Adv diploma</i>	444	482	455	480	483	4.6	5.0	4.6	4.8	4.7
<i>Diploma</i>	261	301	342	370	395	2.7	3.1	3.5	3.7	3.9
<i>Certificate IV</i>	280	280	294	332	347	2.9	2.9	3.0	3.3	3.4
<i>Certificate III</i>	1,434	1,491	1,598	1,590	1,574	14.9	15.4	16.1	16.0	15.4
<i>Certificate II</i>	423	413	408	426	434	4.4	4.3	4.1	4.3	4.2
<i>Certificate I</i>	365	299	289	302	311	3.8	3.1	2.9	3.0	3.0
Higher education	1,902	2,019	2,054	2,167	2,290	19.8	20.8	20.8	21.8	22.4
With qualifications	5,109	5,284	5,440	5,666	5,834	53.3	54.5	55.0	57.0	56.9
Without qualifications	4,485	4,404	4,456	4,283	4,411	46.7	45.5	45.0	43.0	43.1
All	9,593	9,688	9,896	9,949	10,245	100.0	100.0	100.0	100.0	100.0

Source: Unpublished ABS *Education and work surveys*, 2001–05 (ABS Cat. no. 6227.0). Scope: persons aged 15–64 years.

nfd = not further defined

Certificate III/IV nfd have been distributed proportionately across certificate III and certificate IV; certificate I/II nfd across certificate I and certificate II; and certificate nfd and level not determined across certificate I, II, III and IV.

Table 3 shows the annual percentage changes in Australia's labour force by qualification level. On average, the labour force grew 1.7 per cent each year from 2001 to 2005 but the number of people with qualifications increased 3.4 per cent per year, and those without qualifications declined 0.4 per cent per year.

While the overall number of people with VET qualifications increased an average 2.5 per cent each year, the number with higher education qualifications increased 4.8 per cent each year.

Within the VET sector, the number of people with diploma and certificate IV qualifications increased substantially, albeit from low initial numbers. The numbers with advanced diploma and certificate III qualifications also increased but at a slower rate. While annual growth in the number of people with a certificate II was negligible, those with a certificate I declined 3.5 per cent per year.

A contributing factor driving the increase in the number of workers with certificates III/IV has been the employer incentives available for courses at these levels and the increased eligibility of existing workers for support.

**Table 3 Annual percentage changes in the number of persons with qualifications in the labour force, Australia, 2001–05 (%)**

Highest non-school qualification	Year-on-year change (%)					Average	Total change 2001 to 2005 (%)
	2001 to 2002	2002 to 2003	2003 to 2004	2004 to 2005			
VET	1.9	3.7	3.3	1.3	2.5	10.5	
<i>Adv diploma</i>	8.6	-5.5	5.3	0.6	2.3	8.8	
<i>Diploma</i>	15.3	13.7	8.3	6.8	11.0	51.6	
<i>Certificate IV</i>	0.0	5.2	12.9	4.5	5.7	24.2	
<i>Certificate III</i>	4.0	7.2	-0.5	-1.0	2.4	9.8	
<i>Certificate II</i>	-2.4	-1.3	4.4	1.9	0.6	2.5	
<i>Certificate I</i>	-18.0	-3.4	4.4	3.0	-3.5	-14.9	
Higher education	6.1	1.7	5.5	5.7	4.8	20.4	
With qualifications	3.4	3.0	4.2	3.0	3.4	14.2	
Without qualifications	-1.8	1.2	-3.9	3.0	-0.4	-1.6	
All	1.0	2.1	0.5	3.0	1.7	6.8	

Source: Unpublished ABS *Education and work surveys*, 2001–05 (ABS Cat. no. 6227.0). Scope: persons aged 15–64 years.

nfd = not further defined

Certificate III/IV nfd have been distributed proportionately across certificate III and certificate IV; certificate I/II nfd across certificate I and certificate II; and certificate nfd and level not determined across certificate I, II, III and IV.

## 2.2 Qualifications by gender

Table 4 shows changes in the qualifications of males and females in Australia's labour force from 2001 to 2005. Two statistics are presented to clearly show the change in the number of qualifications over this period. The first, 'Average annual', refers to the average of the year-on-year percentage changes from 2001 to 2005. The second, 'Total', refers to percentage change in the number in 2005 from that in 2001.

Female participation in Australia's labour force has been increasing over a number of years, with the result that in 2005 females comprised 45.2 per cent of the labour force.<sup>7</sup> From 2001 to 2005, the average annual increase in the number of females was 2.1 per cent compared to a 1.3 per cent increase in the number of males.

The number of females with qualifications also increased at a higher rate compared to males. Despite this, in 2005 the proportion of females with qualifications (55.6 per cent) was still lower than the proportion of males with qualifications (58 per cent), although a higher proportion of females had higher education qualifications.

Considerable differences exist in the distribution of VET qualifications that males and females hold. While certificate III was the predominant VET qualification men held, the qualifications women held were more evenly spread across all levels.

From 2001 to 2005, the number of males with advanced diploma, diploma and certificate II qualifications increased at a higher rate than the number of females. However, the rate of increase in the number of females with a certificate III was significantly higher than for males.

**Table 4 Changes in qualifications by sex, persons in the labour force, Australia, 2001–05**

Highest non-school qualification	Males				Females			
	May 2005		Change 2001–05		May 2005		Change 2001–05	
	'000	%	Average annual (%)	Total (%)	'000	%	Average annual (%)	Total (%)
VET	2,097	37.3	2.0	8.3	1,446	31.3	3.3	13.9
<i>Adv diploma</i>	214	3.8	4.6	17.6	268	5.8	0.7	2.6
<i>Diploma</i>	195	3.5	11.9	55.2	201	4.3	10.4	48.2
<i>Certificate IV</i>	155	2.8	5.6	24.0	192	4.2	6.0	24.3
<i>Certificate III</i>	1,219	21.7	0.3	0.9	355	7.7	12.3	57.6
<i>Certificate II</i>	174	3.1	3.3	13.2	260	5.6	-0.9	-3.6
<i>Certificate I</i>	140	2.5	0.4	-0.9	170	3.7	-6.2	-23.7
Higher education	1,162	20.7	4.9	20.8	1,128	24.4	4.7	20.0
With qualifications	3,260	58.0	3.0	12.5	2,574	55.6	3.9	16.5
Without qualifications	2,359	42.0	-0.8	-3.2	2,053	44.4	0.1	0.2
All	5,618	100.0	1.3	5.3	4,627	100.0	2.1	8.7

Source: Unpublished ABS *Education and work surveys*, 2001–05 (ABS Cat. no. 6227.0). Scope: persons aged 15–64 years.

nfd = not further defined

Certificate III/IV nfd have been distributed proportionately across certificate III and certificate IV; certificate I/II nfd across certificate I and certificate II; and certificate nfd and level not determined across certificate I, II, III and IV.

## 2.3 Qualifications by age

Table 5 shows that in 2005, 19.5 per cent of Australia's workforce was aged 15–24 years, 46.7 per cent 25–44 years and 33.8 per cent 45–64 years.

Not surprisingly, the proportion holding qualifications is the lowest among the 15–24 years age group, as many in this age range (particularly 15–19 years) are still likely to be in the process of acquiring their first qualification.

<sup>7</sup> From 2001 to 2005, the labour force participation rate for males aged 15–64 years increased 1.6 per cent to 84.9 per cent while that for females increased 2.5 percentage points to 69.3 per cent.

The number of workers aged 45–64 years increased four per cent per year from 2001 to 2005. Moreover, the increase was among those with and without qualifications. These trends could be a reflection of the ageing of the workforce as well as increased incidence of training among older people.

While higher education qualifications increased substantially among all age groups from 2001 to 2005, substantial increases in VET qualifications were mainly among the 45–64 years age group. Diploma qualifications also increased at a substantial rate across all age groups, but advanced diploma qualifications increased only among the 45–64 years age group. The increase in certificate III qualifications was mainly among the youngest and oldest age groups. Lower level qualifications (certificate I and II) decreased at significantly among all but the oldest age group.

**Table 5 Changes in qualifications by age, persons in the labour force, Australia, 2001–05**

Highest non-school qualification	15–24 years				25–44 years				45–64 years			
	May 2005		Change 2001–05		May 2005		Change 2001–05		May 2005		Change 2001–05	
	'000	%	Average annual (%)	Total (%)	'000	%	Average annual (%)	Total (%)	'000	%	Average annual (%)	Total (%)
VET	447	22.3	1.1	4.3	1,790	37.4	0.6	2.1	1,307	37.8	6.3	27.5
<i>Adv diploma</i>	10	0.5	-16.2	-55.1	223	4.7	-0.6	-3.0	250	7.2	7.2	30.5
<i>Diploma</i>	78	3.9	9.5	37.7	230	4.8	11.4	53.5	88	2.5	13.1	60.9
<i>Certificate IV</i>	52	2.6	3.4	8.5	179	3.7	4.9	20.1	117	3.4	9.3	40.5
<i>Certificate III</i>	202	10.1	4.0	16.1	819	17.1	0.4	1.5	554	16.0	5.2	22.1
<i>Certificate II</i>	72	3.6	-2.1	-9.7	192	4.0	-3.2	-13.0	170	4.9	9.2	38.1
<i>Certificate I</i>	34	1.7	-7.1	-30.2	148	3.1	-6.4	-24.8	129	3.7	2.2	7.7
Higher Ed.	198	9.9	4.3	17.3	1,316	27.5	4.1	17.4	776	22.4	6.1	26.7
With quals.	645	32.2	1.9	7.9	3,106	65	2.0	8.1	2,083	60.2	6.2	27.2
Without quals.	1,357	67.8	0.5	1.8	1,679	35	-2.4	-9.2	1,375	39.8	1.4	5.6
All	2,003	100.0	0.9	3.7	4,785	100.0	0.3	1.3	3,458	100.0	4.1	17.6

Source: Unpublished ABS *Education and work surveys*, 2001–05 (ABS Cat. no. 6227.0). Scope: persons aged 15–64 years.

nfd = not further defined

Certificate III/IV nfd have been distributed proportionately across certificate III and certificate IV; certificate I/II nfd across certificate I and certificate II; and certificate nfd and level not determined across certificate I, II, III and IV.

## 2.4 Qualifications by field of education

In ASCED, qualifications are defined by level and field of education. Although the main focus of this report is at the qualification level, this section briefly describes the qualifications distributions by field.

Table 6 shows the qualifications by field of education. While most qualifications in science and education are at a higher education level (more than 75 per cent), in engineering, architecture and building, and food, hospitality and personal services an even larger proportion are at a VET level (more than 80 per cent).

**Table 6 Qualifications by field of education, persons in the labour force, Australia, May 2005 (%)**

Highest non-school qualification	Field of education											All
	Science	IT	Eng.	Arch. & bldg.	Agri. & environ.	Health	Educ.	Man. & comm.	Soc. & culture	Arts	Food hosp. & pers. <sup>a</sup>	
VET	15.3	48.2	83.5	87.7	73.8	42.4	22.5	63.3	39.2	50.0	98.6	60.7
<i>Adv diploma</i>	5.1	6.1	5.4	3.4	7.7	16.2	13.7	8.6	6.0	13.3	6.9	8.3
<i>Diploma</i>	4.4	16.2	3.2	3.0	10.0	5.9	2.8	9.2	8.7	13.5	5.3	6.8
<i>Certificate IV</i>	1.2	6.1	3.5	3.4	7.3	7.7	2.6	10.0	5.7	5.1	6.0	6.0
<i>Certificate III</i>	1.1	7.9	62.0	69.3	25.1	6.5	2.2	10.5	12.7	8.8	58.3	27.0
<i>Certificate II</i>	1.8	6.5	4.7	4.0	14.4	3.3	0.7	15.4	4.0	4.7	13.6	7.4
<i>Certificate I</i>	1.7	5.5	4.6	4.5	9.4	2.8	0.6	9.6	2.2	4.5	8.6	5.3
Higher ed.	84.7	51.8	16.5	12.3	26.2	57.6	77.5	36.7	60.8	50.0	1.4	39.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total ('000)	220	233	1,178	404	178	583	428	1,357	659	245	348	5,834

Source: Unpublished ABS *Education and work surveys*, 2001–05 (ABS Cat. no. 6227.0). Scope: persons aged 15–64 years.

nfd = not further defined

Table only includes those in the labour force with qualifications.

Certificate III/IV nfd have been distributed proportionately across certificate III and certificate IV; certificate I/II nfd across certificate I and certificate II; and certificate nfd and level not determined across certificate I, II, III and IV. Not defined field codes have been distributed similarly.

<sup>a</sup>Includes mixed field.

Table 7 shows the changes in Australian workers' qualifications by level and field from 2001 to 2005.<sup>8</sup> The growth in higher education qualifications was strong in the IT, architecture and building, management and commerce, arts and food, hospitality and personal services fields. Moderate growth in VET qualifications was recorded in a number of fields, including science, IT, agriculture and environment, health, management and commerce and society and culture.

**Table 7 Average annual changes in qualifications by level and field of education, persons in the labour force, Australia, 2001–05 (%)**

Highest non-school qualification	Field of education											All
	Science	IT	Eng.	Arch. & bldg.	Agri. & environ.	Health	Educ.	Man. & comm.	Soc. & culture	Arts	Food hosp. & pers. <sup>a</sup>	
VET	4.2	6.7	0.1	1.6	5.8	4.6	0.2	4.2	4.7	3.3	3.1	2.5
<i>Adv diploma</i>	10.6	-3.4	9.7	24.2	7.7	3.6	-1.7	0.8	0.3	2.0	9.1	2.3
<i>Diploma</i>	39.2	30.2	2.3	21.8	9.5	29.7	-0.3	11.1	6.4	11.3	22.5	11.0
<i>Certificate IV</i>	13.8	1.2	1.7	7.6	5.0	1.6	5.0	10.3	5.4	3.4	16.1	5.7
<i>Certificate III</i>	69.3	17.2	-0.8	-0.5	8.2	24.2	34.8	23.3	14.5	6.7	1.6	2.4
<i>Certificate II</i>	-2.9	1.2	0.1	14.5	9.5	0.2	-6.9	0.4	-4.2	-1.1	5.9	0.6
<i>Certificate I</i>	-4.5	-0.5	5.5	21.3	-2.6	-7.8	-7.1	-6.0	-7.8	-1.8	-3.8	-3.5
Higher ed.	3.7	13.7	5.0	10.7	5.4	1.9	4.2	8.7	0.8	9.3	15.5	4.8
Total	3.4	9.9	0.8	2.5	5.7	3.0	3.2	5.7	2.2	5.9	3.1	3.4

Source: Unpublished ABS *Education and work surveys*, 2001–05 (ABS Cat. no. 6227.0). Scope: persons aged 15–64 years.

nfd = not further defined

Table only includes those in the labour force with qualifications.

Certificate III/IV nfd have been distributed proportionately across certificate III and certificate IV; certificate I/II nfd across certificate I and certificate II; and certificate nfd and level not determined across certificate I, II, III and IV. Not defined field codes have been distributed similarly.

<sup>a</sup>Includes mixed field.

<sup>8</sup> When interpreting this table, readers should bear in mind that the percentage changes reported in some cells are related to relatively small actual numbers. For instance, even though there appears to be strong growth in diplomas in the Science field, the actual numbers involved are small and even after 39.2 per cent average annual growth from 2001 to 2005 the numbers in 2005 were still only 10,000 (Appendix 2, Table A14).

## 2.5 Qualifications by part-time/full-time status of worker

Section 2.1 briefly described the qualifications profile of Australia's full-time and part-time workforce in employment in 2005. Table 8 includes the changes in their numbers from 2001 to 2005.

It shows that while full-time employment in Australia increased 1.6 per cent per year from 2001 to 2005, part-time increased by 3.6 per cent. The number of part-time workers with qualifications also increased at more than twice the annual rate for full-time workers. While the increase in full-time employment was restricted to qualified workers, part-time employment also increased for workers without qualifications.

At every qualification level other than certificate I, employment increased at a higher rate for part-time than full-time workers. Both full-time and part-time employment of people with certificate I declined, although the rate of decline among full-time workers is much higher.

**Table 8 Changes in the number of employed persons with qualifications by full-time/part-time status, Australia, 2001–05**

Highest non-school qualification	Full-time				Part-time			
	May 2005		Change 2001–05		May 2005		Change 2001–05	
	'000	%	Average annual (%)	Total (%)	'000	%	Average annual (%)	Total (%)
VET	2,581	37.3	2.2	9.3	815	29.2	5.4	23.1
<i>Adv diploma</i>	325	4.7	2.2	8.3	147	5.3	4.5	17.2
<i>Diploma</i>	285	4.1	10.4	48.1	91	3.3	13.4	64.0
<i>Certificate IV</i>	232	3.3	5.3	22.6	98	3.5	7.6	32.9
<i>Certificate III</i>	1,281	18.5	1.9	7.4	236	8.5	8.4	36.2
<i>Certificate II</i>	268	3.9	1.1	4.0	136	4.9	2.2	8.7
<i>Certificate I</i>	190	2.7	-4.0	-17.6	106	3.8	-0.2	-2.1
Higher education	1,742	25.2	4.1	17.2	488	17.5	7.7	34.5
With qualifications	4,323	62.5	3.0	12.3	1,303	46.8	6.2	27.1
Without qualifications	2,598	37.5	-0.5	-2.1	1,483	53.2	1.5	5.9
All	6,921	100.0	1.6	6.4	2,786	100.0	3.6	14.9

Source: Unpublished ABS *Education and work surveys*, 2001–05 (ABS Cat. no. 6227.0). Scope: persons aged 15–64 years.

nfd = not further defined

Certificate III/IV nfd have been distributed proportionately across certificate III and certificate IV; certificate I/II nfd across certificate I and certificate II; and certificate nfd and level not determined across certificate I, II, III and IV.

## 2.6 Qualifications by occupation

Table 9 shows the qualifications of employed people in Australia by occupation in 2005. About 90 per cent of workers in the professionals group had qualifications compared to around 66 per cent in managers and administrators, associate professionals and trades, around 50 per cent in advanced and intermediate clerical, sales and service, and around 33 per cent in the other four groups.

Although most professionals had a higher education qualification, 20.3 per cent had a VET qualification, with more than half a diploma or an advanced diploma. Many managers and administrators also had a VET qualification, although most of these were at a certificate III level.<sup>9</sup>

Almost all qualifications held in the trades were at a VET level (94.5 per cent), the highest proportion for any occupation group. The proportion of qualifications at a VET level in all other occupations was above 66 per cent, except managers and administrators (51.5 per cent) and professionals (22.7 per cent).

<sup>9</sup> Of all people with higher education qualifications, 81 per cent were employed in the three high-skill occupation groups (managers and administrators, professionals and associate professionals) (Appendix 2, Table A15).

More than half of all people with a diploma or advanced diploma were employed in the three high-skill occupation groups (managers and administrators, professionals and associate professionals) (see Appendix 2, Table A15). A significant number of people in low-skill occupations held higher education qualifications. Possible reasons for this include the temporary employment of graduates while they pursue further studies and the mismatch between jobs and qualifications for some recent immigrants.<sup>10</sup> Furthermore, the usually turnover of workers in low-skill occupations (Shah and Burke 2003b) suggests, the tenure of people with higher level qualifications in these occupations may be relatively short. There would, however, be a cause for concern with respect to skill underutilisation and efficiency if these people were locked into a cycle of low-skill jobs for lengthy periods.

**Table 9 Qualifications of employed persons by occupation, Australia, May 2005 (%)**

Highest non-school qualification	Managers & admin.	Prof.	Associate prof.	Trades	Advanced clerical & service	Intermed. clerical, sales & service	Intermed. prod. & transport	Elem. clerical, sales & service	Labourers	Total
VET	34.9	20.3	42.8	63.6	38.1	37.9	29.4	24.0	26.1	35.0
<i>Adv diploma</i>	6.6	8.1	7.2	2.2	6.1	4.7	2.0	2.6	2.0	4.9
<i>Diploma</i>	4.3	3.7	7.4	2.2	4.2	5.5	1.4	2.4	2.2	3.9
<i>Certificate IV</i>	2.7	2.8	5.8	2.9	4.1	4.8	2.0	2.3	2.1	3.4
<i>Certificate III</i>	13.2	3.3	14.4	50.4	7.5	12.6	17.5	8.4	12.5	15.6
<i>Certificate II</i>	4.7	1.3	4.7	3.0	8.9	6.5	3.3	4.9	4.3	4.2
<i>Certificate I</i>	3.4	1.2	3.5	2.9	7.3	3.8	3.1	3.3	2.8	3.0
Higher education	32.9	69.3	21.6	3.7	13.9	11.7	3.6	7.3	4.3	23.0
With qualifications	67.8	89.6	64.5	67.3	51.9	49.6	33.0	31.3	30.3	58.0
Without quals.	32.2	10.4	35.5	32.7	48.1	50.4	67.0	68.7	69.7	42.0
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
All ('000)	762	1,862	1,233	1,224	376	1,588	823	996	843	9,707

Source: Unpublished ABS *Education and work surveys*, 2001–05 (ABS Cat. no. 6227.0). Scope: persons aged 15–64 years.

nfd = not further defined

Certificate III/IV nfd have been distributed proportionately across certificate III and certificate IV; certificate I/II nfd across certificate I and certificate II; and certificate nfd and level not determined across certificate I, II, III and IV. Not defined occupation codes have been distributed similarly.

Table 10 shows the average annual changes in employment by qualification and occupation from 2001 to 2005.<sup>11</sup> Employment of people with VET qualifications increased by 2.9 per cent per year, and of those with higher education qualifications by 4.8 per cent.

Employment growth varied across occupations, ranging from an expansion of 4.6 per cent per year in the associate professionals group to a contraction of 2.4 per cent per year in the advanced clerical and service group. The growth rate was below average in the trades, intermediate clerical, sales and service, intermediate transport and production and labourers groups.

Employment of people with diplomas and higher education qualifications increased across all occupations, although in some low-skill occupations the increases were from relatively low initial numbers.

<sup>10</sup> For some university graduates, a job in one of these occupations is a stepping stone into the labour market. To support themselves, some students who have already completed an initial qualification hold jobs in these occupations while completing a higher degree. It is also well known that immigrants often suffer from 'occupational downgrading' in the destination country (Shah and Burke 2005; Chiswick, Lee and Miller 2005). Therefore immigrants with higher education qualifications are often found working in low-skill occupations. Limited access to welfare support during the initial settlement period can also mean that some immigrants accept jobs at a lower skill level than their pre-migration jobs.

<sup>11</sup> Note that some changes are from a relatively low base.

**Table 10 Average annual changes in employment by qualification and occupation, Australia, 2001–05 (%)**

Highest non-school qualification	Managers & admin.	Prof.	Associate prof.	Trades	Advanced clerical & service	Intermed. clerical, sales & service	Intermed. prod. & transport	Elem. clerical, sales & service	Labourers	Total
VET	4.9	1.6	6.0	1.3	-1.0	2.9	2.7	5.5	4.0	2.9
<i>Adv diploma</i>	8.3	-0.7	6.8	12.6	-1.5	0.7	13.6	8.2	4.0	2.8
<i>Diploma</i>	15.9	6.1	13.0	13.2	8.1	10.7	16.5	14.1	27.3	11.0
<i>Certificate IV</i>	3.7	5.2	8.1	9.4	-1.2	6.3	12.5	8.9	9.3	5.9
<i>Certificate III</i>	3.2	3.5	7.0	0.0	7.4	8.0	0.2	10.5	3.5	2.7
<i>Certificate II</i>	12.4	-0.5	4.1	4.7	-0.6	-1.4	4.2	2.7	5.3	1.4
<i>Certificate I</i>	0.8	0.7	-4.7	9.7	-4.6	-8.7	5.3	0.2	-3.8	-2.9
Higher education	8.2	3.3	7.8	7.7	2.7	4.3	11.6	15.3	6.1	4.8
With quals.	6.3	2.9	6.6	1.6	-0.1	3.1	3.3	7.4	4.2	3.7
Without quals.	0.3	1.2	1.7	1.6	-4.4	-0.9	1.0	1.3	-0.3	0.2
All	4.2	2.7	4.6	1.6	-2.4	1.0	1.7	3.0	1.0	2.1

Source: Unpublished ABS *Education and work* surveys, 2001–05 (ABS Cat. no. 6227.0). Scope: persons aged 15–64 years.

nfd = not further defined

Certificate III/IV nfd have been distributed proportionately across certificate III and certificate IV; certificate I/II nfd across certificate I and certificate II; and certificate nfd and level not determined across certificate I, II, III and IV. Not defined occupation codes have been distributed similarly.

## 2.7 Summary

This chapter has provided an analysis of the trends in the qualifications held by Australians aged 15–64 years from 2001 to 2005. The main focus was on the group in the labour force, particularly those in employment.

From 2001 to 2005, the Australian **labour force** (the employed plus the unemployed) aged 15–64 years changed in the following ways:

- The participation rate increased two percentage points to 77.1 per cent.
- The labour force increased by 6.8 per cent to 10.24 million people, but the number with qualifications increased by 14.2 per cent to 5.83 million.
- Not only did the number of females in the labour force increase at a faster rate (2.1 per cent per year) than males (1.2 per cent per year), but the number with qualifications also increased at a faster rate. Despite this, females comprised 45.2 per cent of the labour force and 44.1 per cent of those with qualifications in 2005. A higher percentage of the qualifications held by females in 2005 were at a higher education level (24.4 per cent) compared to those held by males (20.7 per cent). While VET qualifications held by males were mostly at certificates III and IV, those held by females were more evenly spread across all levels.
- The number of people aged 45–64 years increased 4.1 per cent per year, which is a much higher rate than for any other age group. Moreover, the number with qualifications in this age group also increased at a relatively fast rate. Higher education and diploma qualifications increased substantially among all age groups, but increases in other VET qualifications were mainly among the oldest age group.

In 2005, in the Australian **labour force** aged 15–64 years:

- 38.7 per cent of the unemployed and 33.2 per cent of those not in the labour force had qualifications compared to 58 per cent of the employed.
- 34.6 per cent had VET qualifications (8.6 per cent diploma/advanced diploma, 18.8 per cent certificate III/IV, and 7.2 per cent certificate I/II) and 22.4 per cent had higher education qualifications.
- the male and female participation rates were 84.9 and 69.3 per cent, respectively.

The changes in **employment** of people aged 15–64 years from 2001 to 2005 were:

- Employment increased 8.7 per cent to 9.71 million, while the number with qualifications increased 15.4 per cent to 5.63 million.
- Employment of people with higher education qualifications increased at a faster rate (4.8 per cent per year) than of people with VET qualifications (2.9 per cent per year). By 2005, 58 per cent held qualifications (34.6 per cent VET and 22.4 per cent higher education). Of those with a VET qualification, 25 per cent had a diploma/advanced diploma, 54.4 per cent had a certificate III/IV and 20.6 per cent a certificate I/II.
- Part-time employment increased at more than twice the annual rate (3.6 per cent) for full-time employment (1.6 per cent). While the increase in full-time employment was restricted to qualified workers, part-time employment also increased for workers without qualifications.
- Employment growth varied across occupations, ranging from an expansion of 4.6 per cent per year in the associate professionals group to a contraction of 2.4 per cent per year in the advanced clerical and service group. Employment of people with diplomas and higher education qualifications increased across all occupations.
- In 2005, about 90 per cent of workers in the professionals group held qualifications compared to around 66 per cent in managers and administrators, associate professionals and trades, around 50 per cent in advanced and intermediate clerical, sales and service, and around 33 per cent in the other four groups.

## 3 Forecasts of employment and required numbers with qualifications

This chapter presents forecasts of employment by occupation and qualification in Australia in 2016. These occupational forecasts are derived using the MONASH model, with the forecasts of qualifications extrapolated from historical trends in skills deepening as observed from 2001 to 2005. The MONASH model is maintained by the Centre of Policy Studies (CoPS), Monash University.

Implied in these forecasts are requirements for additional numbers of qualified workers. The two sources of these additional numbers are qualified new entrants (the result of growth and net replacement [*turnover*] needs in each occupation) and existing workers who gain new qualifications or upgrade to higher levels. Estimates are provided of the numbers in each of these two groups in the next ten years to meet qualifications targets for 2016.

The data reported in this chapter are for all age groups, consistent with estimates based on data from *Labour force surveys* (ABS Cat. no. 6202.0)<sup>12</sup>.

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### 3.1 Employment trends and forecasts

Figure 1 shows employment trend in Australia for the past ten<sup>13</sup> years and forecasts for the next decade. Employment steadily increased from 8.35 million in 1997 to 10.04 million in 2006.<sup>14</sup> The MONASH model forecasts continuing employment growth over the next decade.<sup>15</sup> Annual growth is, however, forecast to average 1.1 per cent, which is significantly lower than the 2.1 per cent historical rate from 1997 to 2006. In 2016, employment is forecast to be 11.23 million.<sup>16</sup>

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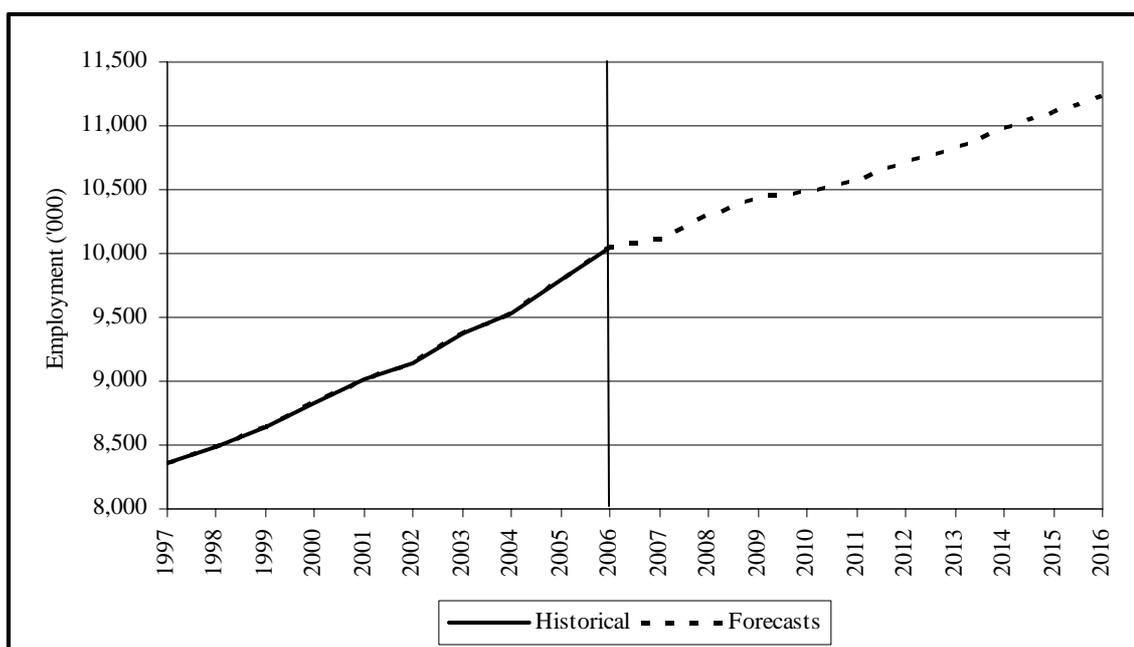
<sup>12</sup> Therefore, some estimates reported here may differ slightly from those in chapter 2. The analyses in chapter 2 used data from the *Education and work survey* (ABS Cat. no. 6227.0), which (as already discussed) has a somewhat narrower scope.

<sup>13</sup> This period was chosen to coincide with the introduction of the *Australian Standard Classification of Occupations* (ASCO) second edition.

<sup>14</sup> In this chapter, the year refers to the financial year. For example, 1997 refers to the financial year ending June 1997. The historical annual data are derived by averaging employment in the months of August, November, February and May of the financial year.

<sup>15</sup> CoPS forecasts (December 2005) revised in March 2006, are for 2006 to 2013. Forecasts for 2014 to 2016 are extrapolated from these, with the forecast for 2006 replaced by the actual.

<sup>16</sup> The projection of employment in Australia for 2016 reported in Productivity Commission (2005) was slightly lower at 11.1 million

**Figure 1 Employment trends, Australia, 1997–06 (actual) 2007–16 (forecasts)**

Source: Based on unpublished original ABS Labour Force data for every third month from August 1996 to May 2006, (ABS Cat. no. 6202.0) and Monash Economic Forecasts 2007–2013 (CoPS December 2005). Forecasts for 2014 and 2016 are extrapolated from the Monash forecasts.

The employment forecasts for 2016 by major occupation groups are shown in Table 11. It shows a shift in the profile towards high-skill occupations. Above average growth is forecast in the three high-skill (managers, professionals and associate professionals) and intermediate clerical, sales and service groups. In trades and advanced clerical and service, the forecast is for a decline in employment, although the decline is expected to be marginal in the trades. More Australians will be employed as associate professionals than as tradespersons in 2016.

**Table 11 Employment by occupation, Australia, 2006 and 2016**

Occupation group	Actual 2006		Forecasts 2016		% change 2006–16
	'000	%	'000	%	
Managers & administrators	847	8.4	1,020	9.1	20.5
Professionals	1,951	19.4	2,258	20.1	15.7
Associate professionals	1,240	12.4	1,505	13.4	21.3
Tradespersons	1,273	12.7	1,268	11.3	-0.4
Advanced clerical & service	402	4.0	375	3.3	-6.6
Intermediate clerical, sales & service	1,658	16.5	1,884	16.8	13.6
Intermediate production & transport	823	8.2	914	8.1	11.0
Elementary clerical, sales & service	984	9.8	1,075	9.6	9.2
Labourers	863	8.6	933	8.3	8.1
All	10,042	100.0	11,233	100.0	11.9

Source: Unpublished ABS *Labour force surveys*, August 2005 to May 2006, (ABS Cat. no. 6202.0) and CEET extrapolation of Monash Economic Forecasts (CoPS December 2005).

### 3.2 Employment forecasts by occupation and qualification

This section presents forecasts of employment in 2016 by occupation and qualification under two scenarios. In each scenario, the total employment by occupation is assumed to be as shown in section 3.1. Scenario I provides baseline data for comparative purposes and assumes the qualifications distributions within occupations in 2016 to be the same as observed in 2005. In Scenario II, the trends in skills deepening (as observed in the period 2001–05) are assumed to continue in the forecast period.

### 3.2.1 Scenario I – ‘no change’

Assuming the distribution of qualifications by occupation as observed in 2005, Table 12 shows employment in 2006<sup>17</sup> by qualification and occupation. It provides a benchmark for later comparisons.

**Table 12 Employment by qualification and occupation, Australia, 2006, (%)**

Highest non-school qualification	Managers & admin.	Prof.	Associate prof.	Trades	Advanced clerical & service	Intermed. clerical, sales & service	Intermed. prod. & transport	Elem. clerical, sales & service	Labourers	Total
VET	34.7	20.1	43.0	63.6	37.6	38.0	29.5	24.1	26.3	35.0
<i>Adv diploma</i>	6.6	7.9	7.3	2.1	6.2	4.7	1.9	2.6	2.0	4.9
<i>Diploma</i>	4.3	3.6	7.4	2.2	4.2	5.5	1.3	2.4	2.2	3.9
<i>Certificate IV</i>	2.7	2.8	6.0	3.0	4.0	4.8	2.1	2.3	2.1	3.4
<i>Certificate III</i>	13.0	3.3	14.3	50.4	7.5	12.7	17.7	8.4	12.7	15.7
<i>Certificate II</i>	4.7	1.3	4.7	3.0	8.7	6.5	3.3	4.9	4.4	4.2
<i>Certificate I</i>	3.4	1.2	3.5	2.8	7.2	3.8	3.2	3.3	2.9	3.0
Higher education	32.9	69.5	21.5	3.7	14.2	11.7	3.5	7.3	4.3	23.3
With quals.	67.7	89.6	64.5	67.2	51.7	49.7	33.0	31.4	30.6	58.3
Without quals.	32.3	10.4	35.5	32.8	48.3	50.3	67.0	68.6	69.4	41.7
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
All ('000)	847	1,951	1,240	1,273	402	1,658	823	984	863	10,042

Table 13 shows the forecasts for qualifications by occupations in 2016 under Scenario I (forecasts at the person level are included in Table A16 in Appendix 2). The shift towards occupations with higher proportions of qualified workers means the overall proportion with qualifications is slightly higher in 2016 than in 2005 (see Table 9). The proportion with VET qualifications is expected to be almost unchanged although a slight shift towards higher level VET qualifications is anticipated.

**Table 13 Scenario I: Forecasts of qualifications by occupation, Australia, 2016 (%)**

Highest non-school qualification	Managers & admin.	Prof.	Associate prof.	Trades	Advanced clerical & service	Intermed. clerical, sales & service	Intermed. prod. & transport	Elem. clerical, sales & service	Labourers	Total
VET	34.7	20.1	42.3	63.4	36.0	38.2	29.4	24.0	26.5	34.5
<i>Adv diploma</i>	6.6	7.9	7.0	2.2	6.2	4.7	2.0	2.6	2.0	5.0
<i>Diploma</i>	4.3	3.6	7.3	2.3	3.9	5.7	1.4	2.4	2.2	4.0
<i>Certificate IV</i>	2.7	2.9	5.6	2.9	4.1	4.7	2.0	2.4	2.1	3.4
<i>Certificate III</i>	13.0	3.2	14.2	50.3	7.4	12.8	17.7	8.4	12.9	15.1
<i>Certificate II</i>	4.7	1.3	4.7	3.0	7.7	6.4	3.2	4.9	4.3	4.1
<i>Certificate I</i>	3.4	1.2	3.5	2.8	6.7	3.8	3.1	3.3	2.9	3.0
Higher education	33.4	69.3	22.1	3.7	15.1	11.8	3.6	7.2	4.3	24.2
With quals.	68.2	89.4	64.5	67.1	51.0	50.0	33.1	31.2	30.8	58.7
Without quals.	31.8	10.6	35.5	32.9	49.0	50.0	66.9	68.8	69.2	41.3
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
All ('000)	1,020	2,258	1,505	1,268	375	1,884	914	1,075	933	11,233

### 3.2.2 Scenario II – ‘skills deepening’

Scenario II assumes trends in skills deepening in occupations, as observed from 2001 to 2005, to continue in the forecast period. Analyses in chapter 2 indicated strong evidence of skills deepening with a bias towards higher level qualifications. In any occupation, skills deepening generally results

<sup>17</sup> Employment for 2006 is calculated by averaging the employment for August 2005, November 2005, February 2006 and May 2006.

in the proportion of people with qualifications increasing and/or the qualifications distribution skewing towards higher skill levels over time.

The skills deepening rate is defined as the difference in the percentage change in the number of people with qualifications and the percentage change in employment. In each occupation, the rate is calculated at each qualification level. For instance, if employment in an occupation increased 10 per cent in and the number of people with qualifications of a particular type increased 15 per cent, then the skills deepening rate is five *points*. Box 1 sets out the mathematical formula for calculating these rates.

### Box 1 Formula for calculating skills deepening rates

The skills deepening rate at qualification  $i$  in occupation  $j$  at time  $t$  is calculated as:

$$S_{ijt} = Q_{ijt} - O_{jt} \quad (1)$$

where  $Q_{ijt}$  is the percentage change in the number of people with qualification  $i$  in occupation  $j$  in the time period  $[t-1, t]$  and  $O_{jt}$  is the percentage change in total number of people employed in occupation  $j$  in the same period.

Table 14 shows that from 2001 to 2005 skills deepening in Australia's employed workforce averaged 1.5 points per year. While at the higher education level it averaged 2.7 points, at the VET level it averaged 0.8 points. Within VET, it varied from 8.9 points at the diploma level to negative five points at certificate I.

The table also indicates variation in skills deepening across occupations. For example, the overall rates in elementary clerical, sales and service and labourers groups are relatively high compared to in the professionals group. These differences reflect the relative 'maturity' of the different occupations. Mature occupations already have a high proportion of workers with qualifications and thus further skills deepening is likely to be at a reduced rate.

The overall skills deepening rate in the trades is relatively low, although at specific qualifications it is significant (11.1 points at advanced diploma and 11.6 points at diploma). Skills deepening in the trades may have been inhibited by reported skill shortages in recent years as new workers with less than optimal skills may have been employed.

The skills deepening rates at the diploma level in intermediate production and transport (14.8 points) and labourers (26.4 points) groups appear to be outliers. When projecting qualifications in 2016, these outliers were replaced by the overall skills deepening rate at the diploma level (8.9 points).

**Table 14 Average skills deepening rates by qualification and occupation, Australia, 2001–05 (points)**

Highest non-school qualification	Managers & admin.	Prof.	Associate prof.	Trades	Advanced clerical & service	Intermed. clerical, sales & service	Intermed. prod. & transport	Elem. clerical, sales & service	Labourers	All
VET	0.7	-1.1	1.4	-0.2	1.5	1.9	1	2.5	3	0.8
<i>Adv diploma</i>	4.2	-3.4	2.2	11.1	1	-0.3	11.9	5.2	3.1	0.7
<i>Diploma</i>	11.8	3.4	8.4	11.6	10.5	9.7	14.8	11.1	26.4	8.9
<i>Certificate IV</i>	-0.4	2.6	3.5	7.8	1.3	5.3	10.8	5.9	4	3.8
<i>Certificate III</i>	-0.9	0.8	2.3	-1.6	9.8	7.1	-1.5	7.5	2.5	0.6
<i>Certificate II</i>	8.3	-3.2	-0.5	3.1	1.9	-2.3	2.5	-0.3	4.4	-0.7
<i>Certificate I</i>	-3.3	-2	-9.3	8.1	-2.1	-9.7	3.6	-2.8	-4.8	-5
Higher education	4.1	0.6	3.2	6.1	5.2	3.4	9.9	12.3	3	2.7
All	2.2	0.2	1.9	0	2.3	2.2	1.6	4.4	3.3	1.5

\*As these estimates seem like outliers, the overall average of 8.9 per cent is instead used in the employment projection model.

Box 2 provides the mathematical formulae for projecting qualifications in 2006 and 2016 by occupation under Scenario II.

The projections of qualifications in 2006 and 2016 under Scenario II are shown in Tables 15 and 16, respectively (projections at the person level are included in Table A17 and A18 in Appendix 2). They show 71.2 per cent of people employed in Australia in 2016 having a qualification (41.6 per cent VET and 29.6 per cent higher education).

In all but two (intermediate production and transport and labourers) occupation groups, more than half the workers are projected to have qualifications in 2016. In the three high-skill groups (managers, professionals and associate professionals) at least 80 per cent are expected to have qualifications.

Most VET qualifications will be at a certificate III/IV (53.3 per cent), with 31.5 per cent at a diploma/advanced diploma and 15.2 per cent at a certificate I/II.

**Table 15 Scenario II: Forecasts of qualifications by occupation, Australia, 2006 (%)**

Highest non-school qualification	Managers & admin.	Prof.	Associate prof.	Trades	Advanced clerical & service	Intermed. clerical, sales & service	Intermed. prod. & transport	Elem. clerical, sales & service	Labourers	Total
VET	35.7	20.0	44.0	63.8	38.8	39.1	30.0	25.1	27.0	35.7
<i>Adv diploma</i>	7.0	7.7	7.3	2.4	6.2	4.7	2.2	2.7	2.1	4.9
<i>Diploma</i>	4.7	3.7	8.1	2.4	4.5	6.0	1.6	2.6	2.4	4.2
<i>Certificate IV</i>	2.7	2.9	6.1	3.2	4.2	5.1	2.3	2.4	2.2	3.6
<i>Certificate III</i>	12.9	3.3	14.6	49.6	8.2	13.6	17.5	9.1	13.1	15.8
<i>Certificate II</i>	5.1	1.2	4.6	3.1	8.7	6.4	3.4	4.9	4.5	4.2
<i>Certificate I</i>	3.3	1.2	3.1	3.1	7.0	3.4	3.2	3.3	2.8	2.9
Higher education	34.2	69.9	22.3	3.9	14.9	12.1	3.9	8.2	4.4	23.8
With quals.	69.9	89.9	66.1	67.7	53.7	51.2	34.0	33.3	31.4	59.5
Without quals.	30.1	10.1	33.9	32.3	46.3	48.8	66.1	66.7	68.6	40.5
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
All ('000)	847	1,951	1,240	1,273	402	1,658	823	984	863	10,042

**Table 16 Scenario II: Forecasts of qualifications by occupation, Australia, 2016 (%)**

Highest non-school qualification	Managers & admin.	Prof.	Associate prof.	Trades	Advanced clerical & service	Intermed. clerical, sales & service	Intermed. prod. & transport	Elem. clerical, sales & service	Labourers	Total
VET	45.0	18.9	51.0	66.3	49.7	51.1	35.1	35.7	34.4	41.6
<i>Adv diploma</i>	9.7	4.9	8.4	4.8	6.9	4.6	4.6	4.0	2.7	5.5
<i>Diploma</i>	9.9	5.0	13.4	5.2	8.4	11.8	2.7	5.3	4.4	7.6
<i>Certificate IV</i>	2.6	3.7	7.3	5.5	4.7	7.4	4.4	3.9	3.0	5.0
<i>Certificate III</i>	11.7	3.5	17.6	41.6	15.4	22.8	14.9	15.4	16.5	17.2
<i>Certificate II</i>	8.9	0.8	4.3	4.0	9.3	4.5	4.2	4.8	6.4	4.4
<i>Certificate I</i>	2.1	0.9	0.0	5.3	5.1	0.0	4.3	2.3	1.4	1.8
Higher education	43.2	73.5	29.8	6.1	23.6	16.2	7.6	17.0	5.7	29.6
With quals.	88.1	92.4	80.9	72.5	73.4	67.3	42.7	52.7	40.1	71.2
Without quals.	11.9	7.6	19.1	27.5	26.6	32.7	57.3	47.3	59.9	28.8
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
All (000)	1,020	2,258	1,505	1,268	375	1,884	914	1,075	933	11,233

**Box 2 Steps for projecting employment in 2016 by occupation and qualification****Step 1**

Calculate the number of people with qualification  $j$  employed in occupation  $i$  in 2016 as:

$$E_{ij2016} = E_{i2016} \times p_{ij2005} \times (1 + \bar{S}_{ij} \times 11) \quad (2)$$

where  $E_{i2016}$  is the forecast of employment for occupation  $i$  in 2016;  $p_{ij2005}$  is the proportion employed in occupation  $i$  with qualification  $j$  in 2005; and  $\bar{S}_{ij}$  is the average annual skills deepening rate in occupation  $i$  at qualification  $j$ . The skills deepening rates are calculated at the major occupation group level using data described in chapter 2. This means the skill deepening rates in all occupations within any major group will be the same.

**Step 2**

Adjust for negative values from Step 1.<sup>18</sup>

For some occupations, the above calculation may result in a negative value of  $E_{ij2016}$  for one or more occupations. If this were to happen, the negative value is set to zero and the number of people with the next higher level qualification in the same occupation is adjusted down such that the sum across all qualification levels is still equal to the aggregate forecast for the occupation in 2016. For example, if from Step 1 the employment projected at certificate I and II in a given occupation are -10 and 30, respectively, then the above procedure adjusts these values to 0 and 20, respectively.

**Step 3**

Calculate the number of people without qualifications ( $j = 0$ ) in occupation  $i$  in 2016 as:

$$E_{oi2016} = E_{i2016} - \sum_j E_{ij2016} \quad (3)$$

**Step 4**

Adjust for negative values resulting from Step 3.

The adjustment at this step is similar to that described in Step 2. If an adjustment is for an occupation in the managers and administrators or professionals group, then the number of people with higher education qualifications is adjusted in a similar way to that in step 2, otherwise the numbers of people with VET qualifications are proportionately adjusted.<sup>19</sup>

Table 17 shows that in 2016, 1.19 million more Australians are expected to be in employment than in 2006. While the number with qualifications is expected to increase by about 2.02 million, or 11.7 percentage points, the number without qualifications is expected to decline by about 830,000.

Although the proportions of people with higher education and VET qualifications are expected to increase by about the same percentage points, within VET the changes are expected to vary by level, ranging from an increase of 3.4 percentage points in the proportion with diplomas to 1.1 percentage point decline in the proportion with certificates I.

The qualifications profiles within occupations are also expected to change in varying degrees. For example, the proportion of people with qualifications in the advanced clerical and service group is

<sup>18</sup> These adjustments were only occasionally required and only at certificate I level. The net effect of the adjustment was 0.05 percentage point increase in the percentage with certificate I and a corresponding decrease in the proportion with certificate II.

<sup>19</sup> The aggregate effect of the adjustments was small. Without the adjustments the percentage with qualifications in 2016 would be 0.8 percentage points higher, with most of the increase at the higher education level.

expected to increase by 19.6 percentage points but in the professionals group the corresponding increase is only 2.4 percentage points. The proportion with qualifications among professionals was already 89.6 per cent in 2005.

The percentage of people with VET qualifications is expected to increase in all occupation groups except professionals. In addition, in some occupations the distribution of VET qualifications will change. For instance, while the proportion of tradespersons with certificate III is expected to be eight percentage points lower in 2016 than 2006, the proportion with higher level qualifications will increase.

**Table 17 Scenario II: Changes in qualifications by occupation, Australia, 2006–16 (percentage points)**

Highest non-school qualification	Managers & admin.	Prof.	Associate prof.	Trades	Advanced clerical & service	Intermed.	Intermed. prod. & transport	Elem.	Labourers	Total
						clerical, sales & service		clerical, sales & service		
VET	9.3	-1.2	7.1	2.6	10.9	11.9	5.0	10.6	7.4	5.9
<i>Adv diploma</i>	2.8	-2.7	1.0	2.4	0.7	-0.1	2.4	1.3	0.6	0.6
<i>Diploma</i>	5.1	1.3	5.4	2.7	3.8	5.8	1.2	2.7	2.0	3.4
<i>Certificate IV</i>	-0.1	0.8	1.2	2.3	0.5	2.3	2.2	1.5	0.8	1.4
<i>Certificate III</i>	-1.1	0.2	3.0	-8.0	7.2	9.2	-2.6	6.3	3.4	1.4
<i>Certificate II</i>	3.8	-0.4	-0.3	0.9	0.5	-1.9	0.8	-0.1	1.9	0.2
<i>Certificate I</i>	-1.1	-0.2	-3.1	2.2	-1.9	-3.4	1.1	-0.9	-1.4	-1.1
Higher education	8.9	3.6	7.6	2.2	8.7	4.1	3.7	8.7	1.3	5.8
With quals.	18.2	2.4	14.7	4.8	19.6	16.0	8.7	19.4	8.7	11.7
Without quals.	-18.2	-2.4	-14.7	-4.8	-19.6	-16.0	-8.7	-19.4	-8.7	-11.7
With quals. ('000)	307	331	397	57	59	418	110	239	103	2021
Without quals. ('000)	-134	-24	-132	-62	-86	-192	-20	-148	-33	-830
All ('000)	173	307	265	-5	-26	226	91	91	70	1,191

### 3.3 Additional numbers required with qualifications

Section 3.2 provided forecasts of employment by occupation and qualification in Australia in 2016 under two scenarios. Given recent trends in skills deepening, the qualifications profile of the employed in 2016 is more likely to be as projected under Scenario II (which accounts for skills deepening). However, government and industry support will be necessary if the projected qualifications profile were to be realised.

This section develops a methodology for estimating the additional numbers of people who will need to be trained in the next ten years if the qualifications profile suggested in Scenario II were to be the target to aim for.

Estimating the additional numbers of qualified people required by 2016 is important for planning the delivery of VET and ensuring it has sufficient resources. Estimates can be compared with the current output of the VET system to determine the extent to which it will need to adjust to meet the qualifications targets under Scenario II.

Additional numbers of workers with qualifications for any occupation consist of *new entrants* with qualifications (new workers required due to growth in an occupation and new workers to replace the net numbers who leave) and *existing workers* who gain or upgrade their qualifications.

Not all new entrants to an occupation have qualifications, just as not every existing worker upgrades their qualifications. Existing workers who undertake additional training which leads to a higher qualification are counted towards meeting the targets for qualified workers. Others who undertake training at the same level or at a lower level than the qualification they currently hold, even if it is in a different field, are deemed not to add to Australia's current stock of qualified workers.

The model for estimating the additional numbers of people with qualifications is developed in two parts. In the first part, the numbers of new entrants from 2006 to 2016 is estimated and in the second part the numbers of existing workers who gain or upgrade qualifications is estimated. The model provides estimates of the number of qualifications required at each level in each occupation.

### 3.3.1 Calculations of new entrants with qualifications

This section aims to estimate the number of new entrants to each occupation by qualification from 2006 to 2016.

In any occupation, job openings for new entrants result from growth and net replacement needs. Net replacement needs are mostly due to typically experienced and older workers retiring from the workforce (due to age or ill health), emigration or death, and are net of those who are re-entering after a temporary absence. If employment in an occupation declines, then the new workers to that occupation are a result of net replacement needs only (Bureau of Labor Statistics 2006).

As new entrants in any occupation are generally the youngest, their qualifications profile is also likely to be similar to that of workers of that age. Similarly, the qualifications profile of leavers (who will need to be replaced) is likely to be similar to that of the oldest in an occupation.

Box 3 details the steps for calculating the number of new entrants from 2006 to 2016 by qualification and occupation.

Table 18 shows the numbers of new entrants with qualifications from 2006 to 2016. The qualifications distributions by occupation are included in Table 19. New entrants without qualifications, who make up a certain proportion in each occupation, are not included in these tables.

Over 2.25 million new entrants with qualifications are expected to enter occupations in Australia from 2006 to 2016. Of these, 54.1 per cent are expected to have VET qualifications and 45.9 per cent higher education qualifications. While certificate III will be the most common VET qualification of new entrants, a significant number will have a diploma (15 per cent). Relatively small numbers of new entrants will have qualifications at the advanced diploma (3.6 per cent) and certificate I (2.5 per cent) levels.

Overall, 55.1 per cent of new entrants with qualifications are expected to enter occupations in the three high-skill occupation groups (managers, professionals and associate professionals). A further 28.6 per cent will enter intermediate and elementary clerical, sales and service occupations and 16.3 per cent will enter occupations in the other four groups (only 5.6 per cent will enter the trades). The relatively high number of new entrants to some low-skill occupations is associated with relatively high turnover in these occupations.

More than half the qualifications of new entrants to all occupations, except professionals, will be at a VET level.

**Table 18 Scenario II: New entrants by qualification and occupation, Australia, 2006–16 ('000)**

Non-school qualification	Managers & admin.	Prof.	Associate prof.	Trades	Intermed.		Elem.		Labourers	Total
					Advanced clerical & service	clerical, sales & service	Intermed. prod. & transport	clerical, sales & service		
VET	154	90	222	120	49	283	73	161	64	1,216
<i>Adv diploma</i>	20	9	17	2	4	11	5	12	1	81
<i>Diploma</i>	47	37	77	14	10	86	7	44	16	338
<i>Certificate IV</i>	12	20	35	9	5	30	12	17	8	148
<i>Certificate III</i>	41	16	70	66	21	122	28	59	19	442
<i>Certificate II</i>	26	4	20	15	7	30	11	21	17	151
<i>Certificate I</i>	8	4	3	14	2	4	10	8	3	56
Higher education	143	486	143	7	29	81	17	119	7	1,032
All	297	576	365	127	78	364	90	280	71	2,248

**Table 19 Scenario II: Qualifications by occupation, new entrants, Australia, 2006–16 (%)**

Non-school qualification	Managers & admin.	Prof.	Associate prof.	Trades	Advanced clerical & service	Intermed. clerical, sales & service	Intermed. prod. & transport	Elem. clerical, sales & service	Labourers	Total
VET	51.9	15.6	60.8	94.5	62.8	77.7	81.1	57.5	90.1	54.1
<i>Adv diploma</i>	6.7	1.6	4.7	1.6	5.1	3.0	5.6	4.3	1.4	3.6
<i>Diploma</i>	15.8	6.4	21.1	11.0	12.8	23.6	7.8	15.7	22.5	15.0
<i>Certificate IV</i>	4.0	3.5	9.6	7.1	6.4	8.2	13.3	6.1	11.3	6.6
<i>Certificate III</i>	13.8	2.8	19.2	52.0	26.9	33.5	31.1	21.1	26.8	19.7
<i>Certificate II</i>	8.8	0.7	5.5	11.8	9.0	8.2	12.2	7.5	23.9	6.7
<i>Certificate I</i>	2.7	0.7	0.8	11.0	2.6	1.1	11.1	2.9	4.2	2.5
Higher education	48.1	84.4	39.2	5.5	37.2	22.3	18.9	42.5	9.9	45.9
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

### 3.3.2 Calculations of existing workers gaining or upgrading qualifications

This section provides estimates of the total numbers of existing workers by occupation expected to gain or upgrade their qualifications from 2006 to 2016. It excludes those who undertake courses that either do not lead to a recognised qualification or lead to a qualification at a lower level than currently held, as they will not affect Australia's overall qualifications profile.

The calculations involve identifying workers in 2006 likely to still be employed in 2016, and comparing their qualifications at these two points in time. Workers leaving employment during this period are assumed to be the oldest in the group. The positive difference in the expected number of stayers with qualifications in 2016 compared to the number in 2006 provides a measure of the number of existing workers upgrading qualifications from 2006 to 2016. Note that this calculation is made at each qualification level. Box 4 details the steps for calculating these numbers.

Table 20 shows the number of existing workers gaining or upgrading qualifications from 2006 to 2016. The distributions of these qualifications by occupation are shown in Table 21. The calculations do not distinguish between different levels of higher education qualifications and, therefore, individuals who upgrade to another higher education level are not identified.

A total of 1.78 million existing workers are expected to acquire qualifications to levels higher than they currently hold (70.5 per cent VET and 29.5 per cent higher education). Although the most common VET qualification that existing workers will acquire is also a certificate III (26.3 per cent) a relatively large proportion are expected to acquire an advanced diploma (14.9 per cent). In contrast, only 3.6 per cent of new entrants with qualifications are expected to have an advanced diploma.

Of all existing workers acquiring qualifications, 40.7 per cent will be in the three high-skill occupations (managers and administrators, professionals and associate professionals) and 10.5 per cent in the trades. The corresponding proportions of new entrants with qualifications to these occupations were 55.1 and 5.6 per cent, respectively.

Despite being a mature occupation group, a relatively high number of existing workers in the professionals group will acquire qualifications. Some of these will be upgrading from a diploma to a higher education qualification (eg. some older nurses and teachers).

**Box 3 Steps for calculating the number of new entrants by occupation and qualification****Step 1**

For each occupation, estimate the number of new entrants from 2006 to 2016 as a proportion of the employment in the occupation in 2016.

Suppose  $r_i$  is the ten-year net replacement rate<sup>20</sup> and  $g_i$  is the ten-year growth rate in occupation  $i$ .

Then the ten-year new entrants' rate as a percentage is calculated as:

$$n_i = \begin{cases} \frac{r_i + g_i}{g_i + 100} \times 100 & \text{if } g_i > 0 \\ \frac{r_i}{g_i + 100} \times 100 & \text{if } g_i \leq 0 \end{cases} \quad (4)$$

The above formula assumes that if employment declines in the occupation then jobs for new entrants will be a result of net replacement needs only.

**Step 2**

Among those employed in 2016, estimate the proportion of new entrants to occupation  $i$  who are aged  $k$  (age is measured in 5-year intervals).

In occupation  $i$ , suppose  $\alpha_{ik}$  is the proportion of new entrants and  $p_{ik}$  is the proportion of *all* workers aged  $k$ . If it is assumed that in any occupation new entrants are the youngest workers, then the following relationship must necessarily hold:

$$n_i = \sum_k \alpha_{ik} p_{ik} \quad (5)$$

Given estimates of  $n_i$  from (4), relationship (5) can be used to calculate  $\alpha_{ik}$ . For each occupation, all but one of the  $\alpha_{ik}$ 's have values either zero or one.

**Step 3**

Estimate the number of new entrants by qualification and occupation.

Suppose  $E_{ij2016}$  is the forecast for the number of people with qualification  $j$  employed in occupation  $i$  in 2016 and  $\delta_{ijk}$  is the proportion of them in aged  $k$ . The number of new entrants with qualification  $j$  to occupation  $i$  is then calculated as:

$$N_{ij2016} = \sum_k E_{ij2016} \delta_{ijk} \alpha_{ik} \quad (6)$$

The summation in (6) is over all age groups.

The  $\delta_{ijk}$ s are calculated using data from *Education and work surveys*. Thus the calculations assume the age profile within each occupation-qualification subgroup will remain invariant over the next decade.

<sup>20</sup> The estimates of net replacement rates used for this report were produced by CEET in July 2006.

**Box 4 Steps for calculating existing workers gaining or upgrading qualifications****Step 1**

Estimate the number of workers with qualification  $j$  in occupation  $i$  in 2016 who are existing workers:

$$X_{ij2016} = E_{ij2016} - N_{ij2016} \quad (7)$$

**Step 2**

Among those aged  $k$  in occupation  $i$  in 2006, estimate the proportion  $\beta_{ik}$  that will also be employed in 2016 (stayers or existing workers). Assuming that those who leave are the oldest and, therefore, existing workers the youngest in any occupation, the proportion that is existing workers is:

$$s_i = (100 - r_i) \quad (8)$$

where the ten-year net replacement rate for occupation  $i$  is  $r_i$ .

This means that the following relationship must necessarily hold:

$$s_i = \sum_k \beta_{ik} p_{ik} \quad (9)$$

where the proportion aged  $k$  of people employed in occupation  $i$  in 2016 is  $p_{ik}$ .

Since  $s_i$  is known, relationship (9) can be used to determine  $\beta_{ik}$  using a similar method to that used for determining  $\alpha_{ik}$  in (5).

**Step 3**

Among those in employment in 2006, estimate the number of who will be existing workers in occupation  $i$  with qualification  $j$  in 2016 as:

$$S_{ij2006} = \sum_k E_{ij2006} a_{ijk} \beta_{ik} \quad (10)$$

The summation in (10) is over all age groups.

**Step 4**

Estimate the number of existing workers who will need to gain or upgrade qualifications in the ten years to 2016 as:

$$D_{ij2016} = \begin{cases} X_{ij2016} - S_{ij2006} & \text{if } X_{ij2016} > S_{ij2006} \\ 0 & \text{Otherwise} \end{cases} \quad (11)$$

**Table 20 Scenario II: Existing workers by qualification and occupation, Australia, 2006–16 ('000)**

Non-school qualification	Managers & admin.	Prof.	Associate prof.	Trades	Advanced clerical & service	Intermed. clerical, sales & service	Intermed. prod. & transport	Elem. clerical, sales & service	Labourers	Total
VET	137	78	200	156	28	274	79	184	122	1,258
<i>Adv diploma</i>	52	11	54	42	4	25	29	32	17	266
<i>Diploma</i>	24	21	44	24	6	53	8	7	11	198
<i>Certificate IV</i>	1	23	21	28	1	47	14	18	8	161
<i>Certificate III</i>	17	19	74	26	12	149	8	98	65	468
<i>Certificate II</i>	43	1	7	9	4	0	7	18	20	109
<i>Certificate I</i>	0	3	0	27	1	0	13	11	1	56
Higher education	95	126	90	32	14	76	30	38	26	527
All	232	204	290	188	42	350	109	222	148	1,785

**Table 21 Scenario II: Qualifications of existing workers by occupation, Australia, 2006–16 (%)**

Non-school qualification	Managers & admin.	Prof.	Associate prof.	Trades	Advanced clerical & service	Intermed. clerical, sales & service	Intermed. prod. & transport	Elem. clerical, sales & service	Labourers	Total
VET	59.1	38.5	68.8	83.0	67.6	78.4	72.2	82.8	82.3	70.5
<i>Adv diploma</i>	22.2	5.6	18.5	22.5	9.4	7.2	26.9	14.5	11.2	14.9
<i>Diploma</i>	10.3	10.3	15.1	12.8	14.5	15.1	7.3	3.1	7.6	11.1
<i>Certificate IV</i>	0.6	11.3	7.1	14.7	2.3	13.5	12.8	8.1	5.4	9.0
<i>Certificate III</i>	7.2	9.4	25.6	13.9	29.2	42.5	7.4	44.3	44.3	26.3
<i>Certificate II</i>	18.6	0.5	2.5	4.6	9.9	0.1	6.0	8.0	13.4	6.1
<i>Certificate I</i>	0.2	1.5	0.0	14.4	2.2	0.0	11.8	4.9	0.4	3.1
Higher education	40.9	61.5	31.2	17.0	32.4	21.6	27.8	17.2	17.7	29.5
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

### 3.3.3 Total additional numbers required with qualifications

Finally, the total numbers required with qualifications from 2006 to 2016 to meet the targets under Scenario II will be the sum of new entrants and existing workers gaining or upgrading qualifications. The requirements for each occupation are calculated as:

$$T_{ij2016} = N_{ij2016} + D_{ij2016} \quad (10)$$

Table 22 includes the total additional numbers with qualifications required from 2006 to 2016 to meet the targets under Scenario II. Table 23 shows the distribution of these qualifications by occupation and Table 24 summarises the qualifications requirements.

The total number of workers required with qualifications is 4.03 million, 61.3 per cent with a VET qualification and 38.7 per cent with a higher education qualification. This represents about half the total number of people expected to be employed in 2016 who will have a qualification. The forecast of total employment is 11.23 million in 2016.

**Table 22 Scenario II: Total additional numbers required with qualifications by occupation, Australia, 2006–16 ('000)**

Non-school qualification	Managers & admin.	Prof.	Associate prof.	Trades	Advanced clerical & service	Intermed.	Intermed. prod. & transport	Elem. clerical, sales & service	Labourers	Total
						clerical, sales & service		clerical, sales & service		
VET	291	168	422	276	77	557	152	345	186	2,474
<i>Adv diploma</i>	72	20	71	44	8	36	34	44	18	347
<i>Diploma</i>	71	58	121	38	16	139	15	51	27	536
<i>Certificate IV</i>	13	43	56	37	6	77	26	35	16	309
<i>Certificate III</i>	58	35	144	92	33	271	36	157	84	910
<i>Certificate II</i>	69	5	27	24	11	30	18	39	37	260
<i>Certificate I</i>	8	7	3	41	3	4	23	19	4	112
Higher education	238	612	233	39	43	157	47	157	33	1,559
All	529	780	655	315	120	714	199	502	219	4,033

**Table 23 Scenario II: Total additional numbers required with qualifications by occupation, Australia, 2006–16 (%)**

Non-school qualification	Managers & admin.	Prof.	Associate prof.	Trades	Advanced clerical & service	Intermed.	Intermed. prod. & transport	Elem. clerical, sales & service	Labourers	Total
						clerical, sales & service		clerical, sales & service		
VET	55.0	21.5	64.4	87.6	64.2	78.0	76.4	68.7	84.9	61.3
<i>Adv diploma</i>	13.6	2.6	10.8	14.0	6.7	5.0	17.1	8.8	8.2	8.6
<i>Diploma</i>	13.4	7.4	18.5	12.1	13.3	19.5	7.5	10.2	12.3	13.3
<i>Certificate IV</i>	2.5	5.5	8.5	11.7	5.0	10.8	13.1	7.0	7.3	7.7
<i>Certificate III</i>	11.0	4.5	22.0	29.2	27.5	38.0	18.1	31.3	38.4	22.6
<i>Certificate II</i>	13.0	0.6	4.1	7.6	9.2	4.2	9.0	7.8	16.9	6.4
<i>Certificate I</i>	1.5	0.9	0.5	13.0	2.5	0.6	11.6	3.8	1.8	2.8
Higher education	45.0	78.5	35.6	12.4	35.8	22.0	23.6	31.3	15.1	38.7
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Table 24 Scenario II: Summary of total additional numbers with qualifications required, Australia, 2006–16**

Non-school qualification	Employment in 2016		Persons with qualifications required in the ten years to 2016					
			Existing workers gaining or upgrading				Total	
	'000	%	'000	%	'000	%	'000	%
VET	4,669	58.4	1,216	54.1	1,258	70.5	2,473	61.3
<i>Adv diploma</i>	620	7.8	81	3.6	266	14.9	346	8.6
<i>Diploma</i>	859	10.7	338	15.0	198	11.1	536	13.3
<i>Certificate IV</i>	556	7.0	148	6.6	161	9.0	310	7.7
<i>Certificate III</i>	1,933	24.2	442	19.7	468	26.3	911	22.6
<i>Certificate II</i>	494	6.2	151	6.7	109	6.1	259	6.4
<i>Certificate I</i>	206	2.6	56	2.5	56	3.1	111	2.8
Higher education	3,325	41.6	1,032	45.9	527	29.5	1,559	38.7
All	7,994	100.0	2,248	100.0	1,785	100.0	4,033	100.0

### 3.4 Summary

This chapter provided projections of the number of people in employment in Australia in 2016 by occupation and qualification under two Scenarios. In Scenario I, the qualifications profile of people in employment was assumed to remain the same as in 2005. In contrast, Scenario II assumed the significant skills deepening in occupations, discussed in chapter 2, to continue into the future.

From 2006 to 2016 the occupational and qualification composition of employment in Australia is forecast to change in the following ways:

- Employment in Australia will grow more slowly in the coming decade. It is forecast to increase by 1.1 per cent per year, increasing from 10.04 million in 2006 to 11.23 million in 2016. This is significantly lower than the 2.1 per cent annual growth rate for the previous decade.
- Employment will grow more quickly in higher than lower skilled occupations. High employment growth is forecast in high-skill occupations (managers and administrators, professionals and associate professionals). In advanced clerical and service and trades a decline is forecast, although in the trades the decline is marginal. In all other occupation groups the forecast is for relatively moderate growth. Consequently, the occupational profile is expected to shift towards high-skill occupations. By 2016, more Australians are expected to be employed as associate professionals than as tradespersons.
- The proportion of people in employment with a post-school qualification will increase. Assuming that skills deepening trends within occupations continue over the next decade, over 71.2 per cent of Australia's employed workforce in 2016 will have some post-school qualification (58.4 per cent VET and 41.6 per cent higher education). The number of employed people with qualifications will increase by over two million and the number without qualifications will decline by 840,000.
- In most occupations, more than half the workers will have qualifications. Only in intermediate production and transport and labourers groups will less than half of all workers have qualifications. In the three high-skill groups (managers and administrators, professionals and associate professionals) the proportion with qualifications is expected to be more than 80 per cent.
- More workers will have higher level qualifications. In particular, the employment of people holding a diploma is forecast to more than double to 860,000. In contrast, the employment of people holding a certificate I will decline by 30.2 per cent to 206,000.

Additional people will be required to be trained over the next ten years to lift the proportion of people in employment with qualifications to 71.2 per cent. While a majority of these people will be new entrants, substantial numbers of existing workers will need to gain, or upgrade, qualifications if this target is to be achieved.

In the ten years to 2016:

- Over four million Australians will need to acquire qualifications. Of these, about 2.25 million will be new entrants to an occupation and about 1.78 million will be existing workers.
- Most qualifications acquired will need to be at the VET level. About 61.4 per cent of qualifications will need to be at the VET level and 39.6 per cent at the higher education level. This translates to 2.47 million net completions of VET qualifications and 1.56 million net completions of higher education qualifications.
- Just over half the qualifications of new entrants will be at the VET level. Of all new entrants who will acquire qualifications, 54.1 per cent will be at a VET level (18.6 per cent diploma/advanced diploma, 26.3 per cent certificate III/IV and 9.2 per cent certificate I/II) and 45.9 per cent will be at a higher education level.

- More than half of all new entrants with qualifications will be in the three high-skill occupations. About 55.1 per cent of all new entrants with qualifications will be in the three high-skill groups (managers and administrators, professionals and associate professionals) with another 28.6 per cent in intermediate and elementary clerical, sales and service and 16.3 per cent in the other four groups (only 5.6 per cent will be in the trades).
- Most existing workers gaining or upgrading qualifications will be to a VET level. In all, 70.5 per cent of qualifications acquired by existing workers will be at a VET level (26 per cent diploma/advanced diploma, 35.3 per cent certificate III/IV and 9.2 per cent certificate I/II) and 29.5 per cent at a higher education level.
- Most existing workers who acquire qualifications will be in intermediate or low-skill occupations. Only 40.7 per cent of existing workers acquiring qualifications will be in the three high-skill groups (managers and administrators, professionals and associate professionals). The proportion in the trades will be 10.5 per cent

## 4 Potential supply of persons with VET qualifications

This chapter analyses the current patterns of enrolment and completion of VET courses in Australia from 2001 to 2005. These patterns help to assess the numbers of people with VET qualifications likely to be available to Australia's labour force from 2006 to 2016.

### 4.1 Data and scope of analysis

The VET system is the most important source of supply of people with vocational qualifications in Australia.

The bulk of VET activity is either fully or partially funded by the public. The *National VET Provider Collection* includes data on this activity from each state and territory training authority. More precisely, the data on enrolments in this collection includes:

- all VET delivered by TAFE and other government providers, multi-sector higher education institutions, and some registered community providers, including fee-for-service activity<sup>21</sup>; and
- publicly funded VET delivered by registered private providers.

It excludes data on training activity related to:

- recreation, leisure and personal enrichment activity ('non-vocational' programs);
- fee-for-service delivery by private providers;
- delivery undertaken at overseas campuses of Australian VET institutions;
- credit transfer; and
- VET delivered in schools, where the delivery has been undertaken by schools.

The *National VET Provider Collection* includes data on enrolments in all courses, including those in which students intend to access modules<sup>22</sup> only and non-award courses. The actual numbers of course enrolments are generally higher than the number of students, as some students enrol in multiple courses or modules throughout a year. Some students undertake courses at the same or lower level, perhaps in a different field, than the course they may have completed previously.

However, the scope of the data on completions in the *National VET Provider Collection* is different to that for data on enrolments as it includes some completions resulting from fee-for-service activity of private providers. Unlike enrolment data, the completions data in the collection do not have a flag for the funding source. This makes it difficult, if not impossible, to have the same scope for enrolment and completions data. Private providers are not required to report any of their fee-for-service activity to state authorities. While some providers in some jurisdictions do report it when the publicly funded activity is reported, the extent is unknown. In this respect, data on completions are likely to underestimate the total supply from the training sector in Australia.

Even within the current scope of data collection, there is still a degree of under reporting of completions data. Improved reporting and collection procedures are likely to provide higher completions as a percentage of enrolments in the future.

<sup>21</sup> Including data on full-fee paying overseas and domestic students enrolled at any of these institutions.

<sup>22</sup> For administrative reasons some students are enrolled in a course even if their intention is to only access a few modules that comprise the course. However, there are other enrolments which are explicitly recorded as 'module only' without any course codes attached. These enrolments are excluded from NCVER reports of course enrolments. They are, however, included in the count of students and hours of VET delivery.

The main focus of this chapter is to assess the potential supply of people with VET qualifications to meet future requirements of Australia's labour market under Scenario II. For this reason, the analysis is restricted to people aged 15–64 years.<sup>23</sup> People undertaking qualifications at the same or lower level than they previously completed do not add to or change the distribution of Australia's overall stock of qualified workers. Therefore, they are not counted towards meeting future requirements for qualifications.

Since requirements are measured in terms of the numbers of *people* with qualifications, and not the number of courses being completed, only the highest level course a student enrolls in or completes in a year is included in the analysis.

Many students in VET enrol in and complete only modules or non-award courses which do not lead to a recognised qualification under the Australian Qualifications Framework (AQF). A small number are also enrolled in degree courses. These students will not add to, or change the distribution of, the stock of people with VET qualifications for meeting future requirements, and therefore are excluded from this analysis.

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## 4.2 Patterns of enrolment in VET courses, 2001–05

This section describes student enrolment patterns in VET courses in Australia from 2001 to 2005. For any student with multiple course enrolments in a given year, only information on the major course is included. The descriptions are by a number of demographic and course variables.

### 4.2.1 Student enrolments in VET courses

Table 25 shows the numbers of students aged 15–64 years enrolled in VET courses in Australia from 2001 to 2005. The year-to-year changes in these numbers are included in Table 26.

From 2001 to 2005, an average of 1.62 million students enrolled in VET courses each year. The number enrolled in courses which lead to the award of a qualification was about 1.12 million and in courses such as module only and non-award courses it was about half a million.<sup>24</sup> The number of course enrolments was obviously much higher at 1.96 million, with 1.48 million of these at award levels.

The trend in enrolments shows a small decline of 0.5 per cent per year from 2001 to 2005, largely due to declining enrolments in non-award courses. The proportion of students in award courses increased from 68.5 per cent of the total in 2001 to 69.7 per cent in 2005.

At each qualification level, except certificates I and III, fewer students were enrolled in 2005 than in 2001 despite an overall increase in the number of students enrolled in award courses. After a small initial increase, enrolments at the advanced diploma level declined each year, with a significant fall in 2004. Similarly, enrolments at the diploma level also declined each year, although the drop in numbers in 2005 was marginal. Enrolments at certificate IV seem to have peaked in 2003.

The decline at the diploma level appears paradoxical given the rapid growth in the employment of people with skills at this level from 2001 to 2005 (as noted in chapter 2). However, employment of people with particular skills can rise even when the numbers being trained with those skills is declining. This can happen if people with those skills are available from among those not employed or through net migration. The numbers in training could also decline without affecting supply if completion rates improve or the length of training is shortened, perhaps due to improved methods

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<sup>23</sup> The number of persons outside this age range who are will participate in the labour market is expected to be small.

<sup>24</sup> Some of the annual variation in the data is due to administrative changes in collection methods in some jurisdictions. These changes included the introduction of a unique student identifier in record keeping in Queensland in 2003 and software problems relating to the collection of data from the adult and community education sector data in New South Wales in 2004.

of recognition of prior learning. As will be discussed in section 4.3.1 below, qualification completions at the diploma level have, in fact, been increasing recently. Some additional supply of qualifications not captured in the *National VET Provider Collection* will be discussed in section 4.4. At certificate III, enrolments increased each year from 2001 to 2005, although by varying amounts and with the largest increase in 2005. In contrast, enrolments at certificate II declined each year. This suggests substitution from certificate II to higher qualifications. A possible cause of this is the changes in employer incentives which came into force following the 2002 *Incentives Review*. From 1 July 2003, the commencement incentive for an apprentice undertaking a certificate III or IV was increased to \$1,650, which is \$275 more than the commencement incentive applying to a certificate II. In addition, the completion incentive for certificates III and IV was increased by \$1,100 to \$2,750. Furthermore, in 1999 eligibility rules for existing workers were changed to restrict incentives to certificates III and IV with a nominal training contract of two years or more only, unless the apprenticeship was eligible to attract the *Rural and Regional Skill Shortage Incentive* (DEST 2004).

Enrolments at certificate I increased sharply in 2002 and 2005 but fell in the intervening years. As numbers at this level were more likely to have been affected by data collection problems in the adult and community education (ACE) sector in New South Wales<sup>25</sup>, it is difficult to ascertain any emerging trend from the current data.

**Table 25 VET course enrolments by qualification of major course, Australia, 2001–05**

Qualification of major course	'000					%				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
Adv diploma	48	50	49	43	40	2.9	3.1	2.9	2.7	2.5
Diploma	149	143	136	130	129	9.1	8.7	8.1	8.3	8.1
Certificate IV	188	193	197	188	178	11.5	11.7	11.8	12.1	11.1
Certificate III	370	380	398	406	435	22.6	23.1	23.9	26.1	27.2
Certificate II	288	283	259	243	242	17.6	17.2	15.5	15.6	15.2
Certificate I	78	85	83	78	89	4.7	5.1	5.0	5.0	5.5
All award courses	1,121	1,133	1,122	1,088	1,114	68.5	69.1	67.2	69.9	69.7
Others <sup>1</sup>	517	508	548	469	486	31.5	30.9	32.8	30.1	30.4
All	1,637	1,641	1,670	1,557	1,599	100.0	100.0	100.0	100.0	100.0

Source: Unpublished NCVER data. Scope: persons aged 15–64 years.

<sup>1</sup> Includes module only enrolments, non-award and miscellaneous education courses and a small number enrolled in Degree courses.

Notes: (a) In 2003, Queensland introduced a unique student identifier for all students in the state covered by the collection. This resulted in a reduction in overall student numbers in 2003 compared to previous years. (b) NSW student numbers in the ACE sector in 2004 were affected by software incompatibility problems which resulted in a reduction in numbers, mainly in non-award courses, for that year. (c) Course information is about the major course enrolled in.

**Table 26 Annual changes in VET course enrolments by qualification of major course, Australia, 2001–05**

Qualification of major course	Year-on-year change (%)					Total change 2001 to 2005 (%)
	2001 to 2002	2002 to 2003	2003 to 2004	2004 to 2005	Average	
Adv diploma	4.4	-2.2	-13.5	-5.1	-4.1	-16.2
Diploma	-3.8	-5.4	-4.2	-0.6	-3.5	-13.4
Certificate IV	2.6	2.3	-4.4	-5.5	-1.2	-5.1
Certificate III	2.7	4.9	1.9	7.2	4.2	17.7
Certificate II	-1.9	-8.4	-6.1	-0.2	-4.2	-15.9
Certificate I	8.7	-2.0	-5.5	13.2	3.6	14.0
All award courses	1.1	-1.0	-3.0	2.4	-0.1	-0.6
Others <sup>1</sup>	-1.6	7.9	-14.4	3.5	-1.1	-5.9
All	0.3	1.8	-6.7	2.7	-0.5	-2.3

Source: Unpublished NCVER data. Scope: persons aged 15–64 years.

<sup>1</sup> Includes module only enrolments, non-award and miscellaneous education courses and a small number enrolled in Degree courses.

Notes: (a) In 2003, Queensland introduced a unique student identifier for all students in the state covered by the collection. This resulted in a reduction in overall student numbers in 2003 compared to previous years. (b) NSW student numbers in the ACE sector in 2004 were affected by software incompatibility problems which resulted in a reduction in numbers, mainly in non-award courses, for that year. (c) Course information is about the major course enrolled in.

<sup>25</sup> See footnote 23.

### 4.2.2 Student enrolment in VET courses by gender

Table 27 shows that in 2005, 51.8 per cent of Australian students aged 15–64 years enrolled in VET courses were male. A relatively higher proportion of male enrolments were in certificate III courses (which include traditional trade apprenticeships) while relatively higher proportions of female enrolments were in diploma and certificate IV courses.

From 2001 to 2005, female enrolments in VET declined at more than twice the average annual rate of male enrolments. A possible explanation for this is that females have been ‘crowded out’ of VET as new apprenticeships predominantly undertaken by males expanded strongly in the last few years as a result of government policies. Expansion of new apprenticeships has generally been unrestricted but this may have been at the expense of reduced resources to other areas of VET in which females are more likely to participate.

The decline in numbers at advanced diploma was much higher for females than for males but the opposite was true at the diploma level. While the number of males enrolled at certificate IV declined, female numbers remained largely unchanged.

At certificate I and III, where both male and female enrolments increased, the average annual rate of increase from 2001 to 2005 was higher for males than females.

**Table 27 VET course enrolments by sex of student, Australia, 2001–05**

Qualification of major course	Males				Females			
	2005		Change 2001–05		2005		Change 2001–05	
	‘000	%	Average annual (%)	Total (%)	‘000	%	Average annual (%)	Total (%)
Adv diploma	23	2.8	-2.1	-9.6	17	2.2	-6.4	-23.8
Diploma	57	6.8	-5.7	-20.9	72	9.4	-1.6	-6.4
Certificate IV	83	10.0	-2.7	-10.8	95	12.3	0.2	0.4
Certificate III	249	30.0	4.7	20.2	186	24.1	3.5	14.5
Certificate II	122	14.7	-4.3	-16.3	121	15.7	-4.1	-15.5
Certificate I	50	6.0	4.1	16.3	39	5.1	3.0	11.3
All award courses	584	70.4	-0.1	-0.4	530	68.8	-0.2	-0.8
Others <sup>1</sup>	246	29.6	-0.5	-3.1	240	31.2	-1.6	-8.6
All	829	100.0	-0.3	-1.2	770	100.0	-0.7	-3.4

Source: Unpublished NCVER data. Scope: persons aged 15–64 years.

<sup>1</sup> Includes module only enrolments, non-award and miscellaneous education courses and a small number enrolled in Degree courses.

Notes: (a) In 2003, Queensland introduced a unique student identifier for all students in the state covered by the collection. This resulted in a reduction in overall student numbers in 2003 compared to previous years. (b) NSW student numbers in the ACE sector in 2004 were affected by software incompatibility problems which resulted in a reduction in numbers, mainly in non-award courses, for that year. (c) Course information is about the major course enrolled in. (d) Students for whom information on gender was unavailable were assigned male/female status on a proportionate basis.

### 4.2.3 Student enrolment in VET courses by age

Table 28 shows student enrolments in VET in three age groups. In 2005, 56 per cent of all students in VET were aged 25–44, a further 23.7 per cent were aged 15–24 and 20.3 per cent were aged 45–64.

A much higher proportion of younger than older students was enrolled in award courses in 2005 – 83.8 per cent of those aged 15–24 years compared to just 53.3 per cent of those aged 45–64 years. However, older people were more likely to be enrolled in higher level courses (certificate IV or higher) and younger people more likely to be enrolled in lower level courses (certificate III or lower).

From 2001 to 2005, while the number of students aged 25–44 years enrolled in VET declined by an average 1.8 per cent per year the numbers enrolled in the other two age groups actually increased.

Enrolments in advanced diploma courses increased only among students aged 15–24 years.

Enrolments in diploma courses declined across all age groups.

Strong growth in enrolments in certificate I and III courses was recorded among the 15–24 and 45–64 years age groups. Among the 25–44 years group, strong growth in enrolments is recorded only in certificate III courses.

**Table 28 VET course enrolments by age of student, Australia, 2001–05**

Qualification level of major course	15–24 years				25–44 years				45–64 years			
	2005		Change 2001–05		2005		Change 2001–05		2005		Change 2001–05	
	'000	%	Average annual (%)	Total (%)	'000	%	Average annual (%)	Total (%)	'000	%	Average annual (%)	Total (%)
Adv diploma	10	2.7	1.4	3.6	27	3.0	-5.6	-21.4	4	1.1	-5.4	-20.3
Diploma	26	7.0	-3.1	-11.7	85	9.5	-4.1	-15.5	18	5.5	-1.1	-4.8
Certificate IV	23	6.2	-0.1	-0.6	117	13.1	-1.9	-7.8	38	11.6	0.3	1.0
Certificate III	133	35.1	5.1	22.1	245	27.4	3.6	15.0	57	17.6	4.7	19.7
Certificate II	97	25.6	0.4	1.2	108	12.0	-7.8	-27.8	38	11.7	-3.2	-12.7
Certificate I	28	7.3	6.2	26.0	42	4.7	0.8	1.7	19	5.8	7.3	31.1
All award crs.	317	83.8	2.3	9.5	623	69.6	-1.6	-6.2	173	53.3	1.1	4.1
Others <sup>1</sup>	61	16.2	-0.2	-1.3	272	30.4	-2.3	-10.0	152	46.7	0.8	0.6
All	378	100.0	1.9	7.6	896	100.0	-1.8	-7.4	325	100.0	0.8	2.4

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

<sup>1</sup> Includes module only enrolments, non-award and miscellaneous education courses and a small number enrolled in Degree courses.

Notes: (a) In 2003, Queensland introduced a unique student identifier for all students in the state covered by the collection. This resulted in a reduction in overall student numbers in 2003 compared to previous years. (b) NSW student numbers in the ACE sector in 2004 were affected by software incompatibility problems which resulted in a reduction in numbers, mainly in non-award courses, for that year. (c) Course information is about the major course enrolled in. (d) Students for whom information on age was unavailable were assigned male/female status on a proportionate basis.

#### 4.2.4 Student enrolments in training packages

From 2001 to 2005, the number of training packages available to students increased from 62 to 81. Student enrolments in training packages increased from 549,000 to 854,000 over this period. A majority of enrolments at the advanced diploma and certificate I levels in 2005 were not in training packages.

Enrolments in most training packages were relatively few. For this reason the following discussion concentrates on training packages with high numbers of enrolments. As Table 29 shows, four out of every five training package enrolments were in just 20 packages in 2005. Furthermore, a third of all enrolments were in just three packages – business services, community services and hospitality.

The most common qualification undertaken in training packages was a certificate III and the least common was an advanced diploma. Enrolments in each training package were generally clustered at one or two qualification levels. For example, in assessment and workplace training almost all enrolments were at certificate IV, in general construction they were mostly at certificate III and in Australian meat industry they were mostly at certificate II.

More than two-thirds of all enrolments in financial services were at certificate IV or higher qualification levels. In contrast, more than half of all enrolments in Australian meat industry, retail, information technology, amenity horticulture, food processing industry, rural production and hospitality packages were at lower qualification levels – certificate I and II.

**Table 29 Enrolments in training package with 10,000 or more students by qualification level, Australia, 2005 (%)**

Training package (TP) with 10,000 or more enrolments	%							Total	
	Adv diploma	Diploma	Certificate IV	Certificate III	Certificate II	Certificate I	Total	'000	% of total TP enrolments
Business services	2.3	16.6	26.6	33.0	17.0	4.5	100.0	123.3	14.4
Community services	1.1	22.9	18.1	52.6	5.2	0.1	100.0	84.4	9.9
Hospitality	3.8	6.8	5.2	43.8	36.6	3.7	100.0	75.9	8.9
Information technology	0.3	15.7	15.2	15.5	36.1	17.2	100.0	49.2	5.8
Metal and engineering industry	0.0	1.2	13.6	60.2	17.3	7.7	100.0	40.0	4.7
Retail	0.0	0.6	2.2	38.7	57.2	1.3	100.0	37.9	4.4
Auto indust. retail, serv. & repair	0.0	0.2	0.4	71.6	16.8	10.9	100.0	35.9	4.2
General construction	0.2	1.4	0.0	88.4	4.2	5.6	100.0	32.1	3.8
Financial services	20.1	20.9	24.1	34.8	0.1	0.0	100.0	30.6	3.6
Transport and distribution	0.2	1.1	3.1	60.2	28.5	6.9	100.0	29.3	3.4
Electrotechnology industry	10.5	0.4	2.3	76.9	2.6	7.2	100.0	26.7	3.1
Assessment and wkplace training	0.0	2.1	97.9	0.0	0.0	0.0	100.0	22.5	2.6
Amenity horticulture	0.1	4.7	4.5	39.1	44.4	7.2	100.0	18.1	2.1
Rural production	0.7	11.9	10.3	36.8	38.5	1.8	100.0	16.3	1.9
Hairdressing	0.0	0.5	0.9	74.6	24.0	0.0	100.0	15.1	1.8
Food processing industry	0.0	0.0	0.1	55.0	26.2	18.7	100.0	14.3	1.7
Tourism	5.9	29.0	8.5	39.9	15.2	1.3	100.0	13.4	1.6
Australian meat industry	0.0	1.0	3.7	30.2	63.8	1.4	100.0	12.5	1.5
Health	3.3	18.6	14.3	40.7	23.1	0.0	100.0	11.7	1.4
Telecommunications	1.1	0.8	13.0	73.3	11.7	0.0	100.0	10.0	1.2
TP with <10,000 enrolments	1.3	9.9	18.6	42.5	25.2	2.5	100.0	154.8	18.1
All TP enrolments	2.3	10.0	15.6	45.3	22.3	4.5	100.0	853.7	100.0
Non-TP enrolments	2.8	5.8	6.1	6.5	7.0	6.7	100.0		
All enrolments	2.5	8.1	11.1	27.2	15.2	5.5	100.0		
All TP enrolments ('000)	19.3	85.8	132.8	386.7	190.3	38.7	853.7		
Non-TP enrolments ('000)	21.1	43.4	45.2	48.4	52.1	49.9	260.1		
All enrolments ('000)	40.4	129.2	178.1	435.1	242.4	88.6	1,113.7		

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

Module only enrolments, non-award and miscellaneous education courses and a small number enrolled in Degree courses are excluded from the table. In 2005, they represented 65.1 per cent of the 745,000 non-training package enrolments.

#### 4.2.5 Overseas student enrolments in VET courses

The total number of overseas students enrolled in VET is relatively small compared to numbers in higher education. Nevertheless they are a potential source of skilled labour supply as many apply for permanent residency after completing their qualification. Changes in Australia's migration policy in the last several years have made it easier for students to convert their residency status while living in Australia. Under the points-based skilled migration system, bonus points are awarded for qualifications acquired from Australian training institutions.

Table 30 shows the annual enrolment of overseas students changed little from about 21,000 students between 2001 and 2005. However, there was a small increase in enrolments in higher level courses (eg. diploma and certificate III), and a corresponding decline in enrolments in lower level courses. These trends may be associated with changes in the rules for skilled migration which tend to favour higher level skills. The proportion of overseas students enrolling in non-award courses also increased from 2001 to 2005, with nearly a quarter of all students enrolling in such courses in 2005.

**Table 30 Overseas student enrolments in VET courses, Australia, 2001–05**

Qualification of major course	'000					%				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
Adv diploma	4.1	3.9	4.3	3.2	3.0	19.3	18.3	19.5	14.8	13.8
Diploma	6.2	6.9	6.6	6.9	7.3	29.0	32.2	29.8	31.7	33.0
Certificate IV	2.8	2.5	2.3	2.4	2.4	12.9	11.7	10.4	11.1	11.0
Certificate III	1.9	1.9	2.4	2.5	2.8	8.9	8.6	10.7	11.5	12.7
Certificate II	1.5	1.7	1.5	1.3	1.1	7.1	7.7	6.7	6.0	4.8
Certificate I	0.4	0.3	0.1	0.4	0.3	2.0	1.3	0.6	1.9	1.2
All award courses	16.9	17.2	17.1	16.6	16.8	79.3	79.9	77.7	77.0	76.4
Others <sup>1</sup>	4.4	4.3	4.9	5.0	5.2	20.8	20.1	22.3	23.0	23.6
All	21.3	21.5	22.1	21.6	22.0	100.0	100.0	100.0	100.0	100.0

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

<sup>1</sup> Includes module only enrolments, non-award and miscellaneous education courses and a small number enrolled in Degree courses.

Notes: (a) In 2003, Queensland introduced a unique student identifier for all students in the state covered by the collection. This resulted in a reduction in overall student numbers in 2003 compared to previous years. (b) NSW student numbers in the ACE sector in 2004 were affected by software incompatibility problems which resulted in a reduction in numbers, mainly in non-award courses, for that year. (c) Course information is about the major course enrolled in.

#### 4.2.6 Previous highest qualification of students enrolled in VET courses

Many students already have a previous post-school qualification when enrolling in a VET course. This previous qualification could be from the VET or higher education sector and in some cases at the same or higher level than the course they enrol in. Table 31 shows the previous highest qualification for students in 2005.

Of all students enrolled in VET courses in 2005, 21.1 per cent had a previous qualification, with 5.7 per cent at a higher education level.<sup>26</sup> The previous qualification of half of these students was at the same or higher level than their current course (see shaded cells in Table 31).<sup>27</sup>

**Table 31 Previous highest qualification of students enrolled in VET courses by qualification of current course, Australia, 2005 (%)**

Qualification level of current major course	Previous qualification								Total	
	Higher education	Adv diploma	Diploma	Certificate IV	Certificate III	Certificate II	Certificate I	Others <sup>2</sup>	%	'000
Adv diploma	7.7	3.0	8.4	7.7	7.2	0.5	0.0	65.6	100.0	40.4
Diploma	7.8	1.7	5.3	9.4	10.7	0.5	0.1	64.4	100.0	129.2
Certificate IV	10.4	1.7	4.6	5.3	12.9	1.1	0.1	63.8	100.0	178.1
Certificate III	3.5	0.8	2.0	1.7	6.2	2.4	0.2	83.3	100.0	435.1
Certificate II	4.1	0.7	1.9	1.4	4.5	1.7	0.5	85.1	100.0	242.4
Certificate I	4.0	0.7	1.7	1.1	2.8	0.8	0.6	88.4	100.0	88.6
All award courses	5.5	1.1	3.0	3.3	7.2	1.6	0.2	78.1	100.0	1,113.7
Others <sup>1</sup>	6.4	1.2	2.6	2.3	5.8	0.7	0.2	80.7	100.0	485.5
All	5.7	1.1	2.9	3.0	6.8	1.4	0.2	78.9	100.0	1,599.3

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

<sup>1</sup> Includes module only enrolments, non-award and miscellaneous education courses and a small number enrolled in Degree courses. <sup>2</sup> Includes students without AQF-recognised post-school qualifications or for whom this information is unavailable.

Notes: (a) In 2003, Queensland introduced a unique student identifier for all students in the state covered by the collection. This resulted in a reduction in overall student numbers in 2003 compared to previous years. (b) NSW student numbers in the ACE sector in 2004 were affected by software incompatibility problems which resulted in a reduction in numbers, mainly in non-award courses, for that year. (c) Course information is about the major course enrolled in.

<sup>26</sup> Among those students with a previous higher education qualification, about a third was enrolled in non-award courses.

<sup>27</sup> Some students who complete courses at the same level as their previous qualification may, however, do so in a different field. For instance, some people working in, or retrenched from, declining industries may retrain in a different field but at the same level as their current qualification in order to seek employment opportunities in industries where there is a growing demand. However, as the focus of the analysis here is at the qualification level, those who change their field of education but not the level are not counted.

### 4.3 Patterns of reported VET course completions, 2001–05

As noted earlier, the scope of the available completions data is not exactly the same as that for enrolment. All measures of completions based on data from the *National VET Provider Collection* data are generally likely to underestimate the true number of VET course completions in Australia. Not only is the number of completions through non-publicly funded activity of private providers under reported but the extent of this under reporting is unknown.<sup>28</sup>

The focus of the analyses in this section is on the number of *people* aged 15–64 years who complete courses.<sup>29</sup> The actual number of *courses* being completed is likely to be larger as many students complete more than one course in a year. In the analysis, only the highest level course completed by a student is considered.

Although most of completions reported in a given year are for courses completed in the same year, some are for courses completed in earlier years. For instance, about 25,700 courses completed in 2004 and 1,800 completed in 2003 were only reported in 2005. This also means many courses completed in 2005 are yet to be reported. The reporting of courses completed in earlier years do, however, diminish substantially each year.

For this report, the number of courses completed in a given year is approximated by the total number of completions reported that year. Therefore, some of these completions will have been completed in previous years.<sup>30</sup>

#### 4.3.1 Reported VET course completions

Table 32 shows that 268,000 people aged 15–64 years completed a VET course in 2005.<sup>31</sup> Of all courses completed, 79.6 per cent were at a certificate II, III or IV.

The major changes in the qualifications completions profile from 2001 to 2005 were a five percentage point increase in completions at certificate III and an eight percentage point decrease at certificate II. Completions of diploma and advanced diploma courses also increased but by lesser amounts.

**Table 32 Reported VET course completions, Australia, 2001–05**

Highest level course completed	'000					%				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
Adv diploma	6.6	7.6	8.2	8.4	8.9	2.7	3.0	3.1	3.2	3.3
Diploma	24.7	28.4	29.4	28.2	28.4	10.2	11.1	11.2	10.7	10.6
Certificate IV	44.3	47.0	52.8	50.0	52.5	18.3	18.3	20.1	19.0	19.6
Certificate III	80.7	86.6	93.5	100.5	103.4	33.3	33.7	35.5	38.3	38.6
Certificate II	71.7	69.5	63.9	60.4	57.3	29.6	27.1	24.3	23.0	21.4
Certificate I	14.6	17.8	15.2	15.0	17.1	6.0	6.9	5.8	5.7	6.4
All	242.4	256.9	263.1	262.4	267.7	100.0	100.0	100.0	100.0	100.0

Source: Unpublished NCVER data. Scope: persons aged 15–64 years.

<sup>28</sup> Queensland submits data to NCVER early in the calendar year to meet its audit program timetable. After this data have been submitted to NCVER, completions relating to the reporting period are still received by the central data clearinghouse. Currently this late data are not included in the national submission for the following calendar year, as is the practice in other states. The analyses in this chapter are solely based on data submitted to NCVER. In chapter 5, a correction is made for incomplete data for Queensland.

<sup>29</sup> NCVER normally reports the number of courses being completed.

<sup>30</sup> It is not possible to precisely assess the size of the errors in using this approximation because the true number of course completions in any given year is unknown. For any given year, an indication of the error can be gauged by comparing the number with the aggregate of completions in that year as reported each year. For example, the total number of completions reported in 2002 was 282,000, but by 2005 291,800 completions had been reported for 2002.

<sup>31</sup> The total number of *courses* completed by this cohort in the same year was 287,000.

Table 33 shows that overall the number of completions increased 10.4 per cent from 2001 to 2005. However, year-on-year changes varied, with a six per cent jump in completions from 2001 to 2002 and a small decline from 2003 to 2004. Improved reporting procedures may have contributed to some improvements in completion numbers, although the reason for the decline from 2003 to 2004 is not clear.

Course completions increased at the fastest rate at the advanced diploma level but this was from a relatively small base. Certificate II completions declined 20.1 per cent from 2001 to 2005.

**Table 33 Annual changes in reported VET course completions, Australia, 2001–05**

Highest level course completed	Annual change (%)					Average	Total change 2001 to 2005 (%)
	2001 to 2002	2002 to 2003	2003 to 2004	2004 to 2005			
Adv diploma	15.9	8.0	2.1	6.7	8.2	36.3	
Diploma	15.3	3.5	-4.3	1.0	3.9	15.4	
Certificate IV	6.2	12.4	-5.3	5.1	4.6	18.7	
Certificate III	7.3	8.0	7.5	2.9	6.4	28.2	
Certificate II	-3.0	-8.1	-5.4	-5.2	-5.4	-20.1	
Certificate I	22.1	-14.6	-1.8	14.5	5.0	17.2	
All	6.0	2.4	-0.3	2.0	2.5	10.4	

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

#### 4.3.2 Reported VET course completions by gender of student

Table 34 shows that more females (54.4 per cent) than males (45.6 per cent) completed VET courses in 2005, although females comprised only 48 per cent of enrolments (see Table 27). Only at certificate I level were there more course completions by males.

From 2001 to 2005, course completions by females generally increased at a higher rate than by males. In particular, female completions of diploma and certificate IV courses increased at a much faster rate than male completions. However, male completions of certificate I courses increased at a higher average rate, despite the total for males in 2005 being fairly similar to that for females.

**Table 34 Reported VET course completions by sex of student, Australia, 2001–05**

Highest level course completed	Males				Females			
	2005		Change 2001–05		2005		Change 2001–05	
	'000	%	Average annual (%)	Total (%)	'000	%	Average annual (%)	Total (%)
Adv diploma	4.4	3.6	7.9	34.8	4.6	3.1	8.6	38.2
Diploma	12.3	10.1	2.6	9.5	16.1	11.0	4.9	20.2
Certificate IV	21.9	17.9	2.3	8.9	30.6	21.0	6.3	26.8
Certificate III	48.2	39.5	6.2	26.8	55.2	37.9	6.7	29.4
Certificate II	25.9	21.2	-5.8	-21.3	31.4	21.5	-5.1	-19.0
Certificate I	9.2	7.6	6.2	24.6	7.9	5.4	4.0	9.6
All	122.0	100.0	1.9	8.0	145.7	100.0	3.1	12.6

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

#### 4.3.3 Reported VET course completions by age of student

Table 35 shows that 23.5 per cent of all students who completed VET courses in 2005 were aged 15–24, 59.8 per cent 25–44 and 16.8 per cent 45–64. Fewer older people completed courses relative to the numbers enrolled. This could be related to a higher need by older workers to fill specific skill gaps and the need to upgrade skills which do not require completing whole qualifications. The average growth rate in completions from 2001 to 2005 was lowest among the 25–44 years group. Nearly half of all course completions by people aged 15–24 years in 2005 were at certificates I or II. The proportion completing courses at these levels among the other two age groups was

substantially lower. Course completions by people aged 15–24 years increased most at the lowest and highest qualification levels.

Relative to the other two age groups, a higher proportion of completions by people aged 25–44 years in 2005 were at the diploma or advanced diploma levels. This associated with career advancement among this age group and their need for higher earnings to meet increased financial responsibilities. Many of them may already have a lower level qualification.

**Table 35** Reported course completions by age of student, Australia, 2001–05

Highest level course completed	15–24 years				25–44 years				45–64 years			
	2005		Change 2001–05		2005		Change 2001–05		2005		Change 2001–05	
	'000	%	Average annual (%)	Total (%)	'000	%	Average annual (%)	Total (%)	'000	%	Average annual (%)	Total (%)
Adv diploma	1.3	2.1	22.5	118.0	6.8	4.2	6.4	27.7	0.8	1.9	6.9	29.2
Diploma	4.7	7.4	4.6	18.6	20.0	12.5	3.4	12.8	3.8	8.5	5.9	25.6
Certificate IV	5.8	9.3	6.9	30.1	34.1	21.3	3.9	16.0	12.6	28.1	5.6	21.3
Certificate III	20.3	32.3	5.4	23.2	66.3	41.4	5.8	25.1	16.8	37.5	10.8	50.0
Certificate II	23.6	37.6	1.3	4.9	25.8	16.1	-10.0	-34.5	7.8	17.4	-5.1	-19.4
Certificate I	7.1	11.2	11.1	48.9	7.1	4.4	0.9	-2.2	3.0	6.6	4.7	13.8
All	62.8	100.0	4.5	19.0	160.0	100.0	1.3	5.2	44.9	100.0	4.6	19.4

Source: Unpublished NCVER data. Scope: persons aged 15–64 years.

#### 4.3.4 Reported course completions by training package

Table 36 shows training packages with 3,000 or more course completions in 2005. Four out of every five completions were in just 20 packages and almost 50 per cent in five. Most packages listed in Table 29 above are also listed here. However, the package rankings differ in the two tables. For example, the metal and engineering industry package is ranked fifth in terms of enrolments but tenth in terms of completions.

Several training packages with more than 10,000 enrolments (see Table 29 above) had less than 3,000 completions and therefore are not listed in Table 36. These packages include amenity horticulture, rural production, hairdressing and Australian meat industry. This indicates relatively low course completion rates in these packages.

Training packages with a high proportion of completions at the diploma/advanced diploma were financial services (37.3 per cent), tourism (31.3 per cent), business services (22 per cent) and information technology (20.3 per cent). The proportions of completions at certificate I/II were highest in retail (60.2 per cent), automotive industry retail, service and repair (54 per cent), information technology (46.7 per cent), hospitality (46 per cent) and food processing industry (40.8 per cent).

Although non-training package enrolments at advanced diploma and certificate I were higher than training package enrolments (see Table 29 above), the opposite was the case for course completions.

**Table 36** Reported completions of training package with 3,000 or more completions by qualification level, Australia, 2005 (%)

Training package (TP) with 3,000 or more completions	%							Total	
	Adv diploma	Diploma	Certificate IV	Certificate III	Certificate II	Certificate I	Total	'000	% of total TP completions
Business services	4.0	18.0	26.3	34.3	15.2	2.2	100.0	33.8	15.8
Community services	0.6	15.3	17.1	64.3	2.5	0.3	100.0	24.8	11.6
Hospitality	4.1	6.1	5.8	37.9	41.9	4.1	100.0	16.8	7.9
Retail	0.0	0.7	2.5	36.6	57.3	2.9	100.0	13.4	6.2
Assessment and wkplace training	0.0	1.6	98.4	0.0	0.0	0.0	100.0	13.2	6.2
Information technology	0.5	19.8	17.3	15.7	24.7	22.0	100.0	11.0	5.1
Transport and distribution	0.4	1.8	6.9	68.2	20.6	2.2	100.0	7.6	3.5
Auto indust retail, serv & repair	0.0	0.4	0.1	45.4	37.6	16.4	100.0	6.8	3.2
Financial services	19.0	18.3	18.6	43.7	0.3	0.0	100.0	6.7	3.1
Metal and engineering industry	0.0	1.4	3.7	60.0	23.5	11.6	100.0	5.6	2.6
General construction	0.2	0.2	0.0	85.5	4.8	9.4	100.0	5.2	2.4
Telecommunications	0.9	1.2	14.7	73.3	10.2	0.0	100.0	4.2	2.0
Tourism	6.2	25.1	10.6	44.6	13.5	0.3	100.0	3.9	1.8
Health	1.8	14.4	17.6	50.1	16.0	0.0	100.0	3.8	1.8
Electrotechnology industry	8.8	0.3	4.1	61.9	10.3	14.5	100.0	3.4	1.6
Food processing industry	0.0	0.0	0.3	59.2	26.7	14.1	100.0	3.3	1.6
Asset maintenance	0.0	0.0	1.6	76.8	21.3	0.0	100.0	3.2	1.5
Asset security	0.0	1.0	1.6	65.3	29.9	1.9	100.0	3.1	1.5
TP with <3,000 completions	1.4	9.2	18.1	38.8	28.5	4.3	100.0	44.2	20.7
All TP completions	2.3	9.6	19.3	43.0	21.4	4.5	100.0	214.0	100.0
Non-TP completions	7.7	14.8	20.8	21.4	21.3	13.9	100.0	53.7	
All completions	3.3	10.6	19.6	38.6	21.4	6.4	100.0	267.7	
All TP completions ('000)	4.8	20.5	41.3	91.9	45.8	9.7	214.0		
Non-TP completions ('000)	4.1	7.9	11.2	11.5	11.5	7.5	53.7		
All completions ('000)	8.9	28.4	52.5	103.4	57.3	17.1	267.7		

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

#### 4.3.5 Overseas student reported VET course completions

Course completions by overseas students are a small proportion of all completions. Table 37 shows the average number of overseas students who completed VET courses from 2001 to 2005 was 6,500. Overseas students were more likely to complete higher level courses than Australian students. In 2005, 48.3 per cent of courses completed by overseas students were at the diploma/advanced diploma level, which is much higher than the 13.9 per cent for all students (see Table 32 above). The 2,300 diplomas completed by overseas students in 2005 represent eight per cent of the total of 28,400 completions at this level in Australia (see Table 32 above).

**Table 37** Reported course completions by overseas students, Australia, 2001–05

Highest level course completed	'000					%				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
Adv diploma	0.7	0.9	0.9	0.7	1.1	12.8	13.2	12.9	11.5	15.4
Diploma	2.2	3.0	2.5	2.0	2.3	38.5	42.5	38.0	32.7	32.9
Certificate IV	1.0	1.0	1.2	1.2	1.1	16.9	14.7	17.9	20.1	16.2
Certificate III	1.1	1.3	1.5	1.6	1.8	19.7	18.5	22.6	25.9	24.9
Certificate II	0.5	0.6	0.5	0.4	0.5	9.3	8.7	7.3	6.8	6.7
Certificate I	0.2	0.2	0.1	0.2	0.3	2.9	2.4	1.2	2.9	3.8
All	5.8	7.0	6.6	6.2	7.0	100.0	100.0	100.0	100.0	100.0

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

### 4.3.6 Previous highest qualification of students completing VET courses

Many students complete VET courses at the same or lower level than of their previously completed highest qualification.

Table 38 shows that of the total number of students who completed a course in 2005, 72,100 had a previous qualification of which 53,000 were at a higher or same level as that of the qualification completed (see shaded cells in Table 38).

A relatively large number of people completing certificate IV had a previous qualification at a higher education level. Some of these are likely to be VET professionals with higher education qualifications completing certificate IV in assessment and workplace training.

**Table 38 Previous highest qualifications of persons by qualification of reported course completed, Australia, 2005 (%)**

Highest level course completed	Previous highest qualification attained								Total	
	Higher education	Adv diploma	Diploma	Certificate IV	Certificate III	Certificate II	Certificate I	Others <sup>1</sup>	%	'000
Adv diploma	7.9	4.5	11.2	9.0	4.5	0.0	0.0	65.2	100.0	8.9
Diploma	7.0	2.1	7.4	13.4	9.2	0.4	0.0	60.9	100.0	28.4
Certificate IV	13.1	2.1	5.5	8.0	12.4	0.8	0.0	57.9	100.0	52.5
Certificate III	4.4	1.0	2.6	2.0	9.1	3.0	0.1	77.8	100.0	103.4
Certificate II	4.4	0.9	2.1	1.6	5.2	3.3	0.3	82.2	100.0	57.3
Certificate I	5.3	1.2	2.3	1.2	2.9	1.2	1.2	86.0	100.0	17.1
All	6.6	1.3	3.8	4.5	8.4	2.1	0.2	73.1	100.0	267.7

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

<sup>1</sup> Category includes students without post-school AQF-level qualifications or for whom this information is unavailable.

### 4.3.7 Net completions of VET courses

Students completing courses that are at the same or lower level than their previously completed highest qualification do not affect the qualifications profile of Australia’s workforce. Therefore in terms of meeting requirements under Scenario II in section 3.3 above, these completions must be discounted.

In this report, *net completion* is defined as a course completion that makes a difference to the current qualifications profile of Australia’s population. Table 39 shows net completions in 2005 with overseas students included and also when they are excluded. It shows net completions of 214,700 in 2005.<sup>32</sup> Excluding overseas students, net completions were 208,700.

**Table 39 Net course completions by qualification level, Australia, 2005 ('000)**

Qualification	Including overseas students			Excluding overseas students		
	All completions	Completions at same or lower level than previously attained qualification	Net completions	All completions	Completions that same or lower level than previously attained qualification	Net completions
Adv diploma	8.9	1.0	7.9	7.9	0.9	6.9
Diploma	28.4	4.7	23.8	26.1	4.3	21.8
Certificate IV	52.5	15.1	37.4	51.4	14.9	36.5
Certificate III	103.4	19.8	83.6	101.7	19.4	82.2
Certificate II	57.3	10.0	47.3	56.8	10.0	46.9
Certificate I	17.1	2.5	14.7	16.9	2.5	14.4
All	267.7	53.0	214.7	260.7	52.0	208.7

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

<sup>32</sup> If correction is made for the late reporting of completions in Queensland and some advanced diploma and diploma completions in the higher education sector, total completions are estimated to be 284,400, and net completions 229,200.

## 4.4 Other sources of supply

The publicly funded VET sector does not constitute the total supply of people with VET qualifications in Australia, although it is the major source. However, in assessing total supply the following points should be noted.

People obtaining VET qualifications through private providers when no public subsidy is involved may not be captured in the *National VET Provider Collection*. As noted in section 4.1 above, while some private providers do provide data on completions in some jurisdictions, it is not clear what gets reported. In the past few years attempts have been made to estimate the extent of VET activity through private RTOs (Roussel and Murphy 2000; Hall Chadwick 2003; William Buck 2005).

The most recent study, Harris, Simons and McCarthy (2006), estimates 2.2 million students (1.7 million part-time and 0.5 million full-time) enrolled in VET with 'private'<sup>33</sup> RTOs in 2003, including 290,000 part-time students with just one RTO. In comparison, the number of student enrolments reported in the *National VET Provider Collection* was 1.67 million in the same year. As acknowledged by the authors, the non-response rate to the survey was high and the sample of RTOs responding was not representative of the population. For example, adult and community education and enterprise-based providers were over-represented compared to other types. Population estimates based on a non-representative sample can lead to biased estimates. More importantly, in voluntary surveys like this it is usually the larger and better organised RTOs which are likely to have responded and provided accurate data on student enrolments and completions, which mean the population estimates are likely to be upwardly biased. Therefore, it is difficult to be confident about the accuracy of the estimates of student enrolments provided in this study. Furthermore, although some data on qualification completions were gathered in the survey, population estimates are not provided. As data on previous qualifications are also lacking, it would be impossible to assess net completions based on this survey. Finally, the survey provides no information on the hours of training involved, and it is known that some of the enrolments are for very short courses.

Accurate assessment of net completion of qualifications and the total training effort resulting from private RTO activities will not be resolved until the development of a statistical standard for private provision.

VET qualifications (usually at certificate I and II levels) completed by school students, where the courses were delivered by schools, are additional sources not included in the *National VET Provider Collection*.

People completing diploma/advanced diploma or associate degree qualifications in the higher education sector<sup>34</sup> or other specialist institutions (eg. police academies) are also additional sources not included in the *National VET Provider Collection*.

Some overseas students apply onshore for permanent residency on completing their VET course and therefore can be a source of additional labour supply. Although data on overseas students in TAFE are available, it is difficult to estimate the proportion applying for and being granted residency visas or work permits after graduation. Furthermore, anecdotal evidence suggests some overseas students have little intention to work in the area related to their qualification. The completion of the VET course to them is just a means of accumulating additional points to improve the chances of a successful onshore permanent skilled migration visa application.

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<sup>33</sup> In the study, organisations listed on the *National Training Information Service* and registered to provide nationally accredited VET, excluding TAFE, universities and schools, were considered 'private' RTOs. Thus adult and community providers which may be largely publicly funded are considered private RTOs.

<sup>34</sup> In 2004, the number of domestic students who completed an associate degree, advanced diploma or diploma in a higher education institution was 3,311 (DEST 2006 unpublished). In the following chapter supply is adjusted to include completions from the higher education sector.

People with VET qualifications migrating to Australia net of people leaving are also a source of additional supply. Net permanent and temporary migration adds skilled labour to Australia each year, although the extent of this by qualification is difficult to assess.<sup>35</sup>

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## 4.5 Summary

This chapter has provided a description of the current patterns of enrolment and completions of VET courses by student and course characteristics. The analyses provide an indication of the potential supply of workers with VET qualifications for the Australian labour force. The assessment is based on data from the *National VET Provider Collection*, which does not include all VET graduates from private providers, schools, most universities or specialist academies.

Students completing courses at the same or lower level than of their previous highest qualification do not affect the qualifications profile of Australia's workforce. Therefore, in terms of meeting requirements for qualified people, these completions must be excluded. The remainder are referred to as net completions.

Patterns of student enrolment in VET courses from 2001 to 2005 were as follows:

- An average of 1.62 million students enrolled in VET courses each year. The average number enrolled in courses which lead to the award of a qualification was about 1.12 million and in courses such as module only and non-award courses it was about half a million. However, the trend in enrolments shows a small decline of 0.5 per cent per year from 2001 to 2005, largely due to declining enrolments in non-award courses.
- Just over half the students enrolled in VET courses were male. Male enrolments were higher at certificate III while female enrolments were higher at the diploma and certificate IV levels.
- A higher proportion of people enrolled in award courses were aged 15–24 years than 45–64 years. The proportion was significantly higher at certificates I-III.
- Enrolment of overseas students in VET courses averaged about 21,000 per year, with increasing numbers enrolling in diploma and certificate III level courses. Compared to overseas student enrolments in higher education, the numbers in VET are still relatively small.
- The number of training packages available increased from 62 to 81. Over 854,000 students were enrolled in packages in 2005. Most packages, however, had relatively few student enrolments, with just 20 packages accounting for over 80 per cent of enrolments. A third of all enrolments were in business services, community services and hospitality. A majority of enrolments at the advanced diploma level in 2005 were not in training packages. At the diploma level a third of enrolments were outside packages. This indicates the development of training packages has been slow in terms of incorporating higher level courses. In contrast, most certificate II-IV courses were undertaken via packages.

More than one in every five students enrolling in a VET course in 2005 had previously attained an AQF-level qualification, with half of them at the same or higher level than of the course currently being undertaken.

From 2001 to 2005, patterns of student completion of VET courses were as follows:

- Course completions increased at all levels except certificate II. In particular, advanced diploma completions increased at a substantial rate, albeit from a relatively small base. The total number of completions increased 10.4 per cent to 268,000 in 2005.

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<sup>35</sup> Shah and Burke (2005) estimated a net inflow of about 4,400 associate professionals and 8,600 tradespersons to Australia in 2003-04.

- Female course completions increased 3.1 per cent per year while male completions increased at a much lower rate of 1.9 per cent. Despite lower total enrolments, more females than males completed VET courses in 2005.
- Course completions by people aged 25–44 years increased at the lowest rate for any age group. However, the proportion of completions at the diploma and advanced diploma levels were the highest among this age group in 2005. Nearly half of all course completions by people aged 15–24 years in 2005 were at certificates I/II.
- Only 11.8 per cent of training package completions were at the diploma/advanced diploma level. Training packages with a high proportion of diploma/advanced diploma completions were financial services (37.3 per cent), tourism (31.3 per cent), business services (22 per cent) and information technology (20.3 per cent). Almost all completions in the assessment and workplace training package were at certificate IV level.
- VET course completions by overseas students averaged only 6,500 per year and tended to be at higher qualification levels compared to domestic students.

More than 72,000 students who completed a course in 2005 had a previous AQF-level qualification, 53,000 at a level higher than, or the same as, the course completed. This means that net completions in 2005 were 214,700. Excluding overseas students, net completions were 208,700.

## 5 Shortfall in VET qualifications

Chapter 3 provided estimates of the number of people with qualifications required in Australia from 2006 to 2016 to realise the qualifications profile of the employed workforce in 2016 under Scenario II. It included estimates of the number of new entrants with qualifications to occupations and of the number of existing workers who will need to gain, or upgrade, qualifications.

Chapter 4 included analyses of recent trends in the enrolment and completion of publicly funded VET courses.

This chapter provides an analysis of the gap between supply and requirements for people with VET qualifications from 2006 to 2016. It assumes requirements as estimated in chapter 3. The pattern of supply in this period is assumed to be at the same level as observed for 2005 (see chapter 4).

Overseas students are excluded from the analysis and the completions reported in Table 39 above are adjusted for some late reporting in Queensland and for the small number of diplomas and advanced diplomas awarded annually in the higher education sector. The gap between supply and requirements is also assessed in terms of nominal student contact hours.

### 5.1 Shortfall in the number of persons with VET qualifications

Table 40 shows that at current levels of supply, a shortfall in requirements of 240,000 people with VET qualifications can be expected in the ten years to 2016. However, shortfalls are not expected at every qualification level. While shortfalls are expected at the advanced diploma, diploma and certificate III levels, surpluses are expected at all other levels. Therefore, to meet the target for the qualifications profile of the employed in 2016, both the *quantity* and *distribution* of supply will need adjusting over the next ten years.

The requirements can be met if net completions from the VET sector increase an average 1.9 per cent per year and those from the higher education sector remain constant over the next ten years. However, the growth rate in net completions needs to be much greater than this at the diploma and advanced diploma levels. A modest growth rate in net completions is also required at certificate III. At all other levels, oversupply will result if the 2005 rate of net completions continues. In summary, to meet requirements, not only does the *level of supply* of qualifications need to increase but its *distribution across levels* also needs to change.

**Table 40 Shortfall in VET qualifications, number of persons, Australia, 2006–16**

Qualification level	Number of persons with qualifications 2006–16 ('000)			Annual % change in net completions to meet requirements
	Requirements to meet target for qualifications profile of people in employment in 2016 as under Scenario II	Expected net completions <sup>a</sup>	Expected surplus (+) / shortfall (-)	
Adv diploma	346	84	-262	27.2
Diploma	536	253	-283	14.1
Certificate IV	310	344	34	-1.9
Certificate III	911	799	-112	2.4
Certificate II	259	566	307	-14.9
Certificate I	111	186	75	-9.7
<b>Total</b>	<b>2,473</b>	<b>2,233</b>	<b>-240</b>	<b>1.9</b>

<sup>a</sup>The net completion figures in this table have been adjusted to reflect underreporting to NCVER by Queensland and advanced diploma and diploma completions in the higher education sector. Calculations of annual increase assume the supply from the higher education will remain constant at the 2004 level.

Scope: 15–64 years, excluding overseas students.

## 5.2 Shortfall in publicly funded student contact hours

Based on delivery and outcomes in 2005, Table 41 shows some 'efficiency' measures for the VET sector. Every 5.9 enrolments generally resulted in one net completion. However, the ratio was much higher at certificate I. Nominal student contact hours required per net completion were 1,333 but this number varied substantially depending on the level of the course. Higher level courses take longer to complete and are therefore allocated more hours per student. The average student contact hours per net completion ranged from 840 at certificate II to 2,213 at advanced diploma. The higher average for certificate I than certificate II reflects the lower completion rate at this level.

The low number of completions relative to enrolments are not surprising as many people enrol in VET courses to access specific modules of competencies without intending to complete a whole course at the time of first enrolment, although they may return to complete the course later (Foyster, Hon and Shah 2000).<sup>36</sup>

**Table 41 Student contact hours and course enrolments, completions and net completions, Australia, 2005**

	Delivery and outcomes in 2005						
	Adv Dip	Dip	Cert IV	Cert III	Cert II	Cert I	Total
Total student contact hours (million)	15.7	48.3	51.4	110.7	47.6	19.8	293.3
Total course enrolments ('000)	40	137	202	485	296	140	1,299
Total net completions <sup>a</sup> ('000)	7.1	23.3	34.4	79.9	56.6	18.6	220.0
Student contact hours per net completion	2,213	2,068	1,492	1,386	840	1,060	1,333
Student contact hours per enrolment	396	352	255	228	161	141	226
Course enrolments per net completion	5.6	5.9	5.9	6.1	5.2	7.5	5.9

<sup>a</sup>The net completion figures in this table have been adjusted to reflect underreporting to NCVET by Queensland but excludes the small number of advanced diploma and diploma completions from the higher education sector.

Note: All data relate to 15–64 year-olds excluding overseas students.

Table 42 shows the expected shortfall/surplus in student contact hours to meet requirements for VET qualifications from 2006 to 2016. The calculations in this table use the ratios of student contact hour per net completion given in Table 41.

Shortfalls in student contact hours are expected at advanced diploma (580 million), diploma (585 million) and certificate III (155 million). These shortfalls are offset to a certain extent by surpluses at other levels, resulting in a net total shortfall of 931 million student contact hours. Less expansion would be required if completion rates and methods of recognising prior learning improve.

The annual percentage change in student contact hours required at each qualification level from 2006 to 2016 will be the same as that indicated in the last column in Table 40. This is because the number of student contact hours per net completion is constant for each qualification level.

The expansion is, however, largely at the longer diploma and advanced diploma courses. The average student contact hours per net completion at these levels is over 2000 hours. In contrast, the contraction is at certificates I and II where only around 1000 student contact hours are required per net completion. Therefore, the annual growth rate in aggregate student contact hours required will be greater than the 1.9 per cent growth rate in net completions shown in Table 40. The required growth rate in aggregate student contact hours is estimated at five per cent per year. As discussed earlier, improvements in course completion rates and improved system of recognising prior learning can also reduce the required number of student contact hours.

<sup>36</sup> Some students who only wish to access specific modules of competencies are recorded as such, and are excluded from the analyses in this report, but some enrol in courses and are included. Some of those who do not complete qualifications at the time of their first enrolment may return to study, and if granted recognition for units completed, require fewer resources to complete the qualification.

**Table 42 Shortfall in VET qualifications, student contact hours of training, Australia, 2006–16**

Qualification level	Student contact hours 2006–16 (million)		
	Requirements to meet target for qualifications profile of people in employment in 2016 as under Scenario II <sup>a</sup>	Delivery at 2005 rate	Expected surplus (+) / shortfall (-)
Adv diploma	736	157	-580
Diploma	1,068	483	-585
Certificate IV	462	514	51
Certificate III	1,262	1,107	-155
Certificate II	218	476	258
Certificate I	118	198	80
<b>Total</b>	<b>3,864</b>	<b>2,933</b>	<b>-931</b>

Note: All data relate to 15–64 year-olds excluding overseas students.

<sup>a</sup>In the calculations of requirements, only net completions from publicly-funded VET sector are used because net completions from the higher education sector are not funded through the VET sector. Net completions resulting from fee-for-service activity in TAFE are however included.

## 6 Concluding remarks

This report has provided:

1. a projection of the qualifications profile of people in employment in Australia in 2016;
2. estimates of the additional number of qualified people required to attain the 2016 qualifications profile;
3. estimates of the current supply of people with VET qualifications;
4. estimates of the shortfall in the number of people with VET qualifications from 2006 to 2016; and
5. estimates of the additional student contact hours required to meet the shortfall in the number of people with VET qualifications from 2006 to 2016.

The derivation of the qualifications profile of the employed workforce in 2016 considered forecasts of employment growth by occupation as well as skills deepening in occupations. To attain this profile, the number of new entrants with qualifications to occupations (2.47 million) and the number of existing workers who will need to acquire qualifications (1.56 million) over the next decade were estimated.

At current levels of supply, the analyses suggest a shortfall in requirements for people with VET qualifications, especially those with higher level qualifications. On the other hand, oversupply can be expected at some lower qualification levels. Therefore future policy needs to address the dual problem of increasing the overall *level* of supply and its *distribution* towards higher qualification levels.

Net course completions need to increase at the rate of 1.9 per cent year from 2006 to 2016 to meet the target for the number of qualified people in employment in 2016. This could be met by expanding the hours of training provided at the rate of five per cent per year. Some expansion can be mitigated by improving course completion rates. People with partially completed qualifications could also be encouraged to finish their training with appropriate incentives, including recognition of prior learning. These people would require fewer contact hours than those enrolling in the same course for the first time.

The supply of VET qualifications from other sources, such as private RTOs, may also mitigate some expansion but it is not clear these sources make more than a marginal difference at the critical higher level qualifications. If employment increases more than projected in this report, for example through the improvement in the labour force participation rate, then training provision will need to exceed the estimates provided here.

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## Appendix 1 Labour supply and requirements in the trades

This appendix reports analyses of the supply of, and requirements for, people in trade occupations. Persons undertaking training for work in these occupations are usually under a contract of training, although this may not always be the case. Contracts of training are either a ‘traditional’ apprenticeship or a traineeship. In terms of supply, the main focus here will be on those undertaking traditional apprenticeships.

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### Data and scope of analysis

The analyses on current employment and future requirements for workers in the trades use the same data sources as those used in chapter 2 and chapter 3 of this report. However, for the analyses on supply, a different data source is used to that in chapter 4. This is because a major focus in this appendix is on ‘traditional trades’, the training for which generally involves a contract of training. NCVET defines a ‘traditional’ apprenticeship as being undertaken in one of the occupations in the tradespersons group (ASCO major group 4), at certificate III or higher level and with at least a two-year full-time or eight-year part-time contract. The apprenticeship can be school-based.<sup>37</sup>

Although the *National VET Provider Collection* (the data source used for analyses in chapter 4) includes a traditional apprentice flag to identify students undertaking traditional trade courses, in practice the flag has been found to be less than reliable. The *Apprentices and Trainees Collection* is derived from legal contracts of training entered into by apprentices with their employers and state or territory training authorities and as such is a more accurate record of these types of training. It will therefore be the primary source on future new supply in the trades reported in this appendix. Note that some training in the trades may be undertaken without a contract of training and as such estimates provided here may be lower than the total training undertaken for these occupations.

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### Employment 2001–05

Table A1 shows the number of people employed in the trades was 1.22 million in May 2005. The highest employment was in construction occupations. Overall, two thirds of people employed in the trades had qualifications. In mechanical and fabrication engineering, automotive and electrical and electronics the proportion with qualifications was nearly 75 per cent, while in food and skilled agriculture and horticulture it was 50 per cent or lower.

Table A1 shows employment in the trades increased 1.6 per cent per year from 2001 to 2005. In contrast, overall employment increased 2.1 per cent per year. Employment of people with qualifications increased at the same rate as of people without qualifications.

As Table A1 shows, the changes in employment were not uniform across all occupations. While employment in automotive and food declined, it increased by variable amounts in all other occupation groups. Despite high demand, especially for welders, boilermakers and other sheet metal workers in the buoyant resources sector, employment in mechanical and fabrication engineering trades generally remained stagnant because of the continual move offshore of jobs in manufacturing. As many food manufacturing jobs move offshore, jobs in the food trades will also continue to decline.

Sustained growth in the construction sector has resulted in high employment growth in the construction trades as well as in electrical and electronics occupations.

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<sup>37</sup> This definition may be inconsistent with legal definitions of apprentices that apply in some jurisdictions.

In some occupations employment of those without qualifications increased quite strongly. This suggests a tight labour market but also an increase in the employment of apprentices and trainees.

**Table A1 Employment changes in the trades, Australia, 2001–05**

Occupation	Employment May 2005 (‘000)				Average annual change 2001–05 (%)			Total change 2001–05 (%)		
	With quals	Without quals	All	% with quals in 2005	With quals	Without quals	All	With quals	Without quals	All
Mechanical & fabrication eng	156.1	52.7	208.8	74.7	-0.2	5.4	0.9	-1.1	18.0	3.1
Automotive	99.1	32.7	131.8	75.2	-0.5	-2.6	-1.1	-2.8	-10.5	-4.8
Electrical & electronics	139.2	49.6	188.8	73.7	2.8	6.6	3.5	8.2	23.7	11.9
Construction	208.0	113.2	321.2	64.8	3.1	3.8	3.3	13.1	15.2	13.8
Food	37.3	36.9	74.2	50.2	1.1	-5.2	-2.4	3.7	-20.5	-10.0
Skilled agriculture & hort.	37.3	40.2	77.5	48.1	0.5	2.9	1.5	-0.9	11.7	5.3
Other trades	147.5	74.7	222.1	66.4	3.6	0.2	2.3	14.9	0.3	9.5
All	824.4	399.9	1,224.3	67.3	1.6	1.6	1.6	6.5	6.3	6.4

Source: Unpublished ABS *Education and work surveys*, 2001–05 (ABS Cat. no. 6227.0). Scope: persons aged 15–64 years.

Table A2 shows employment is forecast to decline slightly in the trades from 2006 to 2016. However, in some occupations (mechanical and fabrication engineering, automotive and other trades) employment is forecast to increase. Forecasts of employment in construction and electrical and electronics occupations are affected by the expected downturn in the construction sector.

Skills deepening in the trades will result in a 4.8 percentage point increase to 72.5 per cent in the proportion with qualifications. It is expected to have the most impact in electrical and electronics and skilled agriculture and horticulture occupations. In automotive, the proportion with qualifications in 2016 is expected to be less than in 2006, the reason for which requires investigation of the relative changes in the qualifications profile in the automotive trade and trade occupations in general.<sup>38</sup>

**Table A2 Forecasts of employment in the trades, Australia, 2016**

Occupation	Employment 2006 (actual)				Employment 2016 (forecasts)			
	With quals (‘000)	Without quals (‘000)	All (‘000)	% with quals in 2006	With quals (‘000)	Without quals (‘000)	All (‘000)	% with quals in 2016
Mechanical & fabrication eng	162.2	53.9	216.1	75.0	173.2	60.0	233.2	74.3
Automotive	101.5	34.6	136.1	74.6	98.8	46.0	144.9	68.2
Electrical & electronics	142.6	47.6	190.2	75.0	150.2	21.9	172.2	87.3
Construction	222.8	118.6	341.4	65.3	203.0	107.9	310.9	65.3
Food	43.6	41.5	85.1	51.3	46.0	28.7	74.7	61.6
Skilled agriculture & hort.	47.6	47.4	95.0	50.1	61.2	32.9	94.1	65.1
Other trades	141.5	67.5	209.0	67.7	186.6	51.7	238.3	78.3
All	861.8	411.1	1,272.9	67.7	919.1	349.1	1,268.2	72.5

Table A3 shows that of the 919,000 people with qualifications employed in the trades in 2016, more than a third are expected to have acquired or upgraded their qualification in the preceding ten years. However, the proportion varies from 22.5 per cent in construction to 44.4 per cent in other trades. A low proportion could be a result of declining employment in that occupation or of already high numbers with qualifications in the occupation.

In chapter 4, it was shown that half of all employed Australians with qualifications in 2016 were expected to have acquired or upgraded them in the previous ten years. The reason for the lower proportion in the trades is partly due to the almost zero employment growth in these occupations.

<sup>38</sup> At each qualification level a single rate for skills deepening was applied to all occupations within each major occupation group.

Chapter 4 also showed the number of existing workers gaining or upgrading qualifications was relatively smaller than the number of new entrants. In the trades the opposite was true, which reflects the fact that much of the training in these occupations tends to be on-the-job. New entrants with qualifications to food and skilled agriculture and horticulture trades are a small proportion of the total numbers required with qualifications.

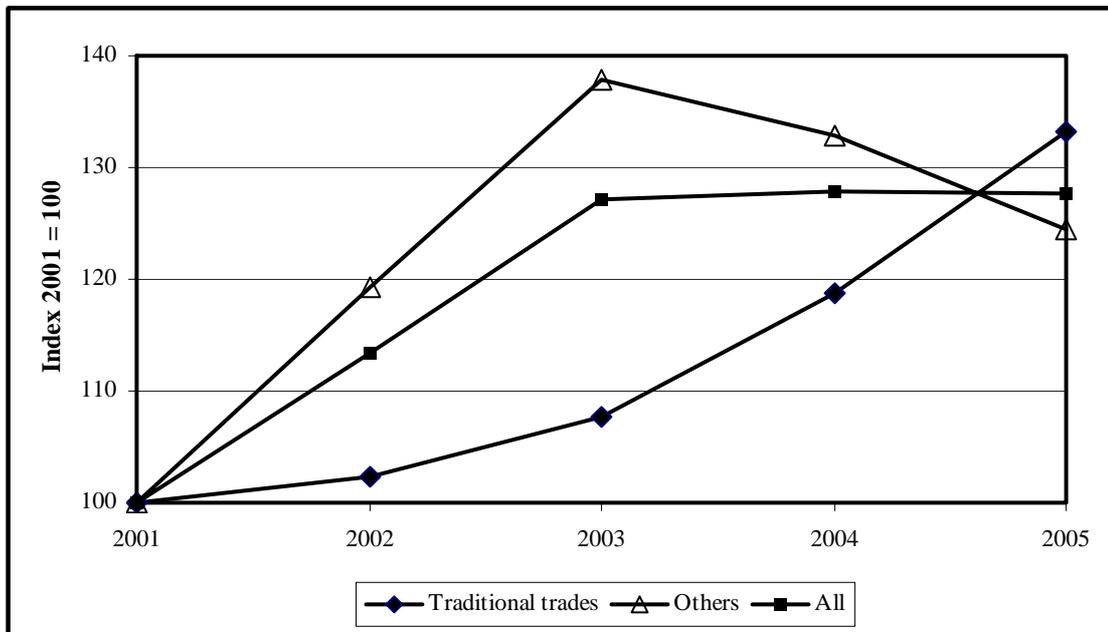
**Table A3 Scenario II: Qualifications required in the trades, Australia, 2006–16**

Occupation	Required number of persons with qualifications, 2006–16				
	With qualifications in 2016 ('000)	New entrants ('000)	Existing workers gaining or upgrading ('000)	Total '000	% of total with qualifications in 2016
Mechanical & fabrication engineering	173.2	29.7	26.6	56.3	32.5
Automotive	98.8	17.3	18.0	35.3	35.7
Electrical & electronics	150.2	19.5	32.1	51.6	34.3
Construction	203.0	17.6	28.0	45.6	22.5
Food	46.0	4.1	14.2	18.3	39.8
Skilled agriculture & horticulture	61.2	1.8	22.9	24.7	40.3
Other trades	186.6	36.0	46.9	82.8	44.4
All	919.1	125.9	188.7	314.5	34.2

**Apprentices in-training in the trades, 2001 to 2005**

The total number of people with contracts of training increased from 312,000 in 2001 to 398,000 in 2005. Figure A1 shows that until 2003 a major component of the growth in numbers in-training was of those *not* undertaking traditional trade apprenticeships. However, since then the numbers in this group have been declining. Traditional trade apprentices as a proportion of the total increased marginally from 35.2 to 36.8 per cent from 2001 to 2005, although the proportion dipped to 29.8 per cent in 2003.

**Figure A1 In-training numbers with contracts of training, 2001–05, Australia**



Source: Unpublished NCVER data. Scope: persons aged 15–64 years.  
 Note: Apprentice and trainee numbers in-training are reported each quarter. These are appropriately averaged to give in-training numbers for each calendar year.

By definition, all traditional trade apprenticeships are undertaken in trade occupations. However, as noted earlier, not all training undertaken in the trades is via this mode. Some training is undertaken as a 'traineeship' contract and others do not involve any contract of training. The following analysis is based on contracts of training only and therefore underestimates the total amount of training for these occupations. Although some data on traineeships are also included, the main focus of the analysis below is on traditional apprenticeships.

Table A4 shows that contracts of training in the trades rose at an increasing rate from 2001 to 2005. However, this growth was concentrated in traditional apprenticeships. As a proportion of all contracts, traineeship numbers declined to 13 per cent in 2005 from an average of 16 per cent in the previous four years.

Overall, traditional apprenticeships increased by a third to 146,600 from 2001 to 2005, with a 12.2 per cent increase in the last year.

From 2001 to 2005, apprenticeship numbers increased in all occupations except skilled agriculture and horticulture. They increased by half in construction and electrical and electronics trades.

Almost all apprenticeships in the trades were undertaken at certificate III level, but in 2005 about 1,700 were undertaken at certificate IV (most in mechanical and fabrication engineering).

Extremely few apprenticeships in the trades were undertaken on a part-time basis.

**Table A4 Apprentices in-training in the trades, 2001–05, Australia**

Occupation	Persons ('000)					% change 2001 to 2005	
	2001	2002	2003	2004	2005	Average annual	Total
Mechanical & fabrication eng	14.49	14.31	15.41	17.32	20	8.6	38.0
Automotive	20.08	20.29	20.79	21.99	23.9	4.5	19.0
Electrical & electronics	15.75	16.14	17.29	19.73	23.32	10.5	48.1
Construction	26.6	28.18	30.93	35.75	40.48	11.1	52.2
Food	12.73	12.83	13.09	13.85	15.55	5.2	22.2
Skilled agriculture & horticulture	4.29	4.4	4.07	4.05	4.17	-0.6	-2.8
Other trades	16.07	16.49	16.94	18.04	19.17	4.5	19.3
Apprenticeships	110.0	112.6	118.5	130.7	146.6	7.5	33.3
Traineeships	20.82	22.11	23.71	25.16	22.85	2.6	9.8
All contracted training	130.83	134.75	142.23	155.88	169.46	6.7	29.5

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

Note: Apprentice and trainee numbers in-training are reported each quarter. These are appropriately averaged to give in-training numbers for each calendar year.

As Table A5 shows, most apprentices in-training in 2005 were male. Although a majority of trainees were also male, the proportion in this case was somewhat smaller. However, in some occupations the proportion of females was quite high. In 'other' trades, which include hairdressers, more than half of all apprentices were female, and females made up nearly a quarter of the total in food occupations.

**Table A5 Apprentices in-training in the trades in 2005 by sex, Australia (%)**

Occupation	Male	Female	All	
			%	'000
Mechanical & fabrication eng	97.9	2.2	100	20.0
Automotive	98.5	1.5	100	23.9
Electrical & electronics	98.6	1.4	100	23.3
Construction	99.0	1.0	100	40.5
Food	75.5	24.6	100	15.6
Skilled agriculture & horticulture	89.7	10.6	100	4.2
Other trades	48.3	51.7	100	19.2
Apprenticeships	89.3	10.7	100	146.6
Traineeships	76.4	23.6	100	22.9
All contracted training	87.5	12.5	100	169.5

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

Note: Apprentice and trainee numbers in-training are reported each quarter. These are appropriately averaged to give in-training numbers for each calendar year.

Table A6 shows the age distribution of apprentices in-training in the trades in 2005. It shows that while 85.8 per cent of apprentices were aged 15–24 years, the proportion of trainees in this age group was only 66.3 per cent. In all occupations, less than one in every five apprentices was aged 25–44 years. Only 1.2 per cent of all apprentices were aged 45–64 years, but the proportion of trainees in this age group was much higher.

**Table A6 Apprentices in-training in the trades in 2005 by age, Australia (%)**

Occupation	15–24 years	25–44 years	45–64 years	All	
				%	'000
Mechanical & fabrication eng	80.2	17.3	2.6	100	20.0
Automotive	91.7	8.0	0.3	100	23.9
Electrical & electronics	82.0	17.1	0.9	100	23.3
Construction	88.0	11.6	0.4	100	40.5
Food	83.6	14.0	2.4	100	15.6
Skilled agriculture & horticulture	76.3	19.4	4.3	100	4.2
Other trades	88.1	10.5	1.4	100	19.2
Apprenticeships	85.8	13.0	1.2	100	146.6
Traineeships	66.3	26.8	6.9	100	22.9
All contracted training	83.2	14.9	2.0	100	169.5

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

Note: Apprentice and trainee numbers in-training are reported each quarter. These are appropriately averaged to give in-training numbers for each calendar year.

Table A7 shows that compared to students undertaking general VET courses, apprentices in the trades were less likely to have a previous non-school qualification. Less than 15 per cent had a previous qualification, most of which were certificates I or II. A higher proportion (23.4 per cent) of trainees had previous a qualification, with 10 per cent at certificate III or a higher level.

**Table A7 Apprentices in-training in the trades in 2005 by previous highest qualification attained, Australia (%)**

Occupation	Previous highest qualification attained				All	
	Diploma or higher	Certificate III	Certificate I or II	Others	%	'000
Mechanical & fabrication eng	1.6	3.2	13.1	82.2	100	20.0
Automotive	0.8	1.8	12.8	84.6	100	23.9
Electrical & electronics	2.8	5.0	9.1	83.1	100	23.3
Construction	1.1	2.2	8.8	87.8	100	40.5
Food	1.9	3.5	16.6	78.1	100	15.6
Skilled agriculture & horticulture	1.4	4.3	14.9	79.6	100	4.2
Other trades	1.7	2.9	10.4	85.0	100	19.2
Apprenticeships	1.6	3.0	11.3	84.2	100	146.6
Traineeships	2.4	7.4	13.6	76.6	100	22.9
All contracted training	1.7	3.6	11.6	83.1	100	169.5

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

Note: Apprentice and trainee numbers in-training are reported each quarter. These are appropriately averaged to give in-training numbers for each calendar year.

Table A8 shows the number of ‘existing workers’<sup>39</sup> among apprentices in-training in the trades was relatively small compared to trainees. The proportion of apprentices who were existing workers was higher in mechanical and fabrication engineering and skilled agriculture and horticulture occupations than in other occupations.

<sup>39</sup> An existing worker is defined as a person who has been employed by the employer, who is party to the training contract, continuously for more than three months full-time or twelve months casual or part-time or a combination of both, immediately prior to commencement of the training contract.

**Table A8 Apprentices in-training in the trades in 2005 by existing worker status, Australia (%)**

Occupation	Existing workers	Others	All	
			%	'000
Mechanical & fabrication engineering	14.2	85.8	100	20.0
Automotive	6.5	93.5	100	23.9
Electrical & electronics	6.0	94.0	100	23.3
Construction	3.8	96.2	100	40.5
Food	9.6	90.4	100	15.6
Skilled agriculture & horticulture	12.7	87.3	100	4.2
Other trades	7.6	92.4	100	19.2
Apprenticeships	7.4	92.6	100	146.6
Traineeships	18.7	81.3	100	22.9
All contracted training	8.9	91.1	100	169.5

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

Note: Apprentice and trainee numbers in-training are reported each quarter. These are appropriately averaged to give in-training numbers for each calendar year.

### Apprenticeship commencements in the trades, 2001 to 2005

Table A9 shows that from 2001 to 2005, apprenticeship commencements increased by two thirds. Trainee numbers, after increasing in the first four years, declined sharply in 2005.<sup>40</sup>

Increases in apprenticeship commencements varied across trades, with particularly large increases reported in mechanical and fabrication engineering, electrical and electronics and construction. These increases were related to the robust demand from the construction and resources sectors in recent years.

**Table A9 Apprenticeship commencements in the trades, 2001–05, Australia**

Occupation	Persons ('000)					% change 2001 to 2005	
	2001	2002	2003	2004	2005	Average annual	Total
Mechanical & fabrication eng	4.4	5.2	5.8	6.8	8.3	17.1	87.6
Automotive	6.3	6.6	7.3	8.5	9.2	10.1	46.5
Electrical & electronics	4.7	5.3	6.2	8.1	9.4	19.1	100.2
Construction	8.2	11.0	12.8	15.0	15.7	18.2	92.0
Food	5.4	5.4	5.8	6.6	7.7	9.5	42.8
Skilled agriculture & horticulture	1.9	1.8	1.6	2.0	2.2	5.4	18.8
Other trades	5.5	5.8	6.3	7.2	7.9	9.5	43.3
Apprenticeships	36.3	41.0	45.8	54.1	60.4	13.6	66.3
Traineeships	13.0	13.8	15.7	16.9	12.9	0.9	-1.2
All contracted training	49.3	54.8	61.5	71.0	73.2	10.5	48.5

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

Note: Apprentice and trainee commencements are reported each quarter. These are appropriately aggregated to give commencements for each calendar year.

### Apprenticeship completions in the trades, 2001 to 2005

Table A10 shows the number of apprenticeship completions from 2001 to 2005. Completions of apprenticeships in the trades increased 12.7 per cent over this period. Relative to in-training and commencement numbers, the increase in completions was rather modest but can be expected to improve over the next few years. Traineeship completions were a higher proportion of commencements than apprenticeship completions.

Completions increased in all occupations except mechanical and fabrication engineering and skilled agriculture and horticulture. The recent high growth in commencements in mechanical and fabrication engineering should raise completions in these occupations over the next few years. In a

<sup>40</sup> Note that even though the average annual growth is positive the total increase is negative. This is because the average is of the year-on-year changes and takes account of each year's data while the total change is the percentage change in the numbers in 2001 and 2005. The numbers in 2005 are slightly lower than in 2001.

tight labour market, employers often entice apprentices to delay or abandon training in return for higher wages and increased hours of productive work.

Data not available for this project show 18,000 cancellations and withdrawals from traditional trade apprenticeship contracts in 2002 (Brooks 2004). Some of these reappear as new contracts either with a new employer or another occupation.

**Table A10 Apprenticeship completions in the trades, 2001–05, Australia**

Occupation	Persons ('000)					% change 2001 to 2005	
	2001	2002	2003	2004	2005	Average annual	Total
Mechanical & fabrication eng	3.8	3.6	3.0	2.9	3.1	-4.5	-18.1
Automotive	3.5	3.7	4.1	4.1	4.0	3.8	15.3
Electrical & electronics	2.8	3.1	3.4	3.1	3.1	2.9	10.7
Construction	3.8	4.8	5.4	5.0	5.2	8.7	36.3
Food	1.8	1.9	1.9	2.0	1.8	1.1	4.0
Skilled agriculture & horticulture	0.8	0.9	0.9	0.9	0.7	-1.7	-9.0
Other trades	2.6	2.8	3.1	3.1	3.4	7.7	34.0
Apprenticeships	19.0	20.7	21.7	21.1	21.4	3.1	12.7
Traineeships	7.8	8.0	8.9	8.5	8.8	3.2	12.8
All contracted training	26.8	28.7	30.6	29.6	30.2	3.1	12.7

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

Note: Apprentice and trainee completions are reported each quarter. These are appropriately aggregated to give completions for each calendar year.

Table A11 shows the duration of completed apprenticeships reported from 2001 to 2005. By definition, apprenticeships take at least two years to complete. Most apprenticeships took between three and four years to complete although 20 per cent took between two and three years. Half of all traineeships took between one and two years to complete with most of the rest in less than one year. Apprenticeships in food and skilled agriculture and horticulture trades generally took less time to complete.

**Table A11 Time taken to complete apprenticeships in the trades, 2001 to 2005, Australia (%)**

Occupation	Time taken to complete					Total (%)	Total '000
	Less than 1 year	1–2 years	2–3 years	3–4 years	More than 4 years		
Mechanical & fabrication eng	0.0	0.0	15.2	76.8	8.0	100	16.3
Automotive	0.0	0.0	14.2	78.7	7.1	100	19.4
Electrical & electronics	0.0	0.0	12.6	77.1	10.3	100	15.6
Construction	0.0	0.0	18.9	73.3	7.8	100	24.3
Food	0.0	0.0	35.4	57.9	6.7	100	9.3
Skilled agriculture & hort.	0.0	0.0	53.2	44.1	2.7	100	4.1
Other trades	0.0	0.0	23.1	69.1	7.8	100	14.9
Apprenticeships	0.0	0.0	19.9	72.3	7.8	100	103.8
Traineeships	39.8	51.1	1.7	7.1	0.3	100	42.1
All contracted training	11.5	14.7	14.7	53.5	5.6	100	145.9

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

Note: Apprentice and trainee completions are reported each quarter. These are appropriately aggregated to give completions for each calendar year.

Given that most traditional apprenticeships took between three and four years to complete, and that most were undertaken on a full-time basis, it is not unreasonable to define the *apparent* completion rate as the ratio of the number of completions in year  $t$  to the number of commencements in year  $t-3$ .<sup>41</sup>

<sup>41</sup> Note that the apparent completion rate defined here is that of contracts of training. Calculation of student completion rates require linked data on individual students showing, among other things, cancellation/withdrawals and re-commencements. This type of analysis is beyond the scope of this project.

Table A12 shows the apparent completion rates for apprenticeships. It is clear from this table, as well as from Shah et al. (2005)<sup>42</sup>, that apparent completion rates can vary substantially from one year to another. The average completion rate over the two years 2004 and 2005 was 54.8 per cent.<sup>43</sup> However, apparent completion rates vary substantially across occupations. The rates in food and skilled agriculture and horticulture trades were significantly lower than in other occupations.<sup>44</sup> The apparent completion rate of only 35.3 per cent in the food trades is of particular concern.

**Table A12 Apparent completion rates of apprenticeships in the trades in 2004 and 2005, Australia**

Occupation	Commencements ('000)		Completions ('000)		Apparent completion rate (%)		
	2001	2002	2004	2005	2004	2005	Average
Mechanical & fabrication eng	4.4	5.2	2.9	3.1	64.7	59.4	61.8
Automotive	6.3	6.6	4.1	4.0	65.8	60.5	63.0
Electrical & electronics	4.7	5.3	3.1	3.1	66.5	58.2	62.1
Construction	8.2	11.0	5.0	5.2	61.3	47.4	53.3
Food	5.4	5.4	2.0	1.8	36.3	34.2	35.3
Skilled agriculture & horticulture	1.9	1.8	0.9	0.7	46.8	40.1	43.5
Other trades	5.5	5.8	3.1	3.4	56.3	59.3	57.9
<b>All apprenticeships</b>	<b>36.3</b>	<b>41.0</b>	<b>21.1</b>	<b>21.4</b>	<b>58.0</b>	<b>52.1</b>	<b>54.8</b>

Source: Unpublished NCVET data. Scope: persons aged 15–64 years.

Note: Apprentice and trainee completions are reported each quarter. These are appropriately aggregated to give completions for each calendar year.

### Training rates in occupations with traditional trade apprentices, 2001 to 2005

Toner (2003) analysed training rates<sup>45</sup> in the trades from 1974 to 2001. Toner's calculations of training rates included traineeships, which boosts in-training numbers after 1998. He showed that the overall training rate in these occupations hovered around an average of just over 12 per cent from 1974 to 1992. In 1993, there was a structural break with the rate declining to just over 10 per cent, where it remained until 2001.

Table A13 shows that even after excluding traineeships from the calculations, the overall training rate in the trades improved from 2001 to 2005 to the extent that in 2005 it was just below the average rate for the years 1974 to 1992.<sup>46</sup>

In 2005, the highest training rates were in food (19.2 per cent) and automotive (17.5 per cent) and the lowest in skilled agriculture and horticulture (4.8 per cent).

The training rates generally improved in all but one of the occupations. The highest increase was in food, with the rate rising 5.1 percentage points. A partial explanation for the increasing training rate in food occupations is the quite substantial decline in employment in these occupations. It is worth noting that with significant employment decline, relatively high training rates and low apparent completion rates, the food occupations, which include meat tradespersons and bakers, are precisely the area in which skill shortages have been reported recently and temporary overseas labour brought in to fill jobs. Further research is needed to explain these apparently contradictory trends.

<sup>42</sup> The lag for commencements used in this study was  $t-4$ .

<sup>43</sup> Ball and John (2005) estimated completion rates by following cohorts who commenced training in each year from 1995 to 1999. They reported 'contract' completion rates declining from 64.6 per cent in 1995 to 51.6 per cent in 1999.

<sup>44</sup> The apparent completion rate in these occupations changes little even if the lag year for commencements is increased by one to reflect somewhat shorter duration to completion.

<sup>45</sup> The training rate in an occupation is defined as the ratio of the number apprentices in training to the total number of persons employed in the occupation.

<sup>46</sup> If traineeships are included in the calculations, the training rate for 2005 is 13.5 per cent.

**Table A13 Apprenticeship training rates in the trades, 2001–05, Australia**

Occupation	Employment			Apprentices in-training as % of employment				
	2005 ('000)	Average annual change 2001 to 2005 (%)		2001	2002	2003	2004	2005
		2005 (%)	Total change 2001 to 2005 (%)					
Mechanical & fabrication eng	210.2	1.2	4.8	7.2	7.4	7.7	8.3	9.5
Automotive	136.8	0.4	1.6	14.9	15.0	15.3	16.0	17.5
Electrical & electronics	187.3	3.4	13.1	9.5	9.0	8.8	11.0	12.5
Construction	336.6	4.8	20.5	9.5	10.0	10.2	11.3	12.0
Food	81.0	-2.5	-10.1	14.1	15.6	15.3	16.8	19.2
Skilled agriculture & horticulture	86.7	4.8	20.1	5.9	5.5	5.3	4.8	4.8
Other trades	218.5	2.0	8.1	8.0	7.9	8.2	8.4	8.8
<b>All</b>	<b>1257.0</b>	<b>2.4</b>	<b>9.8</b>	<b>9.6</b>	<b>9.7</b>	<b>9.8</b>	<b>10.7</b>	<b>11.7</b>

Source: Apprentices: Unpublished NCVER data. Scope: persons aged 15–64 years. Employment: Unpublished ABS *Labour force survey* data (ABS Cat. no. 6202.0)  
Note: Apprentice and trainee numbers in-training are reported each quarter. These are appropriately averaged to give in-training numbers for each calendar year.

## Appendix 2 Additional tables

**Table A14 Qualifications by level and field of education, persons in the labour force, Australia, May 2005 ('000)**

Highest non-school qualification	Field of education											All
	Sci.	IT	Eng.	Arch. & bldg.	Agri. & environ.	Health	Edu.	Man. & comm.	Soc. & culture	Arts	Food hosp. & pers. <sup>a</sup>	
VET	34	112	984	355	131	248	96	859	259	123	343	3,544
<i>Adv diploma</i>	11	14	64	14	14	95	59	117	39	33	24	483
<i>Diploma</i>	10	38	38	12	18	34	12	125	57	33	18	395
<i>Certificate IV</i>	3	14	41	14	13	45	11	136	38	13	21	347
<i>Certificate III</i>	2	18	731	280	45	38	9	142	84	22	203	1,574
<i>Certificate II</i>	4	15	56	16	26	19	3	209	26	11	48	434
<i>Certificate I</i>	4	13	55	18	17	17	3	130	14	11	30	311
Higher Ed.	186	121	194	50	47	336	331	498	401	123	5	2,290
<b>Total</b>	<b>220</b>	<b>233</b>	<b>1,178</b>	<b>404</b>	<b>178</b>	<b>583</b>	<b>428</b>	<b>1,357</b>	<b>659</b>	<b>245</b>	<b>348</b>	<b>5,834</b>

Source: Unpublished ABS *Education and work surveys*, 2001–05 (ABS Cat. no. 6227.0). Scope: persons aged 15–64 years.

nfd = not further defined

Table only includes those in the labour force with qualifications.

Certificate III/IV nfd have been distributed proportionately across certificate III and certificate IV; certificate I/II nfd across certificate I and certificate II; and certificate nfd and Level not determined across certificate I, II, III and IV. Not defined field codes have been distributed similarly.

<sup>a</sup>Includes mixed field.

**Table A15 Employment by qualification and occupation, Australia, May 2005 ('000)**

Highest non-school qualification	Managers & admin.	Prof.	Associate prof.	Trades	Advanced clerical & service	Intermed.	Intermed. prod. & transport	Elem. clerical, sales & service	Labourers	Total
						clerical, sales & service		clerical, sales & service		
VET	266	379	528	779	143	601	242	239	220	3,396
<i>Adv diploma</i>	51	150	88	27	23	74	16	26	17	472
<i>Diploma</i>	33	68	91	27	16	87	12	24	19	377
<i>Certificate IV</i>	21	52	72	36	15	76	17	23	18	330
<i>Certificate III</i>	100	61	177	617	28	200	144	84	106	1,518
<i>Certificate II</i>	36	24	57	36	33	104	27	49	36	404
<i>Certificate I</i>	26	23	43	35	28	60	25	33	24	296
Higher education	251	1289	267	46	52	186	30	73	36	2,230
With qualifications	517	1,668	795	824	195	787	272	312	256	5,626
Without quals.	245	194	438	400	181	800	552	684	587	4,081
<b>All ('000)</b>	<b>762</b>	<b>1,862</b>	<b>1,233</b>	<b>1,224</b>	<b>376</b>	<b>1,588</b>	<b>823</b>	<b>996</b>	<b>843</b>	<b>9,707</b>

Source: Unpublished ABS *Education and work surveys*, 2001–05 (ABS Cat. no. 6227.0). Scope: persons aged 15–64 years.

nfd = not further defined

Certificate III/IV nfd have been distributed proportionately across certificate III and certificate IV; certificate I/II nfd across certificate I and certificate II; and certificate nfd and Level not determined across certificate I, II, III and IV. Not defined occupation codes have been distributed similarly.

**Table A16 Scenario I: Forecasts of employment by qualification and occupation, Australia, 2016, ('000)**

Highest non-school qualification	Managers & admin.	Prof.	Associate prof.	Trades	Advanced clerical & service	Intermed. clerical, sales & service	Intermed. prod. & transport	Elem. clerical, sales & service	Labourers	Total
VET	354	455	637	805	135	719	269	258	247	3,879
<i>Adv diploma</i>	68	179	106	27	23	89	18	27	19	557
<i>Diploma</i>	44	82	109	29	15	108	13	26	21	446
<i>Certificate IV</i>	28	65	85	37	15	88	19	26	19	381
<i>Certificate III</i>	133	72	214	638	28	242	162	91	121	1,699
<i>Certificate II</i>	48	29	71	38	29	120	30	53	40	458
<i>Certificate I</i>	34	27	53	36	25	72	28	35	27	338
Higher education	341	1565	333	46	57	223	33	77	40	2,715
With quals.	695	2020	970	851	192	942	302	335	287	6,594
Without quals.	325	238	535	417	184	942	612	740	646	4,639
All	1,020	2,258	1,505	1,268	375	1,884	914	1,075	933	11,233

**Table A17 Scenario II: Forecasts of employment by qualification and occupation, Australia, 2006 ('000)**

Non-school qualification	Managers & admin.	Prof.	Associate prof.	Trades	Advanced clerical & service	Intermed. clerical, sales & service	Intermed. prod. & transport	Elem. clerical, sales & service	Labourers	Total
VET	302	391	545	812	156	649	247	247	233	3,582
<i>Adv diploma</i>	59	150	91	31	25	78	18	27	18	496
<i>Diploma</i>	40	73	100	31	18	100	13	26	21	422
<i>Certificate IV</i>	23	56	76	41	17	84	19	24	19	359
<i>Certificate III</i>	109	65	181	631	33	225	144	90	113	1,590
<i>Certificate II</i>	43	24	57	39	35	106	28	48	39	420
<i>Certificate I</i>	28	23	39	39	28	57	26	32	24	295
Higher education	290	1,363	276	50	60	200	32	81	38	2,390
With quals.	592	1,754	820	862	216	849	280	328	271	5,973
Without quals.	255	197	420	411	186	809	544	656	592	4,069
All	847	1,951	1,240	1,273	402	1,658	823	984	863	10,042

**Table A18 Scenario II: Forecasts qualifications by occupation, Australia, 2016 ('000)**

Non-school qualification	Managers & admin.	Prof.	Associate prof.	Trades	Advanced clerical & service	Intermed. clerical, sales & service	Intermed. prod. & transport	Elem. clerical, sales & service	Labourers	Total
VET	458	426	768	841	187	962	321	384	321	4,669
<i>Adv diploma</i>	99	112	126	61	26	87	42	43	25	620
<i>Diploma</i>	101	113	202	66	31	222	25	57	41	859
<i>Certificate IV</i>	26	83	111	69	17	139	41	42	28	556
<i>Certificate III</i>	120	79	265	527	58	430	136	166	154	1,933
<i>Certificate II</i>	91	19	65	51	35	84	38	51	60	494
<i>Certificate I</i>	22	21	0	67	19	0	40	24	13	206
Higher education	440	1659	449	78	89	306	69	182	53	3,325
With quals.	899	2086	1,217	919	275	1,267	390	567	374	7,994
Without quals.	121	172	288	349	100	617	524	508	559	3,239
All	1,020	2,258	1,505	1,268	375	1,884	914	1,075	933	11,233