

CHAPTER 3

EMPLOYMENT STATUS OF AUSTRALIA'S STEM-QUALIFIED POPULATION

3

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KEY FACTS

1 EMPLOYMENT OF STEM-QUALIFIED PEOPLE IN AUSTRALIA

- ▶ The unemployment rate for STEM-qualified people was 3.7 per cent, lower than the unemployment rate for those with Non-STEM qualifications, at 4.1 per cent.
- ▶ For males with STEM qualifications, the unemployment rate was lower than for males with Non-STEM qualifications across all age groups; the opposite was true for females, with higher rates of unemployment for STEM-qualified compared to Non-STEM-qualified females.
- ▶ The unemployment rate for females was higher than for males for both VET and university level qualifications in STEM. The unemployment rate for females with university level qualifications was 5.2 per cent compared to 3.5 per cent for males; and 6.3 per cent compared to 3.3 per cent, respectively for those holding VET level qualifications.
- ▶ For individuals with STEM qualifications who were born in Australia, the unemployment rate, at 3.1 per cent, was lower compared to those born overseas, at 4.8 per cent.

2 OCCUPATIONS OF STEM-QUALIFIED PEOPLE IN AUSTRALIA

- ▶ Across all STEM disciplines, the most common occupation was as Technician and Trades Workers (33 per cent), while one quarter worked as Professionals and 15 per cent worked as Managers.
- ▶ The most common occupations of STEM-qualified people differed depending on level of qualification:
 - For people with a university-level STEM qualification, the most common occupation for both males and females was as Professionals (56 per cent and 52 per cent, respectively).

- For people with a VET-level STEM qualification, the most common occupation for males was as Technicians and Trades Workers (49 per cent), while for females the most common occupation was as Clerical and Administrative Workers (22 per cent).

3 INDUSTRIES OF EMPLOYMENT FOR STEM-QUALIFIED PEOPLE IN AUSTRALIA

- ▶ The most common industry of employment for STEM-qualified people was in Manufacturing, followed by Professional, Scientific and Technical Services, and Construction (17, 12 and 11 per cent, respectively).
- ▶ The most common industry of employment was different across the STEM fields:
 - Professional, Scientific and Technical Services was the most common industry for Science and IT (both at 17 per cent).
 - Those with qualifications in Mathematics were most likely to be employed in Education and Training (23 per cent).
 - Manufacturing was the top industry for Engineering qualification holders (22 per cent).
 - Individuals with Agriculture and Environmental Science qualifications were most commonly employed in the Agriculture, Forestry and Fishing industry (21 per cent).
- ▶ Eighty-five per cent of STEM-qualified people worked in the private sector compared to 77 per cent of Non-STEM-qualified people.

HOW MANY STEM-QUALIFIED PEOPLE ARE EMPLOYED IN AUSTRALIA?

Of the 2.3 million people with STEM qualifications in Australia in 2011, 1.7 million were employed—an increase of 14 per cent in the absolute number of people since 2006. The number of employed people with a Non-STEM qualification increased by 25 per cent over the same period—to a total of 4.2 million (Figure 3.1).

The largest increase in the number of employed people amongst the STEM fields was in IT, which increased by 25 per cent. The lowest increase was for Engineering and Mathematics, both at 11 per cent.

People with a STEM qualification were more likely to be working full-time than those with a Non-STEM qualification. More than four in five (84 per cent) of employed STEM-qualified people were working full-time, higher than

those with Non-STEM qualifications (68 per cent). Males were more likely than females to be working full-time for both the STEM and Non-STEM-qualified workforce (88 per cent and 63 per cent, respectively (Figure 3.2).

HOW MANY UNEMPLOYED STEM-QUALIFIED PEOPLE ARE THERE IN AUSTRALIA?

There were approximately 65 500 unemployed STEM-qualified people in 2011. This group has increased approximately 25 per cent since 2006. Meanwhile, the number of unemployed people with Non-STEM qualifications increased by around 49 per cent to 183 400 over the same period. The largest increases in unemployment across the STEM fields were in Science and Mathematics (46 and 37 per cent, respectively), while Engineering had the smallest, at 22 per cent (data not shown).

Figure 3.1: Percentage change (bars) and absolute change (data labels) in employed people by field, 2006 to 2011

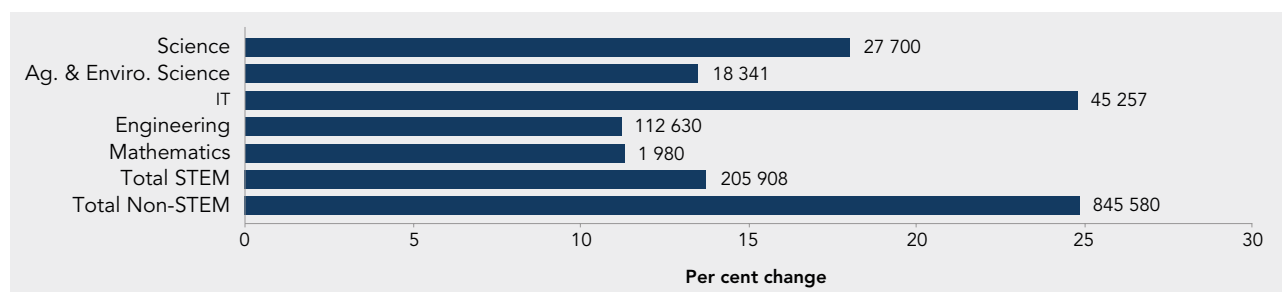
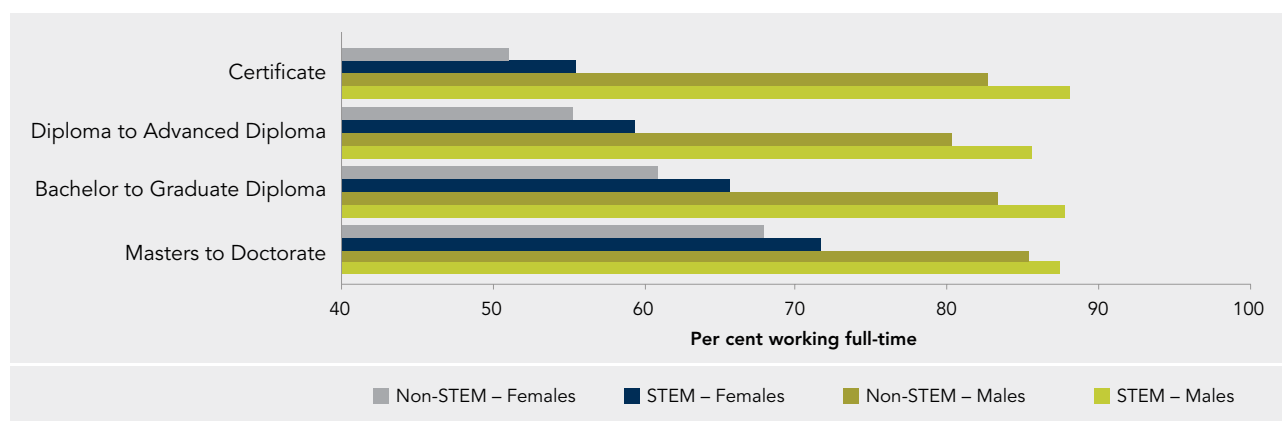


Figure 3.2: Percentage of employed people working full-time, by field, gender and level





HOW MANY STEM-QUALIFIED PEOPLE ARE NOT IN THE LABOUR FORCE IN AUSTRALIA?

In 2011, there were around 482 300 STEM-qualified people not in the labour force, 18 per cent more than in 2006. The number of Non-STEM-qualified people not in the labour force in 2011 was 1 256 100, a 27 per cent increase since 2006 (data not shown).

Within the STEM fields, the greatest increase in the number of people not in the labour force was among those with qualifications in Mathematics, IT and Science (40, 34 and 33 per cent, respectively) (data not shown).

HOW DOES THE EMPLOYMENT RATE OF STEM-QUALIFIED PEOPLE COMPARE ACROSS FIELDS?

In 2011, the unemployment rate of people with STEM qualifications was 3.7 per cent, and the unemployment rate for those with Non-STEM qualifications was 4.1 per cent. There was an increase in the unemployment rate across all fields between 2006 and 2011; however, the rate of increase was lower across the total STEM fields compared to Non-STEM fields (0.4 and 0.7 percentage points, respectively) (Figure 3.3).

Figure 3.3: Unemployment rate, by field, 2006 and 2011

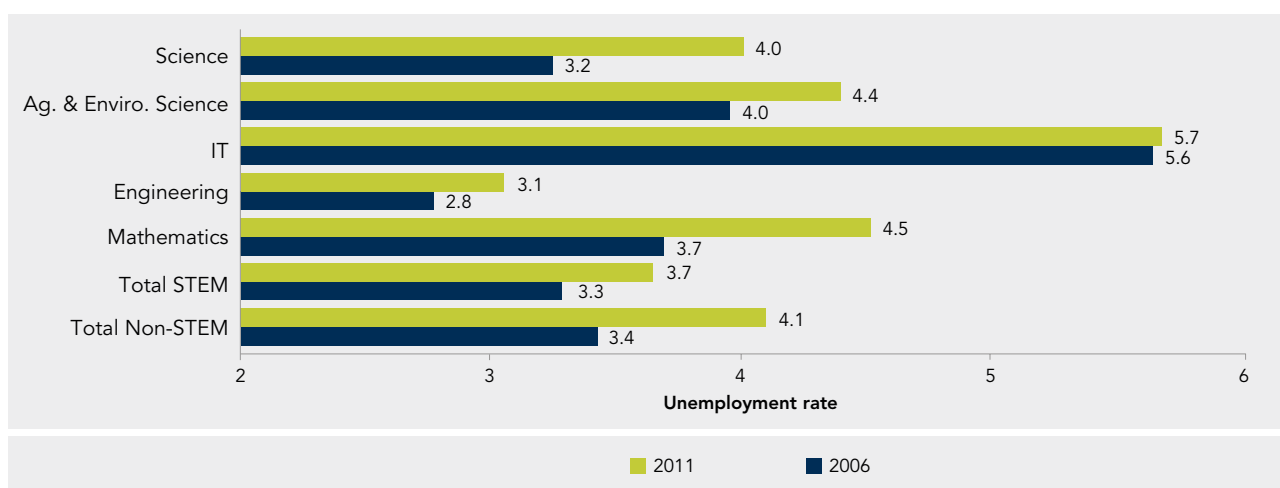


Figure 3.4: Unemployment rate, by field, level of qualification and gender

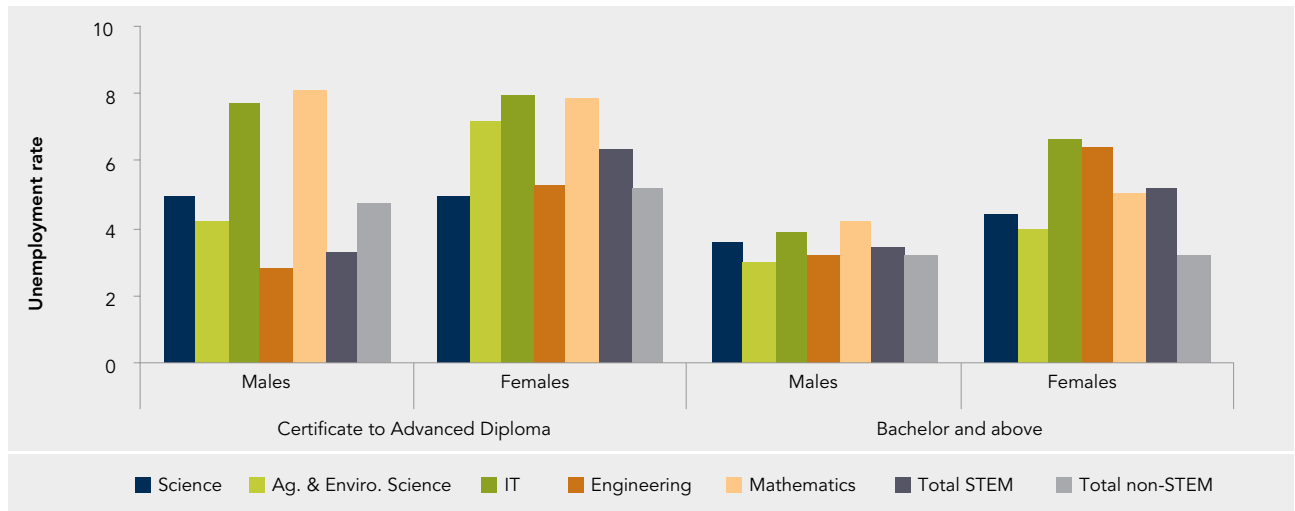
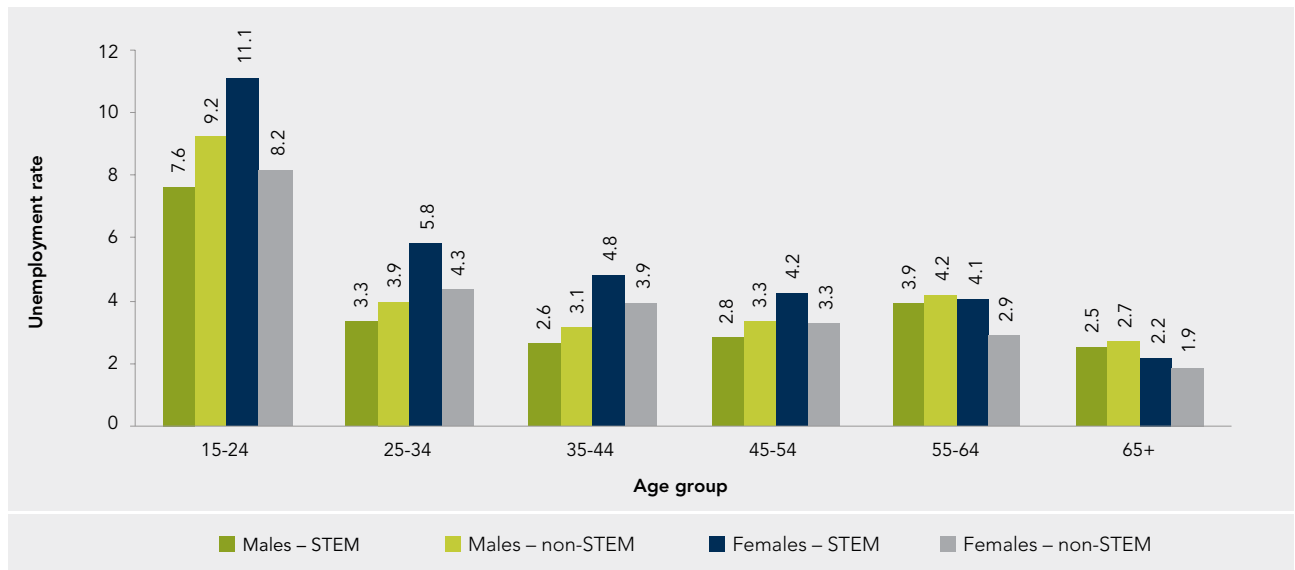


Figure 3.5: Unemployment rate, by field, age and gender



There were differences in the unemployment rate depending on gender and level of qualification (Figure 3.4). The unemployment rate for those with STEM qualifications was 5.2 per cent for females and 3.5 per cent for males with university level qualifications; and 6.3 per cent for females and 3.3 per cent for males with VET qualifications. The unemployment rate was higher among females than males across each STEM field at the university level; and all fields except Science and Mathematics at the VET level. The STEM field with the lowest unemployment at the university

level was Agriculture and Environmental Sciences for both males and females (3.9 and 4.0 per cent, respectively). At the VET level, males with Engineering qualifications and females with Science qualifications had the lowest unemployment rate (at 2.9 and 5.0 per cent, respectively).

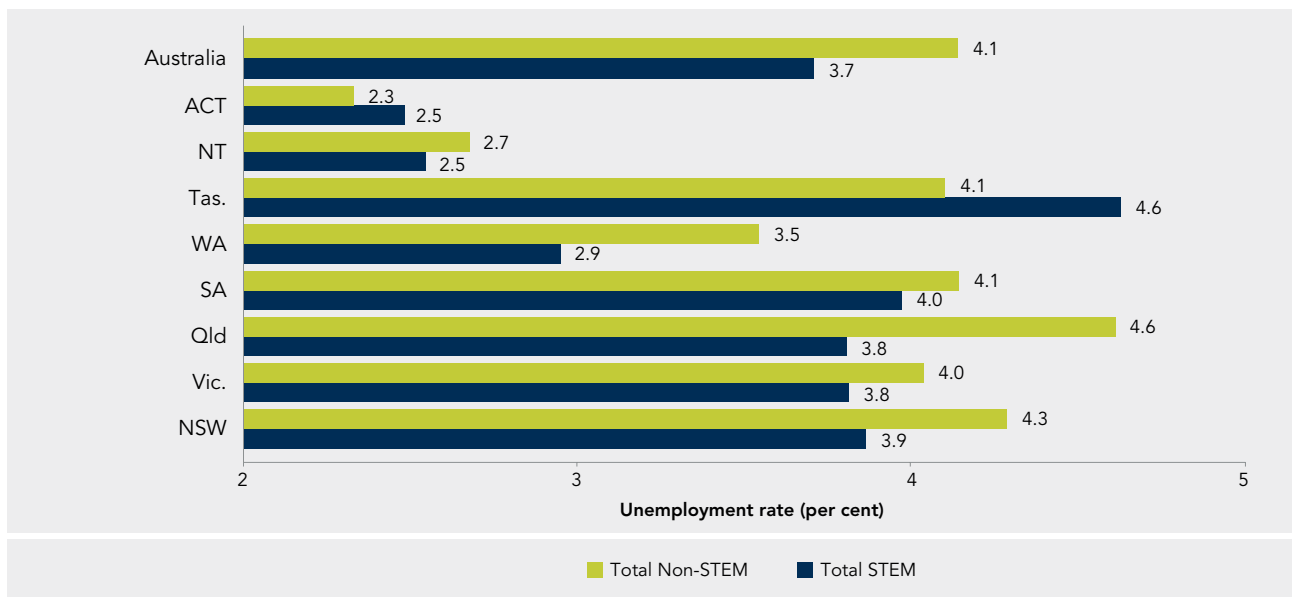
Across all age groups, the unemployment rate for males with STEM qualifications was lower than for those with Non-STEM qualifications. The opposite was true for females, with higher rates of unemployment for STEM-qualified females across all age groups (Figure 3.5).

Table 3.1: Unemployment rate, by state or territory of usual residence and field of highest post-secondary qualification (a)

	Science	Ag. & Enviro. Science	IT	Engineering	Mathematics	Total STEM	Total Non-STEM	Total population
NSW	4.3	4.3	5.8	3.2	4.4	3.9	4.3	5.2
Vic.	4.2	3.6	5.6	3.3	5.2	3.8	4.0	5.1
Qld	4.0	5.7	6.5	3.1	5.3	3.8	4.6	5.8
SA	4.4	4.7	6.4	3.4	4.0	4.0	4.1	5.8
WA	3.4	4.0	5.1	2.5	3.8	2.9	3.5	4.2
Tas.	4.2	5.4	8.9	4.0	3.9	4.6	4.1	5.2
NT	1.6	3.5	3.1	2.4	3.0	2.5	2.7	3.3
ACT	2.7	2.7	2.7	2.2	2.8	2.5	2.3	3.8
Australia (b)	4.0	4.4	5.7	3.1	4.6	3.7	4.1	5.1

Notes: (a) Of the population aged 15-64 years of those whose field of highest post-secondary qualification was both stated and adequately described.
 (b) Includes 'Other territories'.

Figure 3.6: Unemployment rate, by state or territory of usual residence and field of highest post-secondary qualification



ARE EMPLOYMENT LEVELS OF STEM-QUALIFIED PEOPLE DIFFERENT ACROSS STATES AND TERRITORIES?

In 2011, the unemployment rate was lower for STEM-qualified people compared to those with Non-STEM qualifications across all states and territories, except for the ACT and Tasmania (Table 3.1 and Figure 3.6). For STEM-qualified people, the unemployment rate was lowest in the ACT and NT (2.5 per cent), and highest in Tasmania (4.6 per cent). There was some variation in employment across different STEM fields in different geographic areas; for example, Science in the Northern Territory had the lowest unemployment rate at 1.6 per cent, while IT in Tasmania had the highest unemployment rate at 8.9 per cent (Table 3.1 and Figure 3.6).

DOES THE PLACE OF BIRTH AND DATE OF ARRIVAL FOR IMMIGRANTS MAKE A DIFFERENCE TO THEIR EMPLOYMENT?

In 2011, the unemployment rate was lower for people born in Australia than for people born overseas (Figure 3.7). This was the case for both STEM and Non-STEM-qualified people across all levels and fields of qualification. The difference was largest for those with qualifications in Science, and least for people with IT qualifications.

The unemployment rate was lower among qualified people who arrived in Australia prior to 2006 compared to more recent arrivals, for all fields except for IT (Figure 3.8). Foreign-born people with an IT qualification who arrived in Australia prior to 2006 had lower unemployment rates compared to those who arrived more recently, or those born in Australia (4.5, 9.3 and 5.4 per cent, respectively). The unemployment rate for people with Engineering qualifications was the lowest across all fields and immigration comparisons.

Unfortunately, the Census does not include information on where the qualification was obtained, so no conclusions can be drawn regarding the location from where a qualification was obtained with employment outcomes.

Figure 3.7: Unemployment rate of people living in Australia with post-secondary qualifications, by field and place of birth

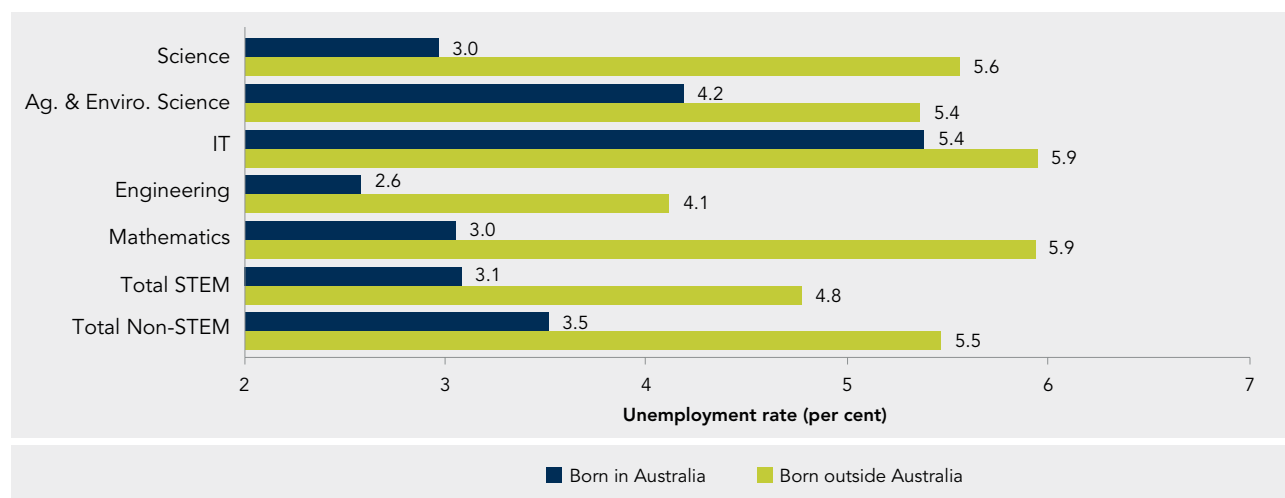


Figure 3.8: Unemployment rate of people living in Australia with post-secondary qualifications, by field, place of birth and date of arrival



WHICH INDUSTRY SECTORS EMPLOY STEM-QUALIFIED PEOPLE?

The most common industry of employment for people with STEM qualifications was Manufacturing, followed by Professional, Scientific and Technical Services, and Construction (17, 12 and 11 per cent, respectively) (Figure 3.9). For those with Non-STEM qualifications, the most common industry of employment was Health Care and Social Assistance, followed by Education and Training, and Professional, Scientific and Technical Services (20, 14 and 9 per cent, respectively).

The most common industry of employment for people with STEM qualifications was different depending on the field of qualification (data not shown):

- ▶ The Professional, Scientific and Technical Services sector was the most common sector of employment for IT and Science qualified people (28 and 17 per cent, respectively).

- ▶ Those with Mathematics qualifications were most likely to be employed in the Education and Training sector (23 per cent; with 11 per cent in Higher Education, 7 per cent in Secondary Education and 1 per cent in Primary Education).
- ▶ Manufacturing was the most common sector for Engineering qualified people (22 per cent).
- ▶ Those with Agriculture and Environmental Science qualifications were most likely to be employed in the Agriculture, Forestry and Fishing industry sector (21 per cent).

In 2011, the majority of employed STEM-qualified people worked in the private sector (85 per cent), compared to 77 per cent of people with Non-STEM qualifications (Table 3.2). Across the STEM fields, there were large differences in the sector of employment: for example 89 per cent of people with Engineering qualifications worked in the private sector, compared to 68 per cent of those with qualifications in Science.

Figure 3.9: Industry sector of employment, by field

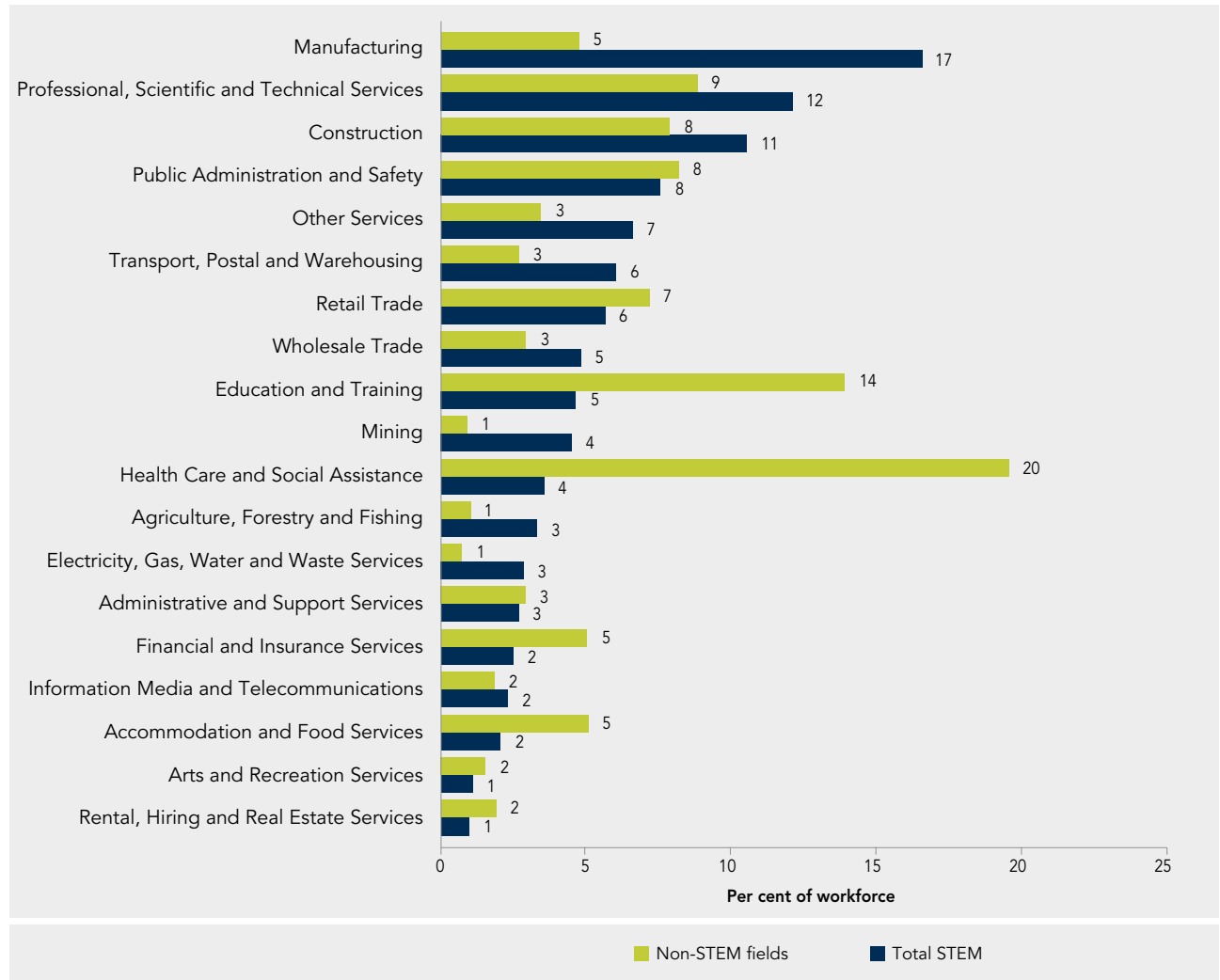


Table 3.2: Sector of employment, by field of highest post-secondary qualification

	Science	Ag. & Enviro. Science	IT	Maths	Eng.	Total STEM	Total Non-STEM
National Government	15	4	8	18	3	6	5
State/Territory Government	16	10	8	13	6	8	16
Local Government	1	6	1	1	2	2	2
Private sector	68	80	83	69	89	85	77

Figure 3.10: Occupations of people with a VET level qualification, by field

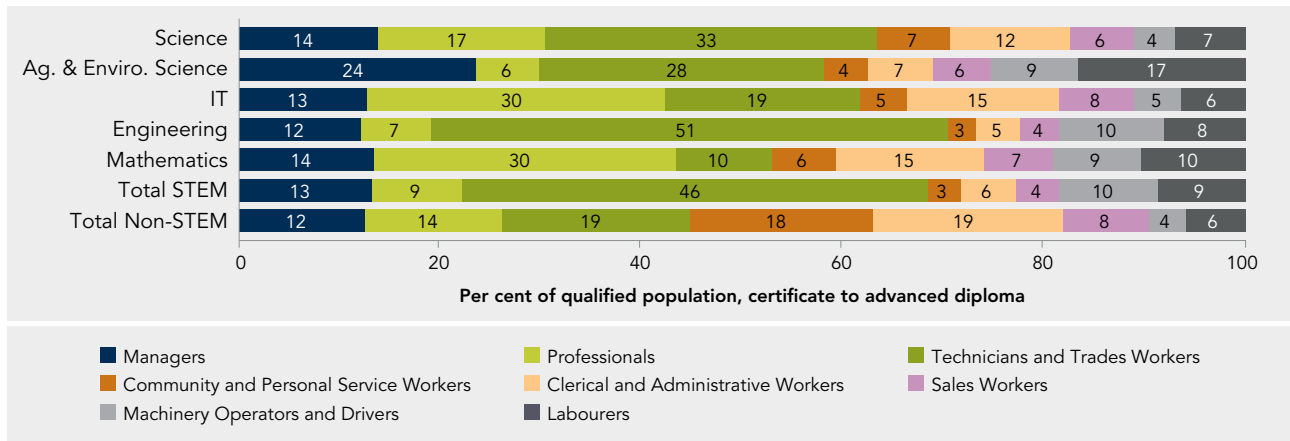
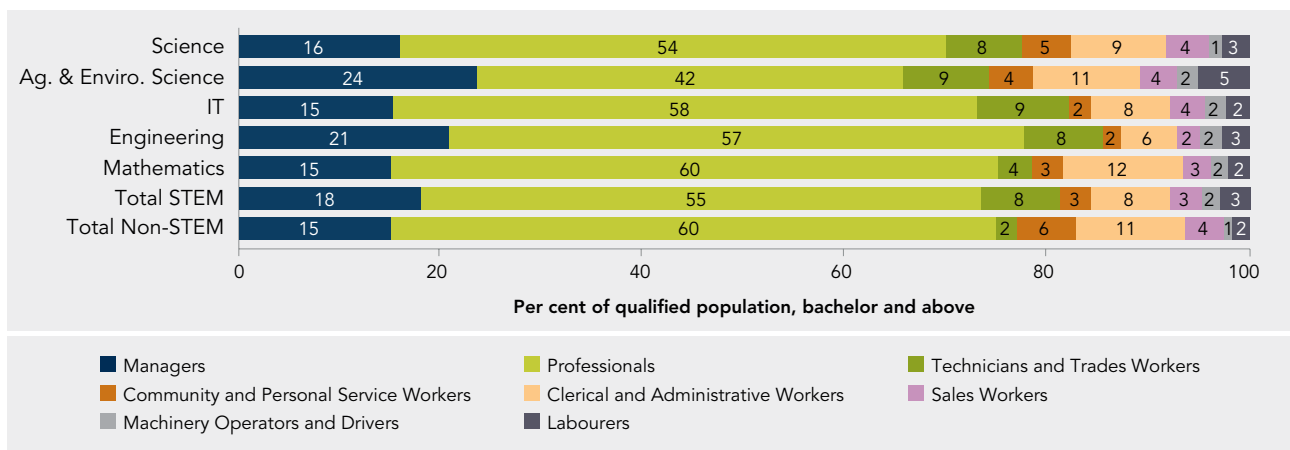


Figure 3.11: Occupations of people with a university level qualification, by field



WHAT ARE THE OCCUPATIONS OF STEM-QUALIFIED PEOPLE?

In 2011, one-third of the total STEM-qualified workforce was employed as Technicians and Trades Workers (data not shown). One quarter worked as Professionals, while 15 per cent worked as Managers. In comparison, the most common occupation for people with a Non-STEM qualification was as Professionals, followed by Clerical and Administrative Workers, and Managers (35, 15 and 14 per cent, respectively, data not shown).

The occupations of STEM-qualified people were different depending on the level of qualification (Figure 3.10 and Figure 3.11). For those with VET level qualifications, almost one-half of all STEM graduates were employed as Technicians and Trades Workers (46 per cent), while over

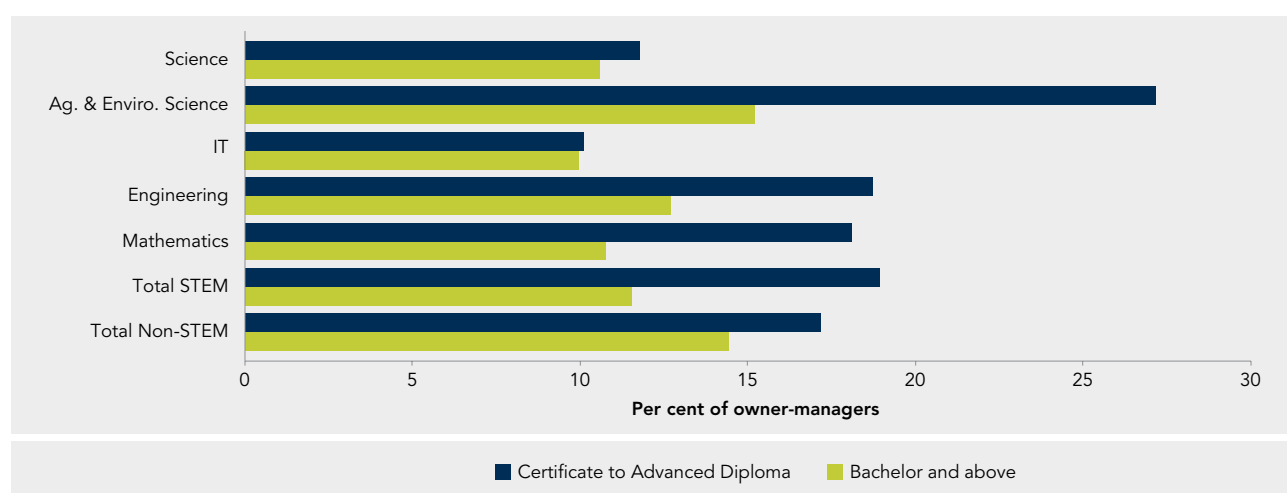
one half of those with university level qualifications were employed as Professionals (55 per cent). The occupations of qualified people also varied across fields at the VET level, while Professionals was the most common occupation across all fields amongst those with university level qualifications.

There were distinct differences in the occupations of STEM-qualified people by gender and qualification (Table 3.3). Among those with a bachelor degree or above, more than half of both males and females worked as Professionals (56 and 53 per cent, respectively). The highest occupation group for those with certificate to advanced diploma qualifications for males was as Technicians and Trade Workers (49 per cent), and as Clerical and Administrative Workers for females (22 per cent).

Table 3.3: Occupations of people with STEM qualifications, percentage by gender and level of highest post-secondary qualification

	Bachelor and above		Certificate to advanced diploma	
	Males	Females	Males	Females
Managers	20	13	14	11
Professionals	56	53	9	12
Technicians and Trades Workers	8	7	49	21
Community and Personal Service Workers	2	5	3	9
Clerical and Administrative Workers	5	14	4	22
Sales Workers	3	4	4	10
Machinery Operators and Drivers	2	1	10	4
Labourers	3	3	8	12

Figure 3.12: Business ownership, by field and level of qualification



HOW MANY STEM-QUALIFIED PEOPLE OWN THEIR OWN BUSINESSES?

The percentage of people who worked as owner-managers (and can be considered as owning their own businesses), was similar between the STEM and Non-STEM cohorts at the different levels—19 and 17 per cent at the VET level, and 12 and 14 per cent at the university level, respectively (Figure 3.12). People with VET level qualifications had a much higher level of business ownership compared to those with university level qualifications across all fields.

Across the different fields, business ownership was highest for those in Agriculture and Environmental Science, across all levels of qualification, at 27 per cent for those from VET and 15 per cent for those from university. Business ownership was lowest for those with IT qualifications for both the VET and university levels, at 10 per cent.



ARE THE SALARIES DIFFERENT BETWEEN STEM AND NON-STEM-QUALIFIED PEOPLE?

There are a number of differences in the personal income levels of STEM and Non-STEM-qualified people in Australia (Figure 3.13 and Figure 3.14). A higher percentage of people with STEM qualifications had an income in the highest bracket (more than \$104 000), and a lower percentage had an income in the lowest bracket (less than \$41 600), compared to those with Non-STEM qualifications, at both the VET and University levels.

Across all fields, a higher percentage of those with University qualifications had an income in the highest bracket compared to those with VET qualifications. The increase was larger for those with STEM qualifications than Non-STEM qualifications.

Figure 3.13: Personal income of people with VET level qualifications, by field

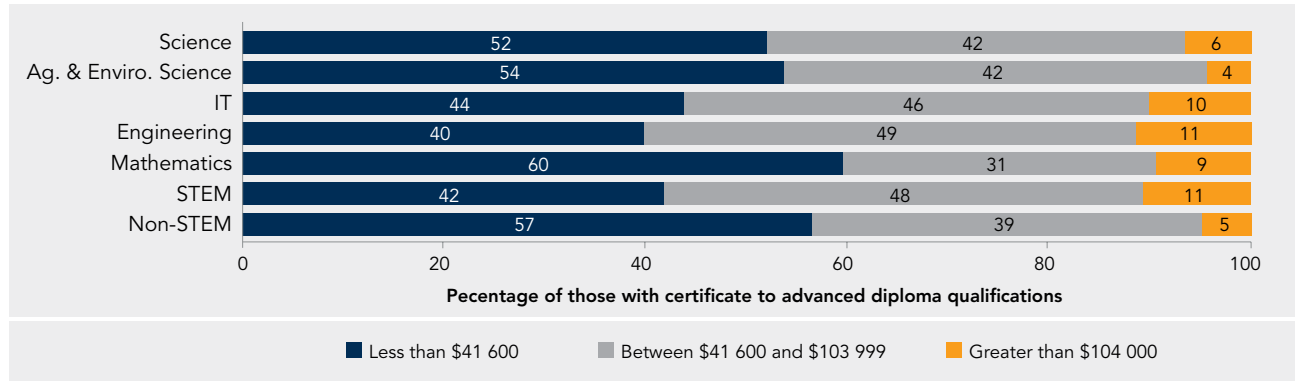


Figure 3.14: Personal income of people with university level qualifications, by field

