The returns to completion or partial completion of a qualification in the trades

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About the research

The returns to completion or partial completion of a qualification in the trades

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Many students do not complete full qualifications in the vocational education and training (VET) system because their intention is to obtain only the particular skills they require. This can be achieved through the acquisition of skill sets; these enable flexibility in training to quickly respond to changes in the labour market. Skill sets may also be more appealing to learners due to their relatively lower cost and shorter training duration. Despite the advantages of skill sets, it is clear from previous National Centre for Vocational Education Research (NCVER) research that VET students who complete a full qualification have better labour market outcomes than those who do not. Investigating partial completion allows us to consider the impact that completion of skill sets has on the returns to training.

Building on the previous research, this particular report focuses on the value of completing a qualification in the trades. Using data from the 2013 Student Outcomes Survey, the research quantifies the benefits of completion of a full qualification relative to partial completion of a qualification. The report also identifies the trade occupations to which completion of a full qualification matters most.

Key messages

- Completion of a full qualification in the trades on average leads to better employment outcomes than completion of modules only. Compared with module completers, graduates are estimated to have a 12% higher chance of being employed after training, a 27% higher chance of having their employment status improved after training, and a 71% higher likelihood of working in jobs that match their training.

- The wage gap between graduates and module completers is relatively small, with graduates estimated to annually earn 2.7% more than module completers.

- The returns to qualification completion vary greatly depending on the trade.

  - The labour market advantages of completion of a full qualification are stronger in the licensed trades than in the non-licensed trades.

  - Completion of a qualification in the electrotechnology and telecommunications trades leads to the highest income return.

  - The construction trades and the electrotechnology and telecommunications trades offer the strongest labour market outcomes to graduates.

Students who intend to study the trades should be encouraged to investigate the various types of trades and weigh up the possibilities and potential benefits to completing a full qualification. These findings emphasise the important role of career guidance for trade students while they are still engaged in the VET system.

Dr Craig Fowler
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While completion of a full qualification matters in the trades on average, the extent of the return from qualification completion varies greatly and depends on the trade area in which students completed their training.

Executive summary

One of the distinctive features of the Australian vocational education and training (VET) system is that many students do not complete qualifications. The commonly held view is that these students are typically not interested in qualifications, but rather complete a module or a set of modules to obtain particular skills and then leave the VET system. Furthermore, the general advances in information technology, the increased complexity of work and the drive for increased productivity demand significant advances in the skills held by workers. A consequence of these imperatives has been the introduction of skill sets, which have been developed by industry skills councils in training packages or developed by registered training organisations through consultation with their clients. While the aim of skill sets in the VET system is to enable a rapid response to the changes in labour market requirements, a common argument is that skill sets may limit individuals to narrow job roles and reduce their labour mobility.

This report seeks to determine the benefits of completing a VET qualification intended to prepare students for working as technicians and trade workers after training, the primary aim being to identify the type of trade[1] where completion of a full qualification matters the most. The trades for which the training is required are examined from the perspective of their licence requirements and their intended occupations, which are classified at the two-digit level of major group 3 of the Australian and New Zealand Standard Classification of Occupations (ANZSCO). The data examined for this study came from the 2013 Student Outcomes Survey, conducted by the National Centre for Vocational Education Research (NCVER).

Completion of a full qualification in the trades on average leads to better labour market outcomes than completion of a module or a set of modules. Individuals with a VET qualification in the trades are predicted to have an 11.8% higher likelihood of being employed after training, a 26.8% higher probability of having their employment status improved after training, and a 71.2% higher chance of working in jobs commensurate with their training than those who completed modules only. The estimated wage gap between graduates and module completers is 2.7%, which indicates that completion of a full qualification in the trades becomes less important when it comes to annual earnings.

While completion of a full qualification matters in the trades on average, the extent of the return from qualification completion varies greatly and depends on the trade area in which students completed their training.

- The construction trades and the electrotechnology and telecommunications trades are the two areas that offer graduates the strongest benefits. In particular, completion of a full qualification in the construction trades results in a 71% likelihood of being employed after training, 60% chance of improving employment status after training, and 67% probability of working in a job that matches the occupation for which the qualification is intended. For completion of a qualification in the electrotechnology and telecommunications trades, it is 59%, 60%, and 64% respectively. Graduates in the

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[1] Type of trade being the intended occupation or trade area.

electrotechnology and telecommunications trades are predicted to have the highest income returns, followed by graduates in the automotive and engineering trades.

- The labour market advantages of completion of a qualification are stronger in the licensed trades than qualification completion in the non-licensed trades. Graduates in the licensed trades are predicted to have 56—60% likelihood of being employed after training, or have their employment status improved after training, or work in jobs that match with their training, compared with 41—44% likelihood of graduates in the non-licensed trades. Graduates in the non-licensed trades are predicted to earn approximately $6700 annually less than graduates in the licensed trades after training.

Overall, the main implication of these findings is that completing a qualification in the trades does matter. Students need to be aware that there are different pay-offs from the trades areas they choose to study and from the different reasons for undertaking training (such as whether it is to get a job after training or to earn a higher income or to work in a job that matches with the training). As a result, students who intend to study the trades should be encouraged to undertake training in the areas where the returns from the labour market are greatest. The results therefore emphasise the important role of career guidance for trade students while they are still engaged in the VET system.

The labour market advantages of completion of a qualification are stronger in the licensed trades than qualification completion in the non-licensed trades.

ℹ Introduction

The aim of this report is to quantify the benefits of completing a VET qualification designed to prepare students for working as technicians and trade workers after training. The paper particularly seeks to identify the type of trade that will provide the best employment outcomes for individuals with a qualification.

Background

This research is motivated by two factors. First of all, many students who enter the VET system do not complete qualifications. The estimated qualification completion rate for the cohort commencing in 2011 was 35.5% (NCVER 2013). A recognised view is that these students are typically not interested in qualifications, but rather complete part of a course to obtain the particular skills they require and then leave the course before completion. Secondly, the general advances in information technology, the regulatory requirements of workplaces and the drive for increased productivity and accountability demand significant advances in the skills held by workers (Misko 2010; Mills et al. 2012a). A consequence of these imperatives has been the introduction of skill sets, which have been developed by industry skills councils in training packages or developed by registered training organisations through consultation with their clients. Misko (2010) identified 323 skill sets in training packages that were endorsed or still to be developed by August 2010, an increase of 145 skill sets from September 2009. By June 2014, the number of skill sets in training packages had increased to a total of 1125 (Hargreaves & Blomberg 2015). However, the popularity of skill sets has generated some debate about the role of skill sets versus broad-based qualifications. The introduction of skill sets creates the capacity and flexibility to quickly respond to the changes in labour market requirements, not to mention being more appealing to learners, with their relatively lower cost and shorter training duration. However, skill sets may limit individuals to narrow job roles and limit their adaptability and mobility in the labour market (Mills et al. 2012a).

Quantitative research studies have consistently found that VET students who complete a full qualification have better labour market outcomes than those who do not complete a full qualification. Stanwick (2005) found that, for young people aged 15 to 24 years and undertaking lower-level qualifications (certificates I and II), subjects-only completers generally have poorer employment outcomes than graduates. They are also more likely than graduates to report no job-related benefits from the course. Karmel and Nguyen (2007) investigated the benefits of completing a VET qualification in terms of the impact on wages. It was found that there are positive wage returns to completing a VET qualification for some students but not for others. Those who already had certificate II or below were found to receive higher wages from completing qualifications at certificate III or IV or diploma level, while those who already had certificate IV or higher qualification received no wage benefit from completing a further VET qualification at any level compared with those undertaking only modules at the certificate I or II level. A more recent study by Karmel and Fieger (2012) found that individuals with VET qualifications, on average, received higher returns than those VET students who did not complete a full qualification. Compared with VET graduates, those with incomplete qualifications were less likely to be employed after

training, or continue further study, or improve their employment circumstances (such as moving from unemployment before training to employment after training, moving to a higher-skill job after training or experiencing at least one job-related benefit from undertaking the training). Furthermore, being a VET graduate made it more likely that a person would earn a higher income after training. Similar to the research by Karmel and Nguyen (2007), the study finds that the extent of the pay-off to qualification completers varies across different groups of students. For example, students who were not in employment prior to training had the highest pay-off from completion in terms of being employed after training, while the pay-off from completion in terms of further study was highest for those undertaking their training at certificate I or II level.

To shed more light on the debate about broad-based qualifications versus skill sets, this study builds on the previous research by Karmel and Fieger (2012) by further exploring whether completion of a full qualification does matter for the trades, and for which intended occupation of a qualification in the trades it matters the most. It does so by examining four employment outcomes:

- the probability of being employed after training

- the probability of having improved employment circumstances after training

- the probability of being employed in the same occupation as training

- annual income.

In relation to each outcome, the primary interest of the paper is to estimate the returns for individuals who complete a full qualification in the trades (trade graduates) and those who successfully complete part of a course and then leave the VET system (referred to as module completers throughout the report) in a given training area. Students who undertake training intended to prepare them for working as technicians and trade workers have some distinct features compared with those undertaking VET qualifications in other occupations. In particular, they are more likely to be part of an apprenticeship or traineeship and are more likely to hold occupational licensing or registration. In this study, the types of trades are examined in terms of the six intended occupational groups specified in the ANZSCO sub-major group classifications:

- engineering, ICT and science technicians

- automotive and engineering trades workers

- construction trades workers

- electrotechnology and telecommunications trades workers

- food trades workers

- skilled animal and horticultural workers/other technicians and trades workers.

The paper also seeks to quantify the returns for graduates and module completers for trade occupations that require a licence by comparison with those that do not.

Students who undertake training intended to prepare them for working as technicians and trade workers have some distinct features compared with those undertaking VET qualifications in other occupations.

Research questions

This report addresses two key research questions. These are:

- What is, on average, the pay-off from qualification completion relative to completion of only modules in the trades?

- For which intended occupations does completion of a qualification in the trades matter most?

Research method

Data from the 2013 Student Outcomes Survey, conducted by NCVER, is used to answer the two key research questions. The completion of a module or a number of modules can be used as a proxy for skill sets since there is no flag for skill sets in the 2013 survey. Courses in the trades are those classified under the major group 3 (technicians and trade workers) of ANZSCO.

Some descriptive statistics on personal characteristics and training activity of both graduates and module completers are first provided. Following this, statistical models are constructed to estimate the relationship between each of the four outcomes and individual characteristics. Logistic regressions are used for the first three outcomes listed as a probability, whereas linear regressions are used for annual income after training. To address the first research question, the estimates from each regression are used to predict two outcomes for each student. One predicted outcome is conditioning on the student successfully completing the trade course, while the other predicted outcome is under the condition that the student completed modules only. The ratio of these two predicted outcomes represents the pay-off from qualification completion relative to module completion for each individual. The average pay-off is then calculated with respect to each of the four outcomes. The second research question is investigated using the coefficients of the training completion status variable, the intended occupation variable, and the interaction term, which is the product of the completion status variable and the intended occupation variable.

Structure of this report

The remainder of the report is in three main parts: first, an outline on the personal characteristics of graduates and module completers and their training experience in the trades; second, the modelling approach to estimate the returns to qualification completion and modules-only completion, after which the modelling results are discussed; and finally, some comments on the findings of the study and implications for policy.

Individual characteristics and training activity in the trades

To provide some context, it is useful to look at the individual characteristics of both trade graduates and module completers overall as well as their training experience in the trades. Trade courses are those that are intended to prepare students for working as technicians and trade workers after training (the major group 3 of ANZSCO).

Table 1   Characteristics of graduates and module completers in the trades, 2013 (%)

Characteristics	Graduates	Module completers
Age group		
15–24 years	50.4	38.8
25–34 years	23.5	24.5
35 years and over	26.1	36.7
Sex		
Males	77.7	79.0
Females	22.3	21.0
Location		
Major cities	60.7	59.9
Regional/remote	38.8	39.7
Unknown	0.5	0.5
Highest qualification before training		
Diploma and above	12.9	17.3
Cert. III/IV	25.1	27.1
Year 12	32.3	25.5
Year 11 and below or cert. I/II*	26.3	23.1
Not stated	3.4	7.0
Employment status before training		
Already worked in the intended trade occupation**	32.0	25.5
Worked in another trade occupation	5.9	7.0
Worked as a labourer	13.5	12.1
Worked in non-related trade occupations	27.3	27.0
Not working before training	17.7	21.0
Not stated	3.5	7.3
Total (%)	**100.0**	**100.0**
Total (estimated population)	**61 453**	**33 867**
Total (respondents)	**7 206**	**2 190**

Notes: * Includes did not go to school and miscellaneous.
   ** Trade occupations before training were matched with the intended occupations at the two-digit level of ANZSCO.
   Estimated population is based on the survey weights and is used as the base to calculate the percentages.
   Percentages do not sum to 100 due to rounding.
Source: NCVER, Student Outcomes Survey, 2013.

Half of graduates in the trades were young (aged 24 years or less). In contrast, more than half of module completers were from the more mature age group of 25 years and over, with 36.7% of module completers over the age of 34 years. As expected, trade graduates and module completers were predominantly male. Approximately two-thirds of graduates and module completers were located in the metropolitan area.

Around 44% of module completers in the trades had attained certificate III or above by comparison with 38% of trade graduates. A third of graduates had completed Year 12 before undertaking their trade training, followed by those holding certificate I/II or leaving school early. While early school leavers and certificate I/II holders made up 23.1% of module completers, around one in four module completers had completed Year 12. Approximately three-quarters of graduates and module completers had been employed before undertaking their training in the trades. Of these, almost a third of graduates and a quarter of module completers had worked in the intended occupation before training, while 14% of graduates and 12% of module completers had worked as labourers prior to their training.

Table 2 provides information on the training activity of graduates and module completers in the trades.

The majority of trade graduates and module completers had training at certificate III level (69.5% of graduates and 66.7% of module completers), followed by certificate IV (19% of graduates and 24.1% of module completers) and diploma and above (11% of graduates and 8.2% of module completers). There were very small proportions of graduates and module completers from certificate I or II levels. Training as a component of an apprenticeship or traineeship was more common among graduates, while module completers were more likely to undertake training that was not part of an apprenticeship or traineeship. Compared with other areas of the trades, the automotive and engineering trades accounted for the largest shares of trade graduates and module completers (21.0% and 26.8% respectively). By contrast, the smallest shares of graduates and module completers (6.0%) belonged to the skilled animal and horticulture trades.

Approximately 90.0% of trade graduates and 86% of module completers undertook their training for employment-related reasons. Of these, close to a third cited that undertaking training was a requirement for their current job. Around one in five module completers had training to gain extra skills for their current job, compared with 16.1% of trade graduates. While trade graduates were more likely than module completers to undertake training for getting a job or for a better job or for gaining promotion, trade graduates were less likely to undertake training for personal development compared with module completers. Only small proportions of trade graduates and module completers undertook training for further study.

Overall, the initial descriptive analysis shows that, before undertaking training in the trades, the majority of trade graduates and module completers had been employed, with approximately a third of graduates and one in four module completers already working in the occupation for which the course is intended. Compared with trade graduates, module completers were more mature and were more likely to have attained certificate III and above as their highest qualification prior to their training. Training at certificate III level and courses that are intended to prepare students for working as automotive and engineering trade workers accounted for the largest shares of graduates and module completers. Undertaking training as a component of an apprenticeship or traineeship was more popular among graduates than module completers. Employment-related reasons were most often cited by both graduates and module completers for undertaking training in the trades, with graduates being more likely to undertake training in order to get a job or to have a better job or promotion. On the other hand, module completers were more concerned with personal development than trade graduates.

Table 2   Training activity of graduates and module completers in the trades, 2013 (%)

Training activity	Graduates	Module completers
Qualification		
Diploma or above	11.0	8.2
Certificate IV	19.0	24.1
Certificate III	69.5	66.7
Certificate I/II	0.4	1.0
Apprenticeship or traineeship		
Training was part of an apprenticeship or traineeship	59.9	38.4
Training was not part of an apprenticeship or traineeship	39.0	59.7
Not stated	1.2	1.9
Training area		
Engineering, ICT and science technicians	20.5	15.0
Automotive and engineering trades workers	21.0	26.8
Construction trades workers	16.7	9.4
Electrotechnology and telecommunications trades workers	12.5	11.6
Food trades workers	8.6	14.2
Skilled animal and horticultural workers	5.9	6.0
Other technicians and trades workers	14.7	17.0
Main reason for undertaking training		
Employment-related	89.9	85.9
Get a job	19.2	18.0
Develop an existing business	1.9	2.4
Start my own business	4.7	4.1
Try for a different career	8.6	8.5
Get a better job or promotion	6.6	5.2
It was a requirement of my job	32.9	28.3
Gain extra skills for current job	16.1	19.5
Further study	1.7	0.9
Personal development	5.5	10.5
Not stated	2.8	2.7
Total (%)	**100.0**	**100.0**
Total (estimated population)	**61 453**	**33 867**
Total (respondents)	**7 206**	**2 190**

Notes: Estimated population is based on the survey weights and is used as the base to calculate the percentages.
Percentages do not sum to 100 due to rounding.

Source: NCVER, Student Outcomes Survey, 2013.

💧 The value of completing a full qualification or modules only in the trades

The aim of this research is to investigate how much on average the labour market rewards trade students who complete a full qualification as opposed to those who complete modules only. The research particularly aims to identify the training areas that offer positive employment prospects to trade graduates. To get a complete picture, the analysis is extended to estimate the returns to students who completed modules only, such that the return differential between graduates and module completers from the same training area is measured.

Modelling approach

The sample

As shown in table 2, the majority of graduates and module completers undertaking training in the trades were from certificate III level and above. There were only 86 graduates and module completers undertaking training at certificate I/II level, accounting for 0.9% of the total unweighted sample. As a result, the sample for modelling is restricted to those who undertook training in the trades at certificate III level and above.

Outcome variables

The research focuses on examining four labour market outcomes after training:

- the probability of being employed after training

- the probability of having improved employment circumstances after training

- the probability of being employed in the same occupation as training

- annual income.

In the Student Outcomes Survey, improved employment status refers to the situation whereby trade graduates and module completers moved from not being employed before training to being employed after training, or were employed at a higher skill level after training (based on the four-digit level of ANZSCO), or reported that they had received a job-related benefit after training. Annual earnings are mid-point values of the salary ranges reported in the survey. The last two outcomes (the probability of being employed in the intended occupation after training and annual income) are only examined for those who are employed after training.

Descriptive statistics for the four outcomes variables are provided in table 3.

Table 3   Descriptive statistics for outcome variables

Outcomes	Categories	n	N	% (weighted)	Mean
Employment status	Being employed after training	7 773	75 884	80.1	-
	Not being employed after training (reference category)	1 261	15 250	16.1	-
	Missing	276	3 594	3.8	-
Improved employment circumstances	Having improved employment circumstances after training	6 394	62 052	65.5	-
	Not having improved employment circumstances after training (reference category)	2 541	28 097	29.7	-
	Missing	375	4 579	4.8	-
Total		**9 310**	**94 729**	**100.0**	**-**
For those working after training					
Occupational matching (match at the two-digit level of ANZSCO)	Being employed in the destination occupation that matches with the intended occupation	4 268	42 650	56.2	-
	Not being employed in the destination occupation that matches with the intended occupation (reference category)	3 285	31 127	41.0	-
	Missing	220	2 107	2.8	-
Annual income	Known income (continuous)	7 371	71 922	5.2	51 234
	Missing	402	3 962	94.8	-
Total		**7 773**	**75 884**	**100.0**	

Note: Estimated population is based on the adjusted weights and is used as the base to calculate the percentages.
Source: NCVER, Student Outcomes Survey, 2013.

Explanatory variables

A number of predictors that reflect students' personal characteristics and training features in the trades are added in each model. The student attributes are gender, age, socioeconomic status, location, highest educational level prior to training, labour force status before training, and whether the student already worked in the intended occupation before training (based on the two-digit level of ANZSCO). Some added training attributes are students' completion status of a trade qualification (qualification completion or modules-only completion), the level of trade qualification being studied, and whether students undertook their training as part of an apprenticeship or traineeship. Descriptive statistics for these explanatory variables are provided in table 4.

Table 4   Descriptive statistics for predictors

Predictors	Categories	n	N	% (weighted)
Completion status	Graduates	7 155	47 743	50.4
	Module completers (reference category)	2 155	46 986	49.6
Sex	Males	6 909	73 381	77.5
	Females (reference category)	2 401	21 347	22.5
Age	35 years and over	3 576	29 039	30.7
	25–34 years	1 985	22 777	24.0
	15–24 years (reference category)	3 749	42 913	45.3
Highest qualification before training	Diploma and above	1 538	13 969	14.7
	Certificate III/IV	2 530	24 069	25.4
	Year 12	2 594	28 080	29.6
	Year 11 and below or certificate I/II* (reference category)	2 262	24 076	25.4
	Missing	386	4 535	4.8
Employment status before training	Employed full-time	5 450	52 383	55.3
	Employed part-time	1 860	19 613	20.7
	Not working before training (reference category)	1 613	18 029	19.0
	Missing	387	4 704	5.0
Match between the occupation before training and the intended occupation (at the two-digit level of ANZSCO)	Already worked in the intended trade occupation before training	2 773	28 856	30.5
	Did not work in the intended trade occupation before training (reference category)	6 150	61 169	64.6
	Missing	387	4 704	5.0
Training qualification	Diploma and above	1 052	9 518	10.0
	Certificate IV	2 129	20 031	21.1
	Certificate III (reference category)	6 129	65 179	68.8
Training was part of an apprenticeship or traineeship	Yes	4 523	49 119	51.9
	No (reference category)	4 666	44 316	46.8
	Missing	121	1 293	1.4
Socioeconomic status (SEIFA)	Low disadvantage	3 467	34 978	36.9
	Average disadvantage	2 125	20 907	22.1
	High disadvantage (reference category)	3 678	38 439	40.6
	Missing	40	405	0.4
Location	Major city	4 976	57 809	61.0
	Regional/remote area (reference category)	4 298	36 531	38.6
	Missing	36	389	0.4
Total		**9 310**	**94 729**	**100.0**

Notes: * Includes miscellaneous education and did not go to school.
   Estimated population is based on the adjusted weights and is used as the base to calculate the percentages.
   Percentages do not sum to 100 due to rounding.
   SEIFA = Socio-Economic Indexes for Areas.
Source: NCVER, Student Outcomes Survey, 2013.

It is expected that completion of a full qualification in the trades will have different returns compared with completion of a module or a set of modules and will depend on the area of the trades in which students undertook their training. To test this hypothesis, we add an independent variable (an interaction term) in each regression model, which is the product of the completion status variable and the training area of the trades variable.

One way to identify the type of trade is to look at the intended occupation in the trades for which the qualification has prepared graduates and module completers. This study follows the classification of seven sub-major groups under the major group 3 (Technicians and trade workers) of ANZSCO. They are:

- engineering, ICT and science technicians

- automotive and engineering trades workers

- construction trades workers

- electrotechnology and telecommunications trades workers

- food trades workers

- skilled animal and horticultural workers

- other technicians and trades workers.

However, only a small number of module completers who undertook training courses to prepare them to work as skilled animal and horticultural workers had complete data for modelling. As a result, graduates and module completers who undertook training in the skilled animal and horticulture trades are combined with those from the 'other' category. Table 5 provides descriptive statistics for the trade variable by six sub-major groups and the interaction term.

Another way to look at the trade areas is in terms of licence requirements. In several trade occupations, for example, electricians and plumbers, occupation-based licensing prevails and generally requires completion of a tfull qualification for the issue of a licence. Notably, a trade occupation requiring a licence in one state or territory may have a different arrangement in other jurisdictions. For consistency and transparency, this research report identifies licensed trade occupations as occupations in which registration or licensing *is* required as stated in ANZSCO. Table 6 presents a list of trade occupations that require registration or licensing and the expected qualification level for the issue of a licence for each occupation.

Table 7 provides descriptive statistics for the trade variable by licence requirements and the interaction term.

Table 5   Descriptive statistics for the trade variable based on six sub-major occupational groups and the interaction term between the trade variable and the completion status

Predictors	Categories	n	N	% (weighted)
Trade area	Engineering, ICT and science technicians	2 177	17 714	18.7
	Automotive and engineering trades workers	2 052	22 730	24.0
	Construction trades workers	1 162	12 108	12.8
	Electrotechnology and telecommunications trades workers	1 005	11 067	11.7
	Food trades workers	936	10 253	10.8
	Skilled animal and horticultural workers/other technicians and trades workers (reference category)	1 978	20 856	22.0
Completion status by trade area	Graduates as engineering, ICT and science technicians	1 721	10 543	11.1
	Graduates as automotive and engineering trades workers	1 498	10 091	10.7
	Graduates as construction trades workers	1 001	7 715	8.1
	Graduates as electrotechnology and telecommunications trades workers	793	5 246	5.5
	Graduates as food trades workers	633	4 034	4.3
	Graduates as skilled animal and horticultural workers/other technicians and trades workers	1 509	10 114	10.7
	Module completers as engineering, ICT and science technicians	456	7 172	7.6
	Module completers as automotive and engineering trades workers	554	12 639	13.3
	Module completers as construction trades workers	161	4 393	4.6
	Module completers as electrotechnology and telecommunications trades workers	212	5 821	6.1
	Module completers as food trades workers	303	6 219	6.6
	Module completers as skilled animal and horticultural workers/other technicians and trades workers (reference category)	469	10 742	11.3
Total		**9 310**	**94 729**	100.0

Notes: Estimated population is based on the adjusted weights and is used as the base to calculate the percentages.
Percentages do not sum to 100 due to rounding.
Source: NCVER, Student Outcomes Survey, 2013.

The returns to completion or partial completion of a qualification in the trades

Table 6   List of trade occupations requiring a licence

Occupations	Four/ six-digit ANZSCO	Expected qualification level	n	N	% (weighted)
Plumbing inspector	312115	Associate degree, advanced diploma, diploma	0	0	0.0
Mine deputy	312913	Associate degree, advanced diploma, diploma	0	0	0.0
Gunsmith	323312	Certificate III/IV			
Locksmith	323313	Certificate III/IV	18	160	1.4
Plumbers	3341	Certificate III/IV	327	3 196	27.1
Electricians	3411	Certificate III/IV	769	8 113	68.9
Shipwrights	399112	Certificate III/IV	2	12	0.1
Power generation plan operator	399213	Certificate III/IV	4	294	2.5
Total			**1 120**	**11 775**	100.0

Note: Estimated population is based on the adjusted weights and is used as the base to calculate the percentages.
Source: NCVER, Student Outcomes Survey, 2013.

The returns for module completers with respect to each intended occupational category should be viewed cautiously as a result of different types of module completers.

Table 7   Descriptive statistics for the trade variable based on licence requirement and the interaction term between the trade variable and the completion status

Predictors	Categories	n	N	% (weighted)
Trade area	Licensed trades	1 120	11 775	12.4
	Non-licensed trades (reference category)	8 190	82 953	87.6
Completion status by licence requirement	Graduates in licensed trades	916	5 933	6.3
	Graduates in non-licensed trades	6 239	41 809	44.1
	Module completers in licensed trades	204	5 842	6.2
	Module completers in non-licensed trades (reference category)	1 951	41 144	43.4
Total		**9 310**	**94 729**	100.0

Note: Estimated population is based on the adjusted weights and is used as the base to calculate the percentages.
Source: NCVER, Student Outcomes Survey, 2013.

Modelling steps

Logistic regressions are used for the first three outcome variables (the probability of being employed after training, the probability of having improved employment status after training, and the probability of being employed after training in the destination occupation that matches the intended occupation of the training activity). Linear regressions are applied for the annual income. Since missing data account for only a small proportion of the sample, imputation for missing data is not applied and regressions are based on complete observations only.

Logistic regressions and linear regressions are first run to model the impacts of individual characteristics and training attributes on each of the four labour market outcomes. In the first run, the trade variable with the six sub-major occupational groups and the interaction term, as listed in table 5, are used in each regression model.

To address the first research question, the coefficient estimates and the given characteristics of individuals and their training activity in each regression model are then

used to predict the corresponding outcome for each student under two scenarios: the student completing a qualification versus completing modules only. For example, with respect to the probability of being employed after training, every student will receive two scores. One score is the predicted probability of being employed after training if the student successfully completed a full qualification in the trades. The other score is the predicted probability of being employed after training if the student completed a module or a set of modules. The ratio of the two predicted probabilities for each person in both completion states represents the pay-off from qualification completion relative to modules-only completion. The average pay-off is then calculated. This technique is repeated for the remaining three outcomes.

With respect to the second research question, the returns to graduates and module completers in each intended occupation are determined based on the coefficients of the completion status variable, the trade variable with the six occupational categories and the interaction term in each model. The estimated returns will allow us to identify, from the six sub-major occupational groups, which intended occupation will offer the highest return for graduates and for module completers. These estimated returns also enable us to measure the disparity between graduates and module completers within a trade area.

The second research question is further explored from the perspective of licence requirements. Regressions are re-run for four outcome variables. In the second run, the trade variable is reclassified into two categories (licensed trades and non-licensed trades) and the corresponding interaction term, as listed in table 7, is used, while other explanatory variables remain the same in each regression.

Cautionary notes

It is acknowledged that the returns for module completers with respect to each intended occupational category should be viewed cautiously as a result of different types of module completers. For example, there are module completers who had already achieved the relevant base trade qualification for the issue of a licence (certificate III and above, as shown in table 6), had worked in the intended occupation before training, and had completed modules with the intention of upgrading their skills or perhaps moving to a more senior role, which may or may not involve an occupational change. There are also module completers who had worked in the intended occupation before training but who had not necessarily possessed the relevant base qualification, and those who undertook training to enter the intended occupation. As a result, estimating the returns for module completers without distinguishing these types of module completers may lead to biased results. However, table C1 in appendix C shows that, of all module completers, the numbers of module completers who had possessed a certificate III or above and who had already worked in the intended occupations before training are relatively small. As a result, the returns for module completers are measured without controlling for their previous qualification or their employment status before training.

At the time of selecting the survey sample, lags in reporting qualifications to the collection made it impossible to identify 'actual' module completers. Instead, a sample of potential module completers was selected for the survey. Braysher (2012) identified that the number of graduates could be overestimated in survey outputs, given that further investigation showed that a high proportion of potential module completers who reported they had completed

their course were not actually awarded the qualification they claimed. To more accurately report on student outcomes, Braysher (2012) developed a logistic model that takes account of students' demographic and training characteristics in predicting the eligibility of self-reported graduates for the qualification they claimed. Self-reported graduates who were predicted to be eligible for the claimed qualification were then reported as graduates, while those predicted to be ineligible were re-examined to determine whether they should be classified as module completers or as continuing students.

There may also be an issue of selection bias. For example, trade workers with high motivation and capability could be those who are more likely to complete a qualification in the trades. If the data do not capture or provide sufficient information on trade workers' characteristics, such as their motivation and capability, any estimated positive returns to qualification completion could be biased. The technique of propensity score weighting is used to improve the comparability between graduates and module completer groups and is based on observed characteristics. The weights that are incorporated into the regressions are the product of survey weights and propensity score weights. As a result, the effect estimates become less biased and the sample remains weighted to the original survey target population. Further information on the propensity score weighting method can be found in appendix A and for more details on applying propensity score methods to complex surveying, readers are referred to DuGoff, Schuler and Stuart (2014).

Results

The complete modelling results are provided in appendix B. Tables B1—B4 show the regression results where the trade variable is categorised into six sub-major intended occupations, while tables B5—B8 display the results where the trade variable is classified as licensed trades and non-licensed trades. Appendix C presents statistics for the predicted outcomes of graduates and module completers according to training area.

The overall pay-offs from completing a qualification in the trades are first discussed. The analysis on the estimated returns for graduates and module completers by the training areas follows. Beginning with the six intended occupations at the sub-major level of the ANZSCO, the analysis then moves to look at the intended occupations in terms of licence requirements. This section concludes with a summary that separately ranks the returns for graduates and module completers across the training areas of the trades in relation to each labour market outcome.

Overall pay-offs

Table 8 shows the overall pay-offs from qualification completion relative to modules-only completion with respect to each of the four examined labour market outcomes.

Table 8   Estimated average pay-off with respect to each outcome variable

Outcomes	Average pay-off from completing a qualification relative to completing a module or a set of modules in the trades
Being employed after training	1.1175
Having improved employment status after training	1.2678
Being employed in the intended occupation after training	1.7115
Annual income	1.0270

Note: The average pay-offs are derived by following the methodological approach of Karmel and Fieger (2012).

On average, completion of a qualification in the trades is more valued in the labour market than completion of a module or a set of modules. The pay-off from qualification completion relative to module completion, however, varies greatly across four labour market outcomes. A trade graduate is approximately 11.8% more likely to be employed after training than is a module completer. There is a 26.8% higher likelihood of having improved employment circumstances after training for those who completed a trade qualification by comparison with module completers. Trade graduates outperform module completers, with a 71.2% higher chance after training of working in an occupation that matches the intended occupation of the training activity, which is also the highest pay-off of the four outcomes. By contrast, the wage gap between graduates and module completers in the trades is relatively small (2.7%).

Overall, the results indicate that completion of a qualification in the trades is particularly important when it comes to outcomes such as being employed after training, experiencing improved employment circumstances after training, or working in jobs commensurate with training. Completion of a trade qualification becomes less of an issue when it comes to wages. These findings are consistent with the research outcomes of Karmel and Fieger (2012). They found that completion of a VET qualification overall results in a positive pay-off. Individuals with a VET qualification have a 21.7% higher likelihood of being employed after training and a 34.8% higher probability of experiencing improved employment status after training by comparison with those who did not complete a full qualification in VET. On the other hand, the outcome variable for which the pay-off is lowest is the salaries for those who are in full-time employment (0.3%; Karmel & Fieger 2012).

The returns vary by trade area

While completion of a qualification in the trades is beneficial on average across the four outcomes considered, the degree to which the labour market rewards trade graduates varies according to the trade area in which students undertook their training. It is noted that the predictions of return are determined using the variable of interest such as the completion status variable, the trade area variable, and the interaction term between the completion status variable and the trade area variable.

By sub-major groups

Figures 1 to 4 illustrate the returns for graduate and module completers across the six intended occupational groups at the sub-major level under major group 3 (Technicians and trade workers) of ANZSCO for each labour market outcome.

Figure 1 shows that overall graduates are more likely to be employed after training than module completers in the same training area. From the six intended occupations of the

trades, the difference in the likelihood of being employed after training between trade graduates and module completers is greatest in the construction trades and the automotive and engineering trades (71% versus 41% and 58% compared with 29% respectively). By contrast, the disparity is smallest in the combined group of skilled animal and horticultural workers and other technicians and trades workers (38% for graduates compared with 32% for module completers) and the engineering, ICT and science technicians (34% versus 27%).

Figure 1   Probability of being employed after training, for graduates and module completers by six sub-major intended occupations

	Engineering, ICT and Science Technicians	Automotive and Engineering Trades Workers	Construction Trades Workers	Electrotechnology and Telecommunications Trades Workers	Food Trades Workers	Skilled Animal and Horticultural Workers / Other
■ Graduates	0.34	0.58	0.71	0.59	0.47	0.38
□ Module completers	0.27	0.29	0.41	0.39	0.31	0.32
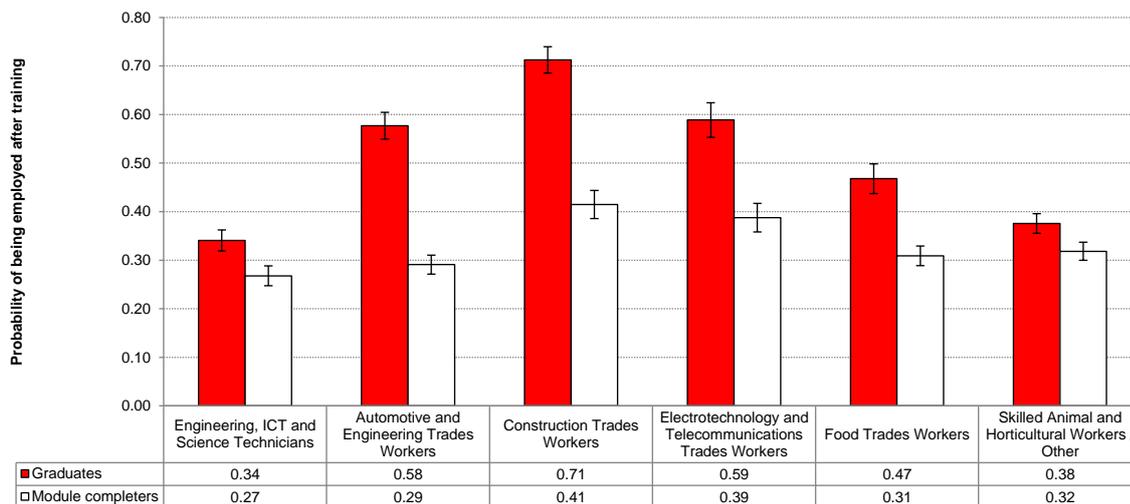
Note: The statistics for the predicted probability of being employed after training by six trade areas are provided in table C2.

Of all the trade graduates across the six training areas, graduates from the construction trades have the highest chance of being employed after training (71%), whereas it is lowest for graduates who undertook training intended to prepare them for working as engineering, ICT and science technicians (34%). Of all module completers, those in the construction trades are most likely to be employed after training (41%), followed by those in the electrotechnology and telecommunications trades (39%). In the construction trades, workers are required to successfully complete some units of competency on work health and safety in the construction industry to fulfil requirements for the White Card. The White Card gives them permission to commence work on a construction site (Australian Skills Quality Authority 2013). This could explain the stronger link between the probability of being employed after training and module completion in the construction trades compared with other occupational categories. Module completers from engineering, ICT and science have the minimum likelihood of getting a job after training (27%). Unlike other areas of the trades, where training will lead students to jobs in specific areas, engineering, ICT and science is a broader area of study, which could be the reason that the chances of getting a job for students undertaking this qualification are reduced. Another factor that contributes to their limited employment prospect is that a high percentage of graduates and module completers who undertook training in this area at the certificate III level and above were enrolled in further study after training (31.7%).

Figure 2 shows the estimated likelihood of having improved employment circumstances after training for graduates and module completers in each of the six intended occupations. Improved employment status after training in this context is employment status changing

from not employed before training to being employed after training, or employed at a higher skill level after training, or receiving a job-related benefit.

Figure 2   Probability of having improved employment circumstances after training, for graduates and module completers by six sub-major intended occupations

	Engineering, ICT and Science Technicians	Automotive and Engineering Trades Workers	Construction Trades Workers	Electrotechnology and Telecommunications Trades Workers	Food Trades Workers	Skilled Animal and Horticultural Workers / Other
■ Graduates	0.30	0.58	0.60	0.60	0.54	0.39
□ Module completers	0.21	0.28	0.34	0.35	0.34	0.27
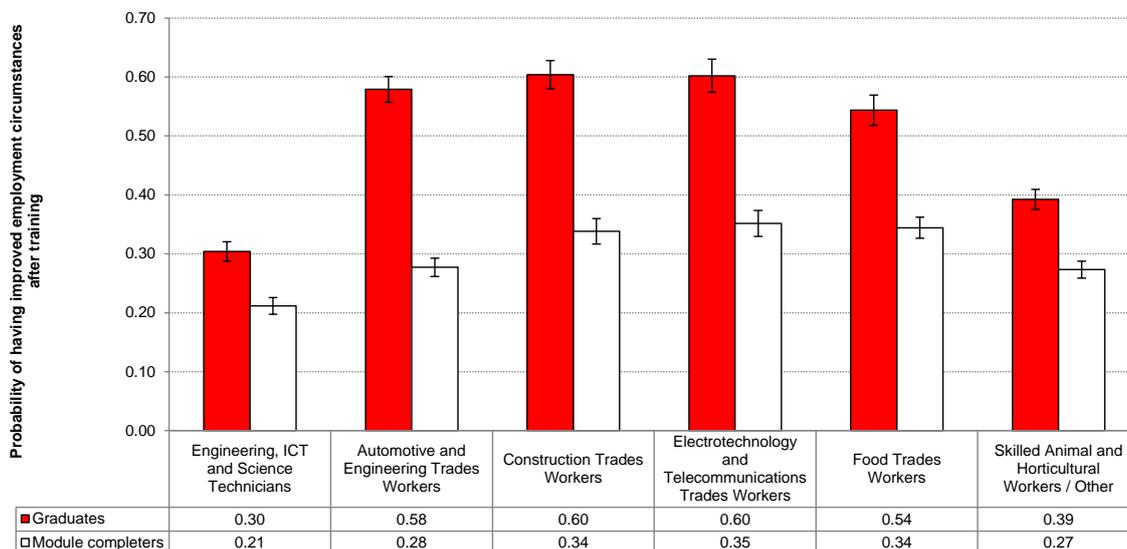
Note: The statistics for the predicted probability of having improved employment circumstances after training by six trade areas are provided in table C2.

Although graduates outperform module completers across the six intended occupations, the difference in the likelihood of having improved employment circumstances between graduates and module completers within the same training area greatly varies. The gap is greatest in three training areas: the automotive and engineering trades (58% against 28%), the construction trades (60% compared with 34%) and the electrotechnology and telecommunications trades (60% versus 35%). These three training areas of traditional apprenticeship are also the areas of study in which trade graduates are most likely to experience an improvement in their employment circumstances after training, compared with graduates from the remaining areas of the trades.

Of all graduates, the employment prospects are least likely to improve for students who completed a qualification designed for them to work as engineering, ICT and science technicians (30%). This could be explained by the fact that almost 41% of graduates who undertook this qualification at certificate III level and above were engaged in further study after training (unpublished data). Module completers from this area of study also have the lowest likelihood of improving their employment circumstances after training (21%) compared with module completers from other training areas. Around 36% of students who were employed after undertaking their training in engineering, ICT and science reported that they received no job-related benefits as a result of their training, compared with 9%—24% of students who were employed after training in other areas of the trades (unpublished data).

As expected, trade graduates tend to have much stronger matches between the intended occupation of the training and the jobs they get after training than module completers from the same training area (figure 3). This is because completion of a qualification enables students to perform a full occupational role for which the training has prepared them.

The returns to completion or partial completion of a qualification in the trades

Figure 3   Probability of being employed in the same occupation as training, for graduates and module completers who are employed after training by six sub-major intended occupations

	Engineering, ICT and Science Technicians	Automotive and Engineering Trades Workers	Construction Trades Workers	Electrotechnology and Telecommunications Trades Workers	Food Trades Workers	Skilled Animal and Horticultural Workers / Other
■ Graduates	0.36	0.53	0.67	0.64	0.52	0.37
□ Module completers	0.16	0.33	0.43	0.56	0.24	0.14
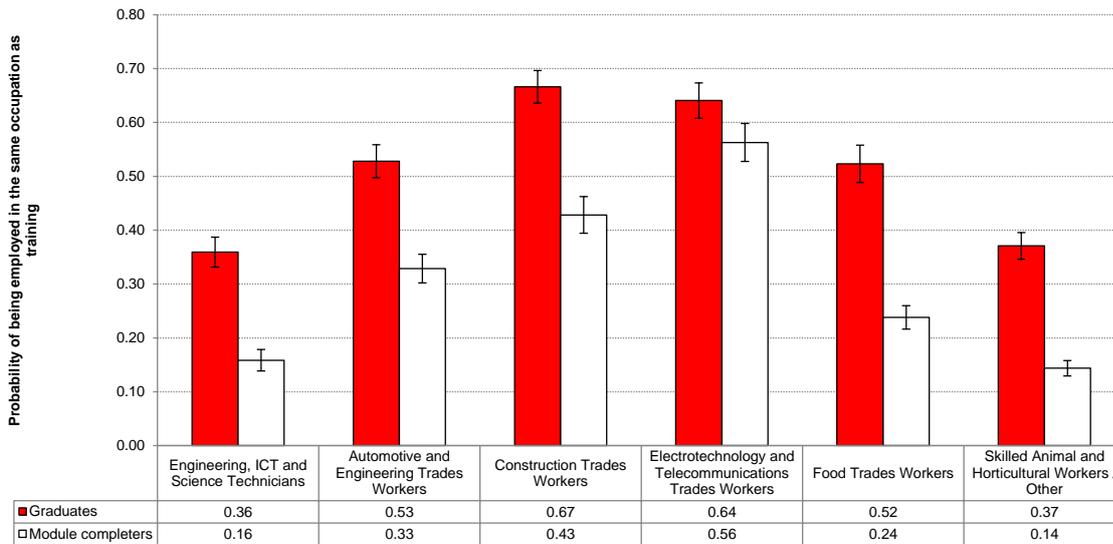
Note: The statistics for the predicted probability of being employed in the same occupation as training by six trade areas are provided in table C2.

Graduates in the construction trades have the highest chance of getting a job commensurate with their training (67%), followed by graduates in the electrotechnology and telecommunications trades (64%). By contrast, graduates who undertook training as engineering, ICT and science technicians have the smallest chance (36%) of all graduates to find a job that matches their training. Similarly, the chance for module completers from engineering, ICT and science is relatively small (16%) compared with module completers from other intended occupational categories, the exception being when they are compared with module completers from the skilled animal and horticulture and other trades (16% compared with 14% respectively).

The poor outcome for their job matching their training for graduates and module completers undertaking training as engineering, ICT and science technicians is not surprising, given that most traditional apprenticeships sit in other training areas of the trades. This finding is also supported by the previous work of Wibrow (2014). It was found that, at the sub-major level, graduates and module completers in this area of study have the lowest match of 22.1% and 12.1% respectively of all the intended occupational groups of the trades. However, the study reported that the training intended to prepare students for working as engineering, ICT and science technicians is not wasted. Of those employed after training, 54.6% of graduates and 53.9% of module completers from this area reported that the training is highly or somewhat relevant to their current jobs even though they do not end up working in the intended occupation. Compared with other training areas of the trades, this study area has the highest percentages of graduates and module completers who still find the relevance to their current job as a result of their training. Because this area offers students generic preparation rather than trains them for a specific area, it could be that students still have the ability and flexibility to apply their skills even when they end up in an occupation that is not matched with their training (Wibrow 2014).

There is a further reason why it is no surprise to find a disparity in the likelihood of occupational matching between graduates and module completers is smallest in the

electrotechnology and telecommunications trades compared with the gaps in other intended occupational categories. This is because a proportion of module completers in this area are in fact not new people looking to enter the occupation. Approximately 19% of module completers in the electrotechnology and telecommunications trades are already working in this area and possess a certificate III or above before undergoing training, compared with 5%—13% of module completers in other intended occupational categories (except for those in the automotive and engineering trades).

Unlike the first three post-training outcomes, where trade graduates consistently outperform module completers, figure 4 shows that the return differential between graduates and module completers becomes more moderate for annual income with respect to each intended occupation. In some intended occupations, module completers fare relatively better than graduates.

Figure 4   Average annual income after training, for graduates and module completers who are employed after training by six sub-major intended occupations

	Engineering, ICT and Science Technicians	Automotive and Engineering Trades Workers	Construction Trades Workers	Electrotechnology and Telecommunications Trades Workers	Food Trades Workers	Skilled Animal and Horticultural Workers / Other
Graduates	45,406	51,045	46,056	56,436	38,613	39,197
Module completers	50,152	43,953	42,190	49,855	38,201	43,694
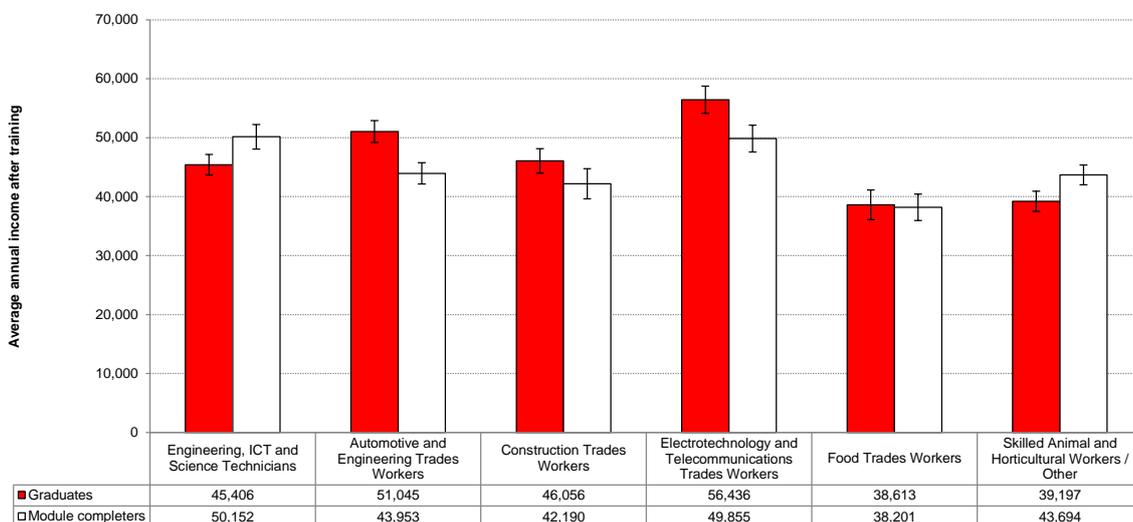
Note: The statistics for the predicted average annual income after training by six trade areas are provided in table C3.

On average, graduates from the electrotechnology and telecommunications trades are predicted to earn the highest annual income ($56 436), followed by graduates in the automotive and engineering trades ($51 045). These are also the areas of study where the income gaps between graduates and module completers are largest (approximately $7000). The area of study that gives low-income returns to students is food trades ($38 613 for graduates and $38 201 for module completers).

Module completers trained as engineering, ICT and science technicians and those from the electrotechnology and telecommunications trades have the highest annual income (approximately $50 000) when compared with the annual earnings of module completers from the other intended occupations. More interestingly, the income return for module completers trained as engineering, ICT and science technicians also exceeds the estimated return for graduates from the same training area ($50 152 compared with $45 406). That is because module completers trained as engineering, ICT and science technicians are more mature, with almost 60% aged 35 years and over, which indicates that they are likely to have more experience in the workforce (unpublished data). They are also more likely to work full-time after training.

Similar to the intended occupation of engineering, ICT and science technicians, module completers in the combined occupational group of skilled animals and horticultural workers and other technicians and trades workers have higher incomes than graduates from the same intended occupation. This could be because module completers in this area have more work experience, given that almost 68% of this group are aged 25 years and over compared with 50% of graduates (unpublished data). Another factor that contributes to this wage gap is that a proportion of module completers (7%) turn out to be employers.

By licence requirement

Figures 5 and 6 present the four predicted outcomes for graduates and module completers in licensed trades and non-licensed trades and show some similar patterns across the four outcomes. That is, within the same training area, graduates fare better than module completers with respect to each of the four outcomes. For example, compared with module completers in the licensed trades, students who completed a full qualification in the licensed trades are more likely to get a job after training (56% compared with 32% respectively), or have a greater chance to improve their employment status after training (57% compared with 30% respectively). Of those who are employed in the licensed trades after training, graduates are more likely to work in jobs that match their training and earn higher incomes than module completers (60% compared with 45%, $51 335 compared with $49 084 respectively). This is also true in the non-licensed trades, where graduates consistently receive better employment outcomes than module completers. Notably, the return differentials between graduates and module completers who undertook training in the same area of the trades are relatively large for the first three outcomes. The gaps, however, become less distinct when it comes to annual income after training.

Another similar pattern is that the labour market gives higher returns for graduates in the licensed trades than graduates in the non-licensed trades. Similarly, the estimated returns for module completers in the licensed trades consistently exceed the returns for module completers in non-licensed trades across the four outcomes. Since the majority of graduates and module completers who undertook training in the trade areas that require a licence are from courses that specifically prepare them to work as plumbers and electricians after training (96% as shown in table 6), it is not surprising that they are more likely to work in jobs that match their training than graduates and module completers in the non-licensed trades. As a result, completion of a qualification in the licensed trades offers students the highest returns, while the returns for module completion in non-licensed trades are poorest.

Of those who are employed in the licensed trades after training, graduates are more likely to work in jobs that match their training and earn higher incomes than module completers.

Figure 5   Probability of being employed after training, probability of having improved employment circumstances after training and probability of being employed in the same occupation as training, for graduates and module completers by licence requirement

	Probability of being employed after training		Probability of having improved employment circumstances after training		Probability of being employed in the same occupation as training	
	Licensed trades	Non-licensed trades	Licensed trades	Non-licensed trades	Licensed trades	Non-licensed trades
■ Graduates	0.56	0.44	0.57	0.44	0.60	0.41
□ Module completers	0.32	0.30	0.30	0.28	0.45	0.21

Notes: The statistics for the predicted probabilities by licensed trades and non-licensed trades are provided in table C4.

The probability of being employed in the same occupation as training is estimated for graduates and module completers who are employed after training.

Figure 6   Average annual income after training, for graduates and module completers who are employed after training by licence requirement
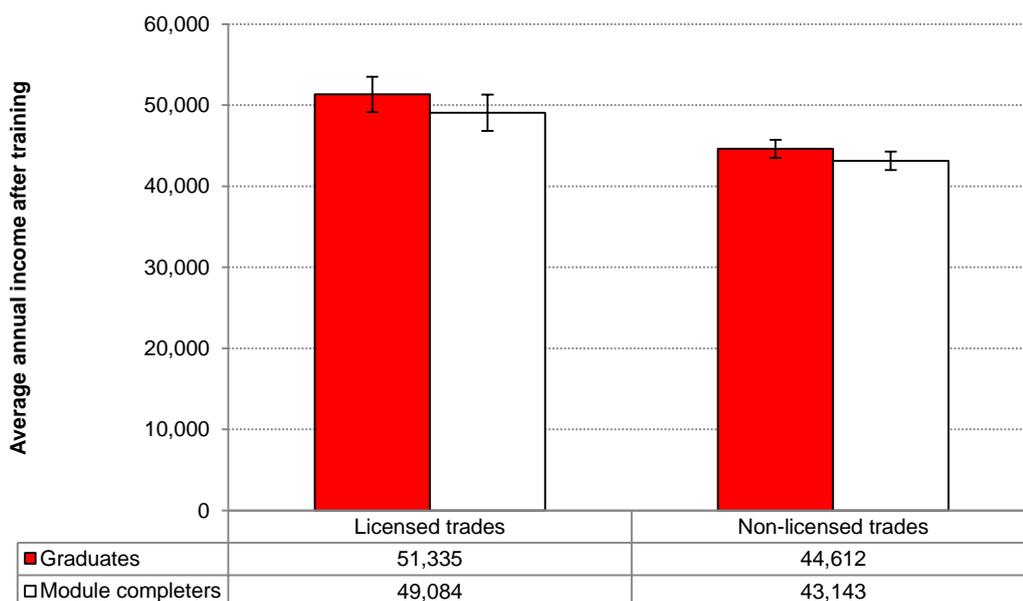
	Licensed trades	Non-licensed trades
■ Graduates	51,335	44,612
□ Module completers	49,084	43,143

Note: The statistics for the predicted average annual income after training by licensed trades and non-licensed trades are provided in table C5.

Summary of the results

Table 9 presents the rankings of the estimated returns separately for graduates and module completers with respect to the four employment outcomes by each of the trade types, from highest (denoted as 1) to lowest. The gaps represent the return differential between graduates and module completers from the same training area. Some highlighted findings are:

Of all graduates:

- Graduates in the construction trades are most likely to be employed after training and work in jobs that match with their training.

- Graduates in the construction trades and the electrotechnology and telecommunications trades are most likely to experience an improvement in their employment status after training.

- Graduates in the electrotechnology and telecommunications trades are estimated to earn the highest incomes after training.

- Graduates in licensed trades have better employment prospects than graduates in non-licensed trades.

Of all module completers:

- The likelihood of being employed after training is highest for module completers in the construction trades.

- The highest probabilities of having employment status improved after training or working in a job that matches the occupation for which the training is intended are highest for module completers in the electrotechnology and telecommunications trades.

- Module completers who undertook training to prepare them as engineering, ICT and science technicians and those in the electrotechnology and telecommunications trades are estimated to earn the highest incomes.

- Licensed trades offer higher returns for module completers than non-licensed trades.

With respect to each of the trade types, the positive gaps for the first three outcomes suggest that graduates are more likely to be employed after training, or have improved employment status after training, or have higher chances of being employed in the same occupation as their training than module completers from the same area. Compared with the income returns to module completers, graduates are also more likely to earn a higher income in most trades, with the exception of those trained as engineering, ICT and science technicians and in the combined group of skilled animal and horticultural workers and other technicians and trades workers. If the type of the trade is considered from the perspective of licence requirements, graduates outperform module completers within the same training area across the four outcomes considered.

The highest probabilities of having employment status improved after training or working in a job that matches the occupation for which the training is intended are highest for module completers in the electrotechnology and tele-communications trades.

Table 9   Rankings of the estimated returns for graduates and module completers with respect to each outcome by six sub-major intended occupations and by licence requirement

After training outcomes	Sub-major intended occupation (two-digit ANZSCO)						Intended occupation by licence requirement	
	Engineering, ICT and science technicians	Automotive and engineering trades workers	Construction trades workers	Electrotechnology and telecommunications trades workers	Food trades workers	Skilled animal and horticultural workers/other	With licence	Without licence
Probability of being employed								
Graduates	6	3	1	2	4	5	1	2
Module completers	6	5	1	2	4	3	1	2
Gap	+	+	+	+	+	+	+	+
Probability of having improved employment circumstances								
Graduates	5	2	1	1	3	4	1	2
Module completers	5	3	2	1	2	4	1	2
Gap	+	+	+	+	+	+	+	+
For graduates and module completers who are employed after training								
Probability of being employed in the same occupation as training								
Graduates	6	3	1	2	4	5	1	2
Module completers	5	3	2	1	4	6	1	2
Gap	+	+	+	+	+	+	+	+
Annual income								
Graduates	4	2	3	1	6	5	1	2
Module completers	1	3	5	2	6	4	1	2
Gap	-	+	+	+	+	-	+	+

Note: Gap = the estimated return for graduates – the estimated return for module completers.

💬 Final comments

This paper set out to determine, on average, how the labour market rewards students who complete a qualification relative to those who complete only modules in the trades, and to identify the trade area in which completion of a full qualification matters the most. The return from qualification completion or module completion in the trades was estimated with respect to four post-training outcomes: the probability of being employed; the probability of having improved employment circumstances; the probability of being employed in the same occupation as training; and annual income.

Not surprisingly, in relation to the four outcomes considered, completion of a full qualification in the trades results, on average, in higher returns than completion of a module or a set of modules. The overall pay-off from qualification completion relative to module completion is largest in the likelihood of working in jobs commensurate with training (71.2%), followed by the likelihood of having improved employment circumstances (26.8%), and the likelihood of being employed after training (11.8%). Qualification completion becomes less important in terms of annual income after training, given that graduates are predicted to annually earn 2.7% more than module completers.

While completion of a full qualification matters in the trades on average, the extent of the returns to qualification completion varies greatly and depends on the trade area in which students undertake their training. Completion of a full qualification in the construction trades and the electrotechnology and telecommunications trades leads to higher chances of students being employed after training, or having their employment status improved after training, or working in jobs that match their training than qualification completion in other training areas. Furthermore, graduates in the electrotechnology and telecommunications are estimated to earn the highest incomes after training, followed by graduates in the automotive and engineering trades. The labour market advantages of completion of a qualification are also stronger in the licensed trades than qualification completion in the non-licensed trades.

Overall, the main implication of these findings is that completing a qualification in the trades does matter. Students need to be aware that there are different pay-offs from different areas in the trades and that the different reasons for undertaking training (such as whether it is to get a job after training or to earn a higher income or to work in a job that matches the training) also have different pay-offs. As a result, students who intend to study the trades should be encouraged to investigate the various areas of the trades and weigh up the possibilities and potential outcomes. The results therefore emphasise the important role of career guidance for trade students while they are still engaged in the VET system.

Students who intend to study the trades should be encouraged to investigate the various areas of the trades and weigh up the possibilities and potential outcomes.

References

Australian Skills Quality Authority 2013, *Training for the white card for Australia's construction industry*, ASQA, Melbourne.

Braysher, B 2012, *An analysis of self-reported graduates*, NCVER, Adelaide.

DuGoff, EH, Schuler, M & Stuart, EA 2014, 'Generalizing observational study results: applying propensity score methods to complex surveys', *Health Services Research*, vol.49, no.1, pp.284—303, DOI: 10.1111/1475-6773.12090.

Hargreaves, J & Blomberg, D 2015, *Adult trade apprentices: exploring the significance of recognition of prior learning and skill sets for earlier completion*, NCVER, Adelaide.

Karmel, T & Fieger, P 2012, *The value of completing a VET qualification*, NCVER, Adelaide.

Karmel, T & Nguyen, N 2007, *The value of completing a vocational education and training qualification*, NCVER, Adelaide.

Mills, J, Bowman, K, Crean, D & Ranshaw, D 2012a, *Workforce skills development and engagement in training through skill sets: literature review,* NCVER, Adelaide.

——2012b, *Workforce skills development and engagement in training through skill sets*, NCVER monograph series no.11/2012, NCVER, Adelaide.

Misko, J 2010, *Responding to changing skill demands: training packages and accredited courses*, NCVER, Adelaide.

NCVER (National Centre for Vocational Education Research) 2013, *Australian vocational education and training statistics: the likelihood of completing a VET qualification, 2008—11*, NCVER, Adelaide.

Stanwick, J 2005, *Australian Qualifications Framework lower-level qualifications: pathways to where for young people?*, NCVER, Adelaide.

Wibrow, B 2014, *Qualification utilisation: occupational outcomes — overview*, NCVER, Adelaide.

📎 Appendix A: Propensity score regression

The logistic model used to determine the propensity scores is:

$Logit\ (y) = \boldsymbol{X\beta} + \boldsymbol{\epsilon}$

where y is a binary variable (completing a full qualification or completing modules) with the module completion as the reference category,

$\boldsymbol{X}$ is the design matrix for the intercept and individual characteristics. The observed characteristics included in the regression are: state where study was completed, gender, age, Indigenous status, training qualification, training as part of apprenticeship or traineeship,

$\boldsymbol{\epsilon}$ represents the error term and is normally distributed with zero mean and variance σ^2: $\boldsymbol{\epsilon} \sim N(\boldsymbol{0}, \boldsymbol{\sigma^2})$.

The probability of completing a trade qualification is determined as follows:

$$\hat{p} = \frac{exp(\boldsymbol{X\widehat{\beta}})}{1 + exp\ (\boldsymbol{X\widehat{\beta}})}$$

The propensity score weight for a student completing a trade qualification is

$$w_i = \frac{1}{\widehat{p_\iota}}$$

The propensity score weight for a student completing trade modules is

$$w_i = \frac{1}{1 - \widehat{p_\iota}}$$

Figure A1 shows that there are sizeable overlaps in the distribution between the graduate group and the module completer group, which indicates that the groups are comparable.

Figure A1   Histograms of propensity scores of the graduate group and the module completer group
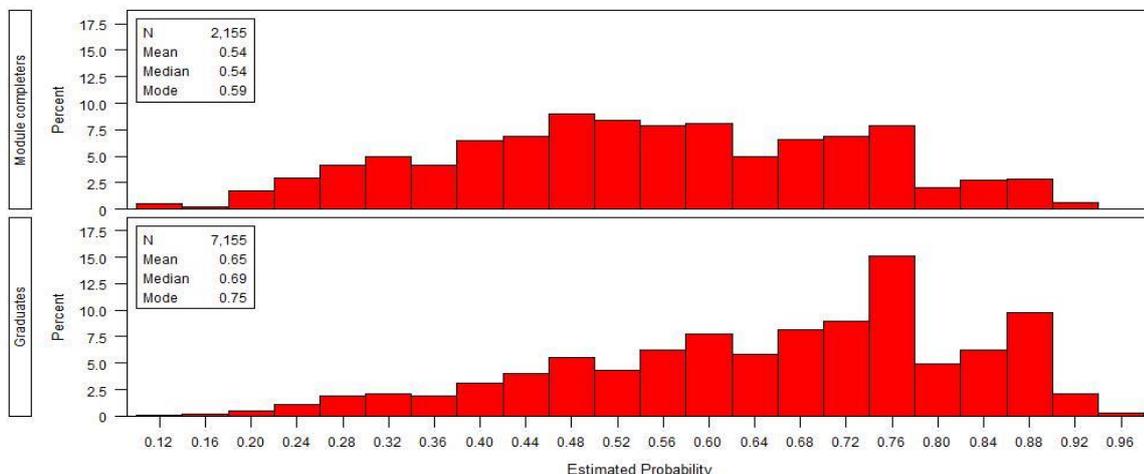
Table A1   Estimates from the propensity score regression

Parameter	Estimate	Standard error	Pr > ChiSq
Intercept	0.2855	0.0871	0.001
State/territory where training was completed			
New South Wales	1.0484	0.0650	<.0001
Victoria	-0.7652	0.0641	<.0001
Queensland	-0.0576	0.0644	0.3709
South Australia	0.8283	0.0704	<.0001
Western Australia	0.0735	0.0661	0.2665
Tasmania	-0.5593	0.0751	<.0001
Northern Territory	0.4046	0.0902	<.0001
Australian Capital Territory		Reference category	
Sex			
Male	-0.4645	0.0192	<.0001
Female		Reference category	
Age			
35 years and over	-0.1338	0.0205	<.0001
25–34 years	-0.1020	0.0201	<.0001
15–24 years		Reference category	
Highest qualification before training			
Diploma and above	0.2254	0.0703	0.0013
Certificate III/IV	0.4417	0.0693	<.0001
Year 12	0.5970	0.0691	<.0001
Year 11 and below or certificate I/II	0.5639	0.0692	<.0001
Unknown		Reference category	
Employment status before training			
Employed before training	0.5365	0.0676	<.0001
Not employed before training	0.1567	0.0693	0.0238
Unknown status		Reference category	
Training qualification			
Diploma and above	1.0959	0.0289	<.0001
Certificate IV	0.3165	0.0211	<.0001
Certificate III		Reference category	
Apprenticeship or traineeship			
Training was part of apprenticeship or traineeship	0.1938	0.0691	0.005
Training was not part of apprenticeship or traineeship	-0.9632	0.0697	<.0001
Unknown		Reference category	
n		9310	
Rescaled R-square		0.8115	

Tables A2 and A3 show that the propensity score weights improve the comparability between the graduate group and the module completer group based on observed characteristics.

Table A2 Percentages of graduates and module completers in the trades without propensity score weights and survey weights

Variables	Categories	Module completers	Graduates
Sex	Males	22.8	77.2
	Females	24.1	75.9
Age	35 years and over	28.1	71.9
	25–34 years	22.3	77.7
	15–24 years	18.9	81.1
Highest qualification before training	Diploma and above	29.3	70.7
	Certificate III/IV	23.7	76.3
	Year 12	18.2	81.8
	Year 11 and below or certificate I/II*	21.9	78.1
Employment status before training	Employed full-time	22.2	77.9
	Employed part-time	22.1	77.9
	Not working	25.0	75.0
Match between the occupation before training and the intended occupation (at the two-digit level of ANZSCO)	Already worked in the intended trade occupation before training	19.5	80.5
	Did not work in the intended trade occupation before training	24.1	75.9
Training qualification	Diploma and above	18.5	81.5
	Certificate IV	27.4	72.6
	Certificate III	22.5	77.6
Trade area	Engineering, ICT and science technicians	21.0	79.1
	Automotive and engineering trades workers	27.0	73.0
	Construction trades workers	13.9	86.1
	Electrotechnology and telecommunications trades workers	21.1	78.9
	Food trades workers	32.4	67.6
	Skilled animal and horticultural workers/ other technicians and trades workers	23.7	76.3
Licence requirement	Licensed trades	18.6	81.4
	Non-licensed trades	23.8	76.2
Training was part of an apprenticeship or traineeship	Yes	15.3	84.7
	No	30.6	69.4
Socioeconomic status (SEIFA)	Low disadvantage	23.9	76.2
	Average disadvantage	24.0	76.1
	High disadvantage	21.9	78.1
Location	Major city	24.2	75.8
	Regional/remote areas	21.8	78.2

Notes: * Includes miscellaneous education and did not go to school.
Percentages do not sum to 100 due to rounding.
Source: NCVER, Student Outcomes Survey, 2013.

Table A3 Percentages of graduates and module completers in the trades with propensity score weights and survey weights

Variables	Categories	Module completers	Graduates
Sex	Males	49.2	50.8
	Females	50.9	49.1
Age	35 years and over	50.0	50.0
	25–34 years	50.1	49.9
	15–24 years	49.1	50.9
Highest qualification before training	Diploma and above	51.0	49.0
	Certificate III/IV	48.8	51.2
	Year 12	49.5	50.5
	Year 11 and below or certificate I/II*	49.8	50.2
Employment status before training	Employed full-time	49.0	51.0
	Employed part-time	50.8	49.2
	Not working	50.1	49.9
Match between the occupation before training and the intended occupation (at the two-digit level of ANZSCO)	Already worked in the intended trade occupation before training	47.8	52.2
	Did not work in the intended trade occupation before training	50.4	49.6
Training qualification	Diploma and above	49.9	50.1
	Certificate IV	49.6	50.4
	Certificate III	49.6	50.5
Trade area	Engineering, ICT and science technicians	40.5	59.5
	Automotive and engineering trades workers	55.6	44.4
	Construction trades workers	36.3	63.7
	Electrotechnology and telecommunications trades workers	52.6	47.4
	Food trades workers	60.7	39.3
	Skilled animal and horticultural workers/ other technicians and trades workers	51.5	48.5
Licence requirement	Licensed trades	49.6	50.4
	Non-licensed trades	49.6	50.4
Training was part of an apprenticeship or traineeship	Yes	49.4	50.7
	No	49.9	50.1
Socioeconomic status (SEIFA)	Low disadvantage	48.8	51.2
	Average disadvantage	47.9	52.1
	High disadvantage	51.3	48.7
Location	Major city	49.9	50.1
	Regional/remote areas	49.1	50.9

Notes: * Includes miscellaneous education and did not go to school.
Percentages do not sum to 100 due to rounding.
Source: NCVER, Student Outcomes Survey, 2013.

Appendix B: Modelling results

Table B1   Estimates from the logistic regression with respect to the probability of being employed after training (six sub-major intended occupations)

Parameter	Estimate	Standard error	Pr > ChiSq
Intercept	-0.7613	0.0441	<.0001
Completion status			
Graduates	0.2532	0.0391	<.0001
Module completers		Reference category	
Trade area			
Food trades workers	-0.0424	0.0436	0.331
Electrotechnology and telecommunications trades workers	0.3043	0.0540	<.0001
Construction trades workers	0.4165	0.0550	<.0001
Automotive and engineering trades workers	-0.1294	0.0391	0.0009
Engineering, ICT and science technicians	-0.2445	0.0444	<.0001
Skilled animal and horticultural workers/other technicians and trades workers		Reference category	
Completion status by trade area			
Graduates as food trades workers	0.4220	0.0739	<.0001
Graduates as electrotechnology and telecommunications trades workers	0.5626	0.0844	<.0001
Graduates as construction trades workers	0.9991	0.0809	<.0001
Graduates as automotive and engineering trades workers	0.9478	0.0617	<.0001
Graduates as engineering, ICT and science technicians	0.0920	0.0576	0.1105
Graduates as skilled animal and horticultural workers/ other technicians and trades workers	0	.	.
Module completers as in food trades workers	0	.	.
Module completers as electrotechnology and telecommunications trades workers	0	.	.
Module completers as construction trades workers	0	.	.
Module completers as automotive and engineering trades workers	0	.	.
Module completers as engineering, ICT and science technicians	0	.	.
Module completers as skilled animal and horticultural workers/other technicians and trades workers		Reference category	
Sex			
Males	0.1075	0.0265	<.0001
Females		Reference category	
Age			
25–34 years	0.2440	0.0286	<.0001
35 years and over	0.2550	0.0278	<.0001
15–24 years		Reference category	
Highest qualification before training			
Year 12	0.3623	0.0257	<.0001
Certificate III/IV	0.6884	0.0301	<.0001
Diploma and above	0.8809	0.0363	<.0001
Year 11 and below or certificate I/II*		Reference category	
Employment status before training			
Employed part-time	1.6535	0.0281	<.0001
Employed full-time	1.8453	0.0273	<.0001
Not working		Reference category	

Parameter	Estimate	Standard error	Pr > ChiSq
Match between the occupation before training and the intended occupation (at the two-digit level of ANZSCO)			
Already worked in the intended trade occupation before training	0.0143	0.0289	0.6214
Did not work in the intended trade occupation before training		Reference category	
Training qualification			
Certificate IV	0.4142	0.0306	<.0001
Diploma and above	-0.0073	0.0379	0.8465
Certificate III		Reference category	
Apprenticeship or traineeship			
Training was part of an apprenticeship or traineeship	0.6112	0.0277	<.0001
Training was not part of an apprenticeship or traineeship		Reference category	
Socioeconomic status			
Average disadvantage	0.0823	0.0263	0.0017
Low disadvantage	0.3943	0.0239	<.0001
High disadvantage		Reference category	
Location			
Major city	-0.5110	0.0225	<.0001
Regional/remote area		Reference category	
n		8 807	
Rescaled R-square		0.8156	

Note: * Includes miscellaneous education and did not go to school.

Table B2 Estimates from the logistic regression with respect to the probability of having improved employment circumstances after training (six sub-major intended occupations)

Parameter	Estimate	Standard error	Pr > ChiSq
Intercept	-0.9778	0.0368	<.0001
Completion status			
Graduates	0.5403	0.0311	<.0001
Module completers		Reference category	
Trade area			
Food trades workers	0.3336	0.0361	<.0001
Electrotechnology and telecommunications trades workers	0.3659	0.0406	<.0001
Construction trades workers	0.3064	0.0427	<.0001
Automotive and engineering trades workers	0.0196	0.0308	0.5251
Engineering, ICT and science technicians	-0.3383	0.0347	<.0001
Skilled animal and horticultural workers/other technicians and trades workers		Reference category	
Completion status by trade area			
Graduates as food trades workers	0.2792	0.0613	<.0001
Graduates as electrotechnology and telecommunications trades workers	0.4861	0.0650	<.0001
Graduates as construction trades workers	0.5533	0.0604	<.0001
Graduates as automotive and engineering trades workers	0.7368	0.0479	<.0001
Graduates as engineering, ICT and science technicians	-0.0519	0.0450	0.2481
Graduates as skilled animal and horticultural workers/ other technicians and trades workers	0	.	.
Module completers as in food trades workers	0	.	.
Module completers as electrotechnology and telecommunications trades workers	0	.	.
Module completers as construction trades workers	0	.	.
Module completers as automotive and engineering trades workers	0	.	.
Module completers as engineering, ICT and science technicians	0	.	.
Module completers as skilled animal and horticultural workers/other technicians and trades workers		Reference category	
Sex			
Males	0.2267	0.0211	<.0001
Females		Reference category	
Age			
25–34 years	0.0631	0.0223	0.0047
35 years and over	-0.0986	0.0219	<.0001
15–24 years		Reference category	
Highest qualification before training			
Year 12	0.3102	0.0216	<.0001
Certificate III/IV	0.2887	0.0234	<.0001
Diploma and above	0.5397	0.0274	<.0001
Year 11 and below or certificate I/II*		Reference category	
Employment status before training			
Employed part-time	0.6058	0.0240	<.0001
Employed full-time	0.6853	0.0228	<.0001
Not working		Reference category	

Parameter	Estimate	Standard error	Pr > ChiSq
Match between the occupation before training and the intended occupation (at the two-digit level of ANZSCO)			
Already worked in the intended trade occupation before training	-0.0235	0.0202	0.2433
Did not work in the intended trade occupation before training		Reference category	
Training qualification			
Certificate IV	0.1572	0.0228	<.0001
Diploma and above	0.2357	0.0303	<.0001
Certificate III		Reference category	
Apprenticeship or traineeship			
Training was part of an apprenticeship or traineeship	0.9123	0.0214	<.0001
Training was not part of an apprenticeship or traineeship		Reference category	
Socioeconomic status			
Average disadvantage	0.0097	0.0206	0.6383
Low disadvantage	0.2584	0.0187	<.0001
High disadvantage		Reference category	
Location			
Major city	-0.2312	0.0171	<.0001
Regional/remote area		Reference category	
n		8 807	
Rescaled R-square		0.7482	

Note: * Includes miscellaneous education and did not go to school.

Table B3 Estimates from the logistic regression with respect to the probability of being employed in the same occupation as training for graduates and module completers who are employed after training (six sub-major intended occupations)

Parameter	Estimate	Standard error	Pr > ChiSq
Intercept	-1.7841	0.0591	<.0001
Completion status			
Graduates	1.2553	0.0482	<.0001
Module completers		Reference category	
Trade area			
Food trades workers	0.6204	0.0556	<.0001
Electrotechnology and telecommunications trades workers	2.0368	0.0608	<.0001
Construction trades workers	1.4952	0.0618	<.0001
Automotive and engineering trades workers	1.0702	0.0491	<.0001
Engineering, ICT and science technicians	0.1148	0.0665	0.0842
Skilled animal and horticultural workers / other technicians and trades workers		Reference category	
Completion status by trade area			
Graduates as food trades workers	0.0016	0.0845	0.9852
Graduates as electrotechnology and telecommunications trades workers	-0.9296	0.0805	<.0001
Graduates as construction trades workers	-0.2758	0.0803	0.0006
Graduates as automotive and engineering trades workers	-0.4288	0.0658	<.0001
Graduates as engineering, ICT and science technicians	-0.1644	0.0785	0.0362
Graduates as skilled animal and horticultural workers / other technicians and trades workers	0	.	.
Module completers as in food trades workers	0	.	.
Module completers as electrotechnology and telecommunications trades workers	0	.	.
Module completers as construction trades workers	0	.	.
Module completers as automotive and engineering trades workers	0	.	.
Module completers as engineering, ICT and science technicians	0	.	.
Module completers as skilled animal and horticultural workers / other technicians and trades workers		Reference category	
Sex			
Males	-0.0913	0.0332	0.0059
Females		Reference category	
Age			
25–34 years	0.0520	0.0307	0.0903
35 years and over	-0.5304	0.0325	<.0001
15–24 years		Reference category	
Highest qualification before training			
Year 12	-0.0429	0.0308	0.1635
Certificate III/IV	-0.1801	0.0357	<.0001
Diploma and above	0.2784	0.0402	<.0001
Year 11 and below or certificate I/II*		Reference category	
Employment status before training			
Employed part-time	-0.6623	0.0337	<.0001
Employed full-time	-1.4588	0.0335	<.0001
Not working		Reference category	

Parameter	Estimate	Standard error	Pr > ChiSq
Match between the occupation before training and the intended occupation (at the two-digit level of ANZSCO)			
Already worked in the intended trade occupation before training	4.1106	0.0353	<.0001
Did not work in the intended trade occupation before training		Reference category	
Training qualification			
Certificate IV	-0.0558	0.0338	0.0987
Diploma and above	-0.3699	0.0512	<.0001
Certificate III		Reference category	
Apprenticeship or traineeship			
Training was part of an apprenticeship or traineeship	1.7012	0.0308	<.0001
Training was not part of an apprenticeship or traineeship		Reference category	
Socioeconomic status			
Average disadvantage	0.3580	0.0305	<.0001
Low disadvantage	0.2874	0.0265	<.0001
High disadvantage		Reference category	
Location			
Major city	-0.0641	0.0242	0.0082
Regional/remote area		Reference category	
n		7 418	
Rescaled R-square		0.9982	

Note: * Includes miscellaneous education and did not go to school.

Table B4   Estimates from the linear regression with respect to annual income for graduates and module completers who are employed after training (six sub-major intended occupations)

Parameter	Estimate	Standard error	Pr > |t|
Intercept	20698.09	1364.68	<.0001
Completion status			
Graduates	-4496.58	1096.76	<.0001
Module completers		Reference category	
Trade area			
Engineering, ICT and science technicians	6458.06	1290.44	<.0001
Automotive and engineering trades workers	259.09	1117.87	0.8167
Construction trades workers	-1504.25	1430.92	0.2932
Electrotechnology and telecommunications trades workers	6161.19	1317.24	<.0001
Food trades workers	-5492.87	1314.62	<.0001
Skilled animal and horticultural workers/other technicians and trades workers		Reference category	
Completion status by trade area			
Graduates as engineering, ICT and science technicians	-249.39	1628.49	0.8783
Graduates as automotive and engineering trades workers	11588.60	1500.30	<.0001
Graduates as construction trades workers	8362.84	1781.03	<.0001
Graduates as electrotechnology and telecommunications trades workers	11077.63	1775.15	<.0001
Graduates as food trades workers	4908.60	1937.80	0.0113
Graduates as skilled animal and horticultural workers/ other technicians and trades workers	0	.	.
Module completers as engineering, ICT and science technicians	0	.	.
Module completers as automotive and engineering trades workers	0	.	.
Module completers as construction trades workers	0	.	.
Module completers as electrotechnology and telecommunications trades workers	0	.	.
Module completers as food trades workers	0	.	.
Module completers as skilled animal and horticultural workers/other technicians and trades workers		Reference category	
Sex			
Males	11434.53	750.63	<.0001
Females		Reference category	
Age			
35 years and over	15064.47	723.85	<.0001
25–34 years	10091.41	687.31	<.0001
15–24 years		Reference category	
Highest qualification before training			
Diploma and above	4912.37	905.81	<.0001
Certificate III/IV	4596.88	761.18	<.0001
Year 12	1451.60	690.70	0.0356
Year 11 and below or certificate I/II*		Reference category	
Employment status before training			
Employed full-time	15476.17	851.47	<.0001
Employed part-time	221.12	882.91	0.8022
Not working		Reference category	

Parameter	Estimate	Standard error	Pr > |t|
Match between the occupation before training and the intended occupation (at the two-digit level of ANZSCO)			
Already worked in the intended trade occupation before training	-5114.05	606.01	<.0001
Did not work in the intended trade occupation before training		Reference category	
Training qualification			
Diploma and above	3603.27	1103.96	0.0011
Certificate IV	6624.41	777.90	<.0001
Certificate III		Reference category	
Apprenticeship or traineeship			
Training was part of an apprenticeship or traineeship	2289.45	699.63	0.0011
Training was not part of an apprenticeship or traineeship		Reference category	
Socioeconomic status			
Low disadvantage	3737.41	598.42	<.0001
Average disadvantage	200.87	662.22	0.7616
High disadvantage		Reference category	
Location			
Major city	-4778.13	539.52	<.0001
Regional/remote area		Reference category	
n		7 267	
R-square		0.3442	

Note: * Includes miscellaneous education and did not go to school.

Table B5 Estimates from the logistic regression with respect to the probability of being employed after training (licensed trades and non-licensed trades)

Parameter	Estimate	Standard error	Pr > ChiSq
Intercept	-0.8702	0.0389	<.0001
Completion status			
Graduates	0.6122	0.0211	<.0001
Module completers		Reference category	
Trade area			
Licensed trades	0.1228	0.0451	0.0065
Non-licensed trades		Reference category	
Completion status by trade area			
Graduates in licensed trades	0.3922	0.0745	<.0001
Graduates in non-licensed trades	0	.	.
Module completers in licensed trades	0	.	.
Module completers in non-licensed trades		Reference category	
Sex			
Males	0.2302	0.0244	<.0001
Females		Reference category	
Age			
25–34 years	0.2281	0.0284	<.0001
35 years and over	0.2336	0.0277	<.0001
15–24 years		Reference category	
Highest qualification before training			
Year 12	0.3534	0.0253	<.0001
Certificate III/IV	0.6908	0.0299	<.0001
Diploma and above	0.8688	0.0361	<.0001
Year 11 and below or certificate I/II*		Reference category	
Employment status before training			
Employed part-time	1.6539	0.0280	<.0001
Employed full-time	1.8320	0.0271	<.0001
Not working		Reference category	
Match between the occupation before training and the intended occupation (at the two-digit level of ANZSCO)			
Already worked in the intended trade occupation before training	0.0474	0.0285	0.0967
Did not work in the intended trade occupation before training		Reference category	
Training qualification			
Certificate IV	0.2147	0.0290	<.0001
Diploma and above	-0.2581	0.0345	<.0001
Certificate III		Reference category	
Apprenticeship or traineeship			
Training was part of an apprenticeship or traineeship	0.7499	0.0269	<.0001
Training was not part of an apprenticeship or traineeship		Reference category	
Socioeconomic status			
Average disadvantage	0.1035	0.0260	<.0001
Low disadvantage	0.4156	0.0237	<.0001
High disadvantage		Reference category	
Location			
Major city	-0.5259	0.0223	<.0001
Regional/remote area		Reference category	
n		8 807	
Rescaled R-square		0.7954	

Note: * Includes miscellaneous education and did not go to school.

Table B6 **Estimates from the logistic regression with respect to the probability of having improved employment circumstances after training (licensed trades and non-licensed trades)**

Parameter	Estimate	Standard error	Pr > ChiSq
Intercept	-0.9410	0.0325	<.0001
Completion status			
Graduates	0.7052	0.0164	<.0001
Module completers		Reference category	
Trade area			
Licensed trades	0.1087	0.0343	0.0015
Non-licensed trades		Reference category	
Completion status by trade area			
Graduates in licensed trades	0.3947	0.0577	<.0001
Graduates in non-licensed trades	0	.	.
Module completers in licensed trades	0	.	.
Module completers in non-licensed trades		Reference category	
Sex			
Males	0.3004	0.0193	<.0001
Females		Reference category	
Age			
25–34 years	0.0690	0.0221	0.0018
35 years and over	-0.1086	0.0217	<.0001
15–24 years		Reference category	
Highest qualification before training			
Year 12	0.3099	0.0213	<.0001
Certificate III/IV	0.3057	0.0231	<.0001
Diploma and above	0.5043	0.0270	<.0001
Year 11 and below or certificate I/II*		Reference category	
Employment status before training			
Employed part-time	0.6170	0.0238	<.0001
Employed full-time	0.6568	0.0224	<.0001
Not working		Reference category	
Match between the occupation before training and the intended occupation (at the two-digit level of ANZSCO)			
Already worked in the intended trade occupation before training	0.0755	0.0197	0.0001
Did not work in the intended trade occupation before training		Reference category	
Training qualification			
Certificate IV	-0.0970	0.0213	<.0001
Diploma and above	-0.1606	0.0275	<.0001
Certificate III		Reference category	
Apprenticeship or traineeship			
Training was part of an apprenticeship or traineeship	1.0115	0.0209	<.0001
Training was not part of an apprenticeship or traineeship		Reference category	
Socioeconomic status			
Average disadvantage	0.0169	0.0203	0.4063
Low disadvantage	0.2720	0.0185	<.0001
High disadvantage		Reference category	
Location			
Major city	-0.2452	0.0169	<.0001
Regional/remote area		Reference category	
n		8 807	
Rescaled R-square		0.7048	

Note: * Includes miscellaneous education and did not go to school.

The returns to completion or partial completion of a qualification in the trades

Table B7 Estimates from the logistic regression with respect to the probability of being employed in the same occupation as training for graduates and module completers who are employed after training (licensed trades and non-licensed trades)

Parameter	Estimate	Standard error	Pr > ChiSq
Intercept	-1.3539	0.0502	<.0001
Completion status			
Graduates	0.9894	0.0242	<.0001
Module completers		Reference category	
Trade area			
Licensed trades	1.1662	0.0472	<.0001
Non-licensed trades		Reference category	
Completion status by trade area			
Graduates in licensed trades	-0.3799	0.0681	<.0001
Graduates in non-licensed trades	0	.	.
Module completers in licensed trades	0	.	.
Module completers in non-licensed trades		Reference category	
Sex			
Males	0.2759	0.0296	<.0001
Females		Reference category	
Age			
25–34 years	-0.0488	0.0303	0.1076
35 years and over	-0.6099	0.0320	<.0001
15–24 years		Reference category	
Highest qualification before training			
Year 12	-0.0978	0.0303	0.0012
Certificate III/IV	-0.1066	0.0350	0.0023
Diploma and above	0.3032	0.0398	<.0001
Year 11 and below or certificate I/II*		Reference category	
Employment status before training			
Employed part-time	-0.6627	0.0331	<.0001
Employed full-time	-1.4079	0.0326	<.0001
Not working		Reference category	
Match between the occupation before training and the intended occupation (at the two-digit level of ANZSCO)			
Already worked in the intended trade occupation before training	4.1376	0.0349	<.0001
Did not work in the intended trade occupation before training		Reference category	
Training qualification			
Certificate IV	-0.3093	0.0311	<.0001
Diploma and above	-0.8683	0.0470	<.0001
Certificate III		Reference category	
Apprenticeship or traineeship			
Training was part of an apprenticeship or traineeship	1.7742	0.0300	<.0001
Training was not part of an apprenticeship or traineeship		Reference category	
Socioeconomic status			
Average disadvantage	0.3351	0.0299	<.0001
Low disadvantage	0.2671	0.0262	<.0001
High disadvantage		Reference category	
Location			
Major city	-0.0147	0.0238	0.5373
Regional/remote area		Reference category	
n		7 418	
Rescaled R-square		0.9980	

Note: * Includes miscellaneous education and did not go to school.

Table B8 Estimates from the linear regression with respect to annual income for graduates and module completers who are employed after training (licensed trades and non-licensed trades)

Parameter	Estimate	Standard error	Pr > |t|
Intercept	17394.55	1235.38	<.0001
Completion status			
Graduates	1468.90	547.74	0.0073
Module completers		Reference category	
Trade area			
Licensed trades	5940.56	1105.73	<.0001
Non-licensed trades		Reference category	
Completion status by trade area			
Graduates in licensed trades	782.31	1482.02	0.5976
Graduates in non-licensed trades	0	.	.
Module completers in licensed trades	0	.	.
Module completers in non-licensed trades		Reference category	
Sex			
Males	14464.66	685.05	<.0001
Females		Reference category	
Age			
35 years and over	15424.51	732.15	<.0001
25–34 years	10124.56	697.48	<.0001
15–24 years		Reference category	
Highest qualification before training			
Diploma and above	5721.21	917.18	<.0001
Certificate III/IV	5028.79	770.72	<.0001
Year 12	1568.26	702.11	0.0255
Year 11 and below or certificate I/II*		Reference category	
Employment status before training			
Employed full-time	16567.20	859.10	<.0001
Employed part-time	304.70	897.02	0.7341
Not working		Reference category	
Match between the occupation before training and the intended occupation (at the two-digit level of ANZSCO)			
Already worked in the intended trade occupation before training	-5814.55	604.92	<.0001
Did not work in the intended trade occupation before training		Reference category	
Training qualification			
Diploma and above	5273.05	1013.62	<.0001
Certificate IV	7154.36	741.16	<.0001
Certificate III		Reference category	
Apprenticeship or traineeship			
Training was part of an apprenticeship or traineeship	2726.11	702.36	0.0001
Training was not part of an apprenticeship or traineeship		Reference category	
Socioeconomic status			
Low disadvantage	3399.66	607.75	<.0001
Average disadvantage	27.58	671.64	0.9673
High disadvantage		Reference category	
Location			
Major city	-4888.94	546.80	<.0001
Regional/remote area		Reference category	
n		7 267	
R-square		0.3202	

Note: * Includes miscellaneous education and did not go to school.

Appendix C: Outcome estimates

Table C1 Module completers in intended occupations by employment status before training and highest qualification prior to training (unweighted)

Intended occupation	Already worked in the intended occupation with certificate III and above before training	Total module completers	Percentage of module completers already working in the intended occupation with certificate III and above before training
	n	n	%
Engineering, ICT and science technicians	28	456	6.1
Automotive and engineering trades workers	114	554	20.6
Construction trades workers	27	161	16.8
Electrotechnology and telecommunications trades workers	48	212	22.6
Food trades workers	39	303	12.9
Skilled animal and horticultural workers/other technicians and trades workers	24	469	5.1
Licensed trades	43	204	21.1

Source: NCVER, Student Outcomes Survey, 2013.

Table C2 Statistics for predicted probabilities for graduates and module completers by six sub-major intended occupations

Outcome by trade area	Estimate	Standard error	Pr > ChiSq
Probability of being employed after training			
Graduates			
Engineering, ICT and science technicians	0.34	0.0110	<.0001
Automotive and engineering trades workers	0.58	0.0140	<.0001
Construction trades workers	0.71	0.0139	<.0001
Electrotechnology and telecommunications trades workers	0.59	0.0181	<.0001
Food trades workers	0.47	0.0156	0.0401
Skilled animal and horticultural workers/other technicians and trades workers	0.38	0.0103	<.0001
Module completers			
Engineering, ICT and science technicians	0.27	0.0104	<.0001
Automotive and engineering trades workers	0.29	0.0099	<.0001
Construction trades workers	0.41	0.0148	<.0001
Electrotechnology and telecommunications trades workers	0.39	0.0150	<.0001
Food trades workers	0.31	0.0103	<.0001
Skilled animal and horticultural workers/other technicians and trades workers	0.32	0.0096	<.0001
Probability of having improved employment circumstances after training			
Graduates			
Engineering, ICT and science technicians	0.30	0.0085	<.0001
Automotive and engineering trades workers	0.58	0.0111	<.0001
Construction trades workers	0.60	0.0123	<.0001
Electrotechnology and telecommunications trades workers	0.60	0.0143	<.0001
Food trades workers	0.54	0.0131	0.0009
Skilled animal and horticultural workers/other technicians and trades workers	0.39	0.0087	<.0001
Module completers			
Engineering, ICT and science technicians	0.21	0.0072	<.0001
Automotive and engineering trades workers	0.28	0.0080	<.0001
Construction trades workers	0.34	0.0110	<.0001
Electrotechnology and telecommunications trades workers	0.35	0.0112	<.0001
Food trades workers	0.34	0.0091	<.0001
Skilled animal and horticultural workers/other technicians and trades workers	0.27	0.0073	<.0001
Probability of being employed in the same occupation as training for graduates and module completers who are employed after training			
Graduates			
Engineering, ICT and science technicians	0.36	0.0142	<.0001
Automotive and engineering trades workers	0.53	0.0156	0.0721
Construction trades workers	0.67	0.0154	<.0001
Electrotechnology and telecommunications trades workers	0.64	0.0167	<.0001
Food trades workers	0.52	0.0177	0.1887
Skilled animal and horticultural workers/other technicians and trades workers	0.37	0.0127	<.0001
Module completers			
Engineering, ICT and science technicians	0.16	0.0101	<.0001
Automotive and engineering trades workers	0.33	0.0136	<.0001
Construction trades workers	0.43	0.0174	<.0001
Electrotechnology and telecommunications trades workers	0.56	0.0180	0.0005
Food trades workers	0.24	0.0111	<.0001
Skilled animal and horticultural workers/other technicians and trades workers	0.14	0.0073	<.0001

Table C3 Statistics for predicted average annual income after training for graduates and module completers who are employed after training by six sub-major intended occupations

Outcome by trade area	Estimate	Standard error	Pr > |t|
Average annual income after training			
Graduates			
Engineering, ICT and science technicians	45 406	890.48	<.0001
Automotive and engineering trades workers	51 045	942.64	<.0001
Construction trades workers	46 056	1058.94	<.0001
Electrotechnology and telecommunications trades workers	56 436	1187.10	<.0001
Food trades workers	38 613	1294.53	<.0001
Skilled animal and horticultural workers/other technicians and trades workers	39 197	876.75	<.0001
Module completers			
Engineering, ICT and science technicians	50 152	1066.93	<.0001
Automotive and engineering trades workers	43 953	921.55	<.0001
Construction trades workers	42 190	1305.60	<.0001
Electrotechnology and telecommunications trades workers	49 855	1167.13	<.0001
Food trades workers	38 201	1142.39	<.0001
Skilled animal and horticultural workers/other technicians and trades workers	43 694	858.38	<.0001

Table C4 Statistics for predicted probabilities for graduates and module completers by licensed trades and non-licensed trades

Outcome by trade area	Estimate	Standard error	Pr > ChiSq
Probability of being employed after training			
Graduates			
Licensed trades	0.56	0.0176	0.0003
Non-licensed trades	0.44	0.0095	<.0001
Module completers			
Licensed trades	0.32	0.0131	<.0001
Non-licensed trades	0.30	0.0081	<.0001
Probability of having improved employment circumstances after training			
Graduates			
Licensed trades	0.57	0.0140	<.0001
Non-licensed trades	0.44	0.0080	<.0001
Module completers			
Licensed trades	0.30	0.0100	<.0001
Non-licensed trades	0.28	0.0066	<.0001
Probability of being employed in the same occupation as training for graduates and module completers who are employed after training			
Graduates			
Licensed trades	0.60	0.0170	<.0001
Non-licensed trades	0.41	0.0118	<.0001
Module completers			
Licensed trades	0.45	0.0171	0.0064
Non-licensed trades	0.21	0.0082	<.0001

Table C5 Statistics for predicted average annual income after training for graduates and module completers who are employed after training by licensed trades and non-licensed trades

Outcome by trade area	Estimate	Standard error	Pr > |t|
Average annual income			
Graduates			
Licensed trades	51 335	1110	<.0001
Non-licensed trades	44 612	569	<.0001
Module completers			
Licensed trades	49 084	1143	<.0001
Non-licensed trades	43 143	582	<.0001

💲 NVETR Program funding

The National Vocational Education and Training Research (NVETR) Program is coordinated and managed by NCVER on behalf of the Australian Government and state and territory governments. Funding is provided through the Australian Government Department of Education and Training.

The NVETR Program is based on national research priorities and aims to improve policy and practice in the VET sector. The research effort itself is collaborative and requires strong relationships with the research community in Australia's universities and beyond. NCVER may also involve various stakeholders, including state and territory governments, industry and practitioners, to inform the commissioned research, and use a variety of mechanisms such as project roundtables and forums.

Research grants are awarded to organisations through a competitive process, in which NCVER does not participate. To ensure the quality and relevance of the research, projects are selected using an independent and transparent process and research reports are peer-reviewed.

From 2012 some of the NVETR Program funding was made available for research and policy advice to National Senior Officials of the then Standing Council for Tertiary Education, Skills and Employment (SCOTESE) Principal Committees. They were responsible for determining suitable and relevant research projects aligned to the immediate priority needs in support of the national VET reform agenda.

For further information about the program go to the NCVER Portal <http://www.ncver.edu.au>.