



LONGITUDINAL SURVEYS OF AUSTRALIAN YOUTH
RESEARCH REPORT 58

The vocational equivalent to Year 12

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National Centre for Vocational Education Research



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About the research

The vocational equivalent to Year 12

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Government policies that promote Year 12 completion are based on a recognition that, on average, the completion of senior secondary schooling leads to better labour market outcomes. Completing senior secondary schooling is not, however, for everyone, particularly not for those who are less academically inclined or who are unsuited to the institutionalised nature of schools. Given this, it makes sense to talk about a vocational equivalent to senior secondary schooling.

In this paper, Lim and Karmel investigate the notion of a vocational equivalent to Year 12 completion in terms of the volume of learning, the educational complexity of courses, and ultimately labour market and other outcomes (various aspects of employment, satisfaction with aspects of life and further study). In relation to the last of these, their idea is that qualifications are equivalent if they have similar outcomes.

In determining the equivalence of outcomes, Lim and Karmel use the Longitudinal Surveys of Australian Youth (LSAY) to compare the outcomes, by age 25, of alternative educational pathways with those of completion of senior secondary schooling. Rather than compare the outcomes of vocational alternatives with all those completing Year 12, they restrict their comparison to those completing Year 12 with either no tertiary education rank (TER) or in the lower half of the TER distribution. This acknowledges that alternative pathways are typically suggested for the less academically inclined.

Key messages

- In terms of volume of learning, certificate IIs are not equivalent to Year 12; certificate IIIs remain in contention.
- In relation to educational outcomes, the language of the qualifications frameworks points to vocational qualifications being different from the senior secondary certificate. This difference is also highlighted by the competency-based assessment used in the vocational sector.
- For males, all pathways (including early school leaving with no further VET study) are equivalent to Year 12 completion vis-a-vis labour market outcomes. Thus in this context the notion of equivalence has no meaning.
- For females, certificate IIIs – but not certificate IIs – are equivalent to Year 12 completion in terms of full-time employment or being in full-time employment or study.
- In terms of further study outcomes, it is clear that there is no vocational equivalent to completing senior secondary schooling.

These findings challenge the notion of a vocational equivalent for Year 12 completion. Vocational pathways must be considered an alternative rather than a literal equivalent. If a 'vocational equivalent' is required for rhetorical purposes, it should be at least at certificate III level.

Tom Karmel
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Contents

Tables and figures	6
Executive summary	8
Introduction	11
Volume of learning	13
Course attributes	15
The equivalence of outcomes	21
Data and descriptive statistics	21
Statistical methodology	23
Results	24
Concluding comments	27
References	28
Appendices	
A: International frameworks	29
B: Details of outcome variables	33
C: Propensity score regression	38
D: Regression results	41

Tables and figures

Tables

1	Nominal hours of various qualifications	13
2	Summary of hours for Year 12 completion by jurisdiction	13
3	Example of use of Victorian Credit Matrix	14
4	AQF qualification type descriptors	16
5	Draft AQF level summaries and criteria	17
6	Example of use of Victorian Credit Matrix	18
7	ISCED classifications	19
8	ASCED qualification levels	19
9	List of qualification levels compared	22
10	Age and year concordance between 1995 and 1998 cohorts	22
11	Qualification level completed by age 21 (measured at age 25)	23
12	Summary of Year 12 equivalence for all outcomes for males (at age 25)	25
13	Summary of Year 12 equivalence for all outcomes for females (at age 25)	25
B1	Occupational categories and occupational prestige measures	34
B2	Summary statistics of qualification levels by various outcomes: part 1	37
B3	Summary statistics of qualification levels by various outcomes: part 2	37
C1	Model fit statistics for propensity score regression	38
C2	Model estimates from propensity scores regression	39
C3	Score statistics from propensity scores regression	39
C4	Distribution of not completing Year 12, with and without propensity score weights	40
D1	Tests of fixed effects for full-time employment (at age 25)	41
D2	Parameter estimates for logistic regression on full-time employment (at age 25)	42
D3	Test of fixed effect for females in part-time employment (at age 25)	43
D4	Parameter estimates for logistic regression for females in part-time employment (at age 25)	43
D5	Tests of fixed effects for full-time engagement (at age 25)	44
D6	Parameter estimates for logistic regression on full-time engagement (at age 25)	45
D7	Tests of fixed effects for occupational prestige for those working full-time (at age 25)	46
D8	Parameter estimates for logistic regression on occupational prestige for those working full-time (at age 25)	46

D9 Test of fixed effect for occupational prestige for females working part-time (at age 25)	48
D10 Parameter estimates for logistic regression on occupational prestige for females working part-time (at age 25)	48
D11 Tests of fixed effects for gross weekly wage for those employed full-time (at age 25)	49
D12 Parameter estimates for regression on gross weekly wage for those employed full-time (at age 25)	49
D13 Test of fixed effect for gross weekly wage for females working part-time (at age 25)	50
D14 Parameter estimates for logistic regression on gross weekly wage for females working part-time (at age 25)	50
D15 Tests of fixed effects for whether undertook further study at diploma or higher level (by age 25)	51
D16 Parameter estimates for logistic regression on whether undertook further study at diploma or higher level (by age 25)	51

Figures

A1 ISCED level structure	31
D1 Probability of being in full-time employment at age 25 by gender and qualification level	43
D2 Predicted probabilities of part-time employment for females who are not studying by qualification at age 25	44
D3 Probability of being full-time engaged at age 25 by gender and qualification level	46
D4 Predicted means of occupational prestige by qualification level and gender at age 25	47
D5 Predicted occupational prestige score by qualification level: females working part-time at age 25	48
D6 Gross weekly wage by qualification level and gender for full-time workers at age 25	50
D7 Gross weekly wage by qualification level: females working part-time at age 25	51
D8 Predicted probability of undertaking further study at diploma level or higher by qualification level obtained and gender by age 25	52

Executive summary

The concept of a vocational equivalent to completing a senior school certificate (denoted by the completion of Year 12) has been a feature of recent government policy; for example, it features in the Adelaide Declaration goals:

All students have access to the high quality education necessary to enable the completion of school education to Year 12 or its vocational equivalent and that provides clear and recognised pathways to employment and further education and training.

(Ministerial Council on Employment, Education, Training and Youth Affairs 1999, Goal 3.6)

The Council of Australian Governments (COAG) Meeting in Hobart on 30 April 2009 similarly agreed to the following attainment targets, all incorporating the notion of a vocational equivalent to Year 12.

COAG agreed as well that the most appropriate measure of the 90 per cent Year 12 or equivalent attainment rate target is:

- for 2015, the proportion of young people in the 20–24 year old age group who have achieved Year 12 or a certificate II or above as measured by the Australian Bureau of Statistics Survey of Education and work; and
- for 2020, the proportion of young people in the 20–24 year old age group who have achieved Year 12 or a certificate III or above as measured by the Australian Bureau of Statistics Survey of Education and Work.

Increased Year 12 completion is being targeted because it is recognised that completion of senior secondary schooling leads to better labour market outcomes than non-completion. However, it is also recognised that an academic path is not for everyone and this has led to a realisation that there should be alternatives to Year 12 completion. For example, Dockery (2005), amongst others, highlighted that completing Year 12 may not be the right pathway for all young people, particularly for those who are less academically inclined or who are unsuited to the institutionalised nature of schools. The idea of a vocational equivalent to Year 12 is a response to this.¹

While the Council of Australian Governments has designated certificate II as the vocational equivalent to Year 12, little work has been undertaken to establish an empirical underpinning for the equivalence. Further, it is interesting to note that the vocational equivalent to Year 12 will change from certificate II in 2015 to certificate III in 2020.

The purpose of this paper is to investigate what might be the vocational equivalent to Year 12.

We argue that there are three dimensions that could be considered: volume of learning; attributes; and outcomes. The paper looks at each of these in turn.

We find that a Year 12 qualification has nominal hours greater than those of an Australian Qualifications Framework (AQF) level II qualification, with hours that align more closely to those of an AQF level III qualification. From this perspective a certificate II does not look like a likely candidate to be an equivalent to Year 12 completion.

¹ In fact the setting of Year 12 or equivalent targets has been Australian Government policy since the early 1990s when the Finn Review (1991) recommended that, by 2001, 95% of 19-year-olds be participating in or have completed Year 12 or its equivalent level in vocational training.

The second dimension of a qualification is course attributes. The complexity of the subjects and the expected learning outcomes from completing the qualification comprise the attributes of a qualification. In the Australian context, the draft descriptors arising from the recent review² of the AQF define the aim of Year 12 as providing a basic preparation for civic and working life and a foundation for lifelong learning. This is quite different from those relating to vocational certificates, which are less broad and more focused on the world of work. Thus course descriptors do not provide a useful basis from which to draw equivalences.

These general descriptors can be moderated by the degree of complexity. Complexity is generally measured through a system characterised by various levels, such as the Victorian Credit Matrix. While systems such as these have the capacity to provide a very precise characterisation of qualifications, it is not obvious how they could be used practically to define broad equivalence across qualifications.

The third dimension is that of outcomes: we would define two qualifications to be equivalent if they had similar outcomes. Such an approach begs the question of the nature of the outcomes and the age at which the outcomes are realised. The Adelaide Declaration's 'clear and recognised pathways to employment and further education and training' provide straightforward guidance here, and we focus on a range of labour market and further study outcomes. Specifically, we consider:

- full-time employment
- full-time engagement (full-time study, full-time work or part-time work and study)
- occupational prestige (measured using the Australian National University's scales of occupational prestige)
- gross weekly wages for those in full-time employment
- further study at diploma or higher level. This level of further study is chosen because it is the level to which Year 12 typically provides entry.

Gender differences play a significant role in outcomes, since more females may choose to work part-time due to caring or family responsibilities. For females, therefore, further consideration is given to whether or not they are in part-time employment; occupational prestige and wages are measured for females who are working part-time (and not studying).

Our choice of an age at which outcomes are measured is purely pragmatic. Our analysis of outcomes uses data from the Longitudinal Surveys of Australian Youth (LSAY). Ideally, we would measure outcomes over an individual's adult working life. LSAY, however, follows individuals until they are 25 years, so this is our choice. By this age, however, most young people have made the transition to adulthood.

One of the issues in determining equivalence is that Year 12 or a senior secondary certificate spans a very broad spectrum of difficulty in subject matter and in the ability of students.³ To compare the outcomes of those undertaking vocational studies with highly academic students would load the dice too much against the former. Therefore it would not be appropriate to include all those who had completed Year 12 in the comparison group. After all, there are very large differences between those at the top of the academic achievement distribution and those at the bottom. The notion of an equivalent to Year 12 is directed towards those less academically inclined, and therefore this latter group provides a sensible comparator. To be precise, our comparator group consists of all those

² <<http://www.aqf.edu.au/Portals/0/Revised%20tables%20V6%209%20February%202010%20FINAL.pdf>>.

³ It is interesting to note that the senior secondary certificate spans a number of levels in the qualification frameworks of both South Africa and Ireland. More details on the frameworks of other countries appear in appendix A.

students who have completed Year 12, but either did not obtain a tertiary entrance rank (TER) score or obtained a TER score in the lower half of the distribution. To further ensure that the comparisons are fair, we weight the data to ensure that the comparison groups have a similar distribution of background characteristics.

Our general conclusion is that the concept of equivalence is problematic. In terms of volume of learning, certificate IIs are ruled out, while certificate IIIs remain in contention. From the point of view of attributes, the language of qualification frameworks points to vocational qualifications being different from the senior secondary certificate. Our analysis of outcomes is also unhelpful in defining equivalence. For males, all pathways (including early school leavers without further VET study) are equivalent to Year 12 completion in relation to labour market outcomes, while no vocational pathway is equivalent to Year 12 completion in terms of further study. Year 11 plus an apprenticeship is superior to Year 12 in terms of wages for full-time workers. For females the picture is a little more useful. While the pathway does not affect all labour market outcomes, certificate IIIs – but not certificate IIs – are equivalent in terms of full-time employment or being in full-time employment or full-time study. The picture for further study is the same as for males, in that there is no vocational equivalent to Year 12 completion.

There is a place for a vocational alternative (which would have to be at least a certificate III) to the completion of Year 12, since the lack of an alternative might deny opportunities to those who are not academically inclined, particularly in light of the national participation requirements (Council of Australian Governments 2009), which stipulate that individuals must be in education, training or employment until the age of 17. That said, vocational qualifications must be considered as an alternative rather than a literal equivalent. In this context, the term 'equivalence' becomes a useful rhetorical device rather than a precise concept. But the 'equivalent' vocational qualification should be at the certificate III level, not certificate II.

Introduction

The concept of a vocational equivalent to the completion of a senior school certificate (denoted by the completion of Year 12) has been a feature of recent government policy; for example, it features in the Adelaide Declaration goals:

All students have access to the high quality education necessary to enable the completion of school education to Year 12 or its vocational equivalent and that provides clear and recognised pathways to employment and further education and training.

(Ministerial Council on Employment, Education, Training and Youth Affairs 1999, Goal 3.6)

The Council of Australian Governments Meeting (COAG) in Hobart on 30 April 2009 similarly agreed to the following attainment targets, all incorporating the notion of a vocational equivalent to Year 12:

COAG agreed as well that the most appropriate measure of the 90 per cent Year 12 or equivalent attainment rate target is:

- for 2015, the proportion of young people in the 20–24 year old age group who have achieved Year 12 or a certificate II or above as measured by the Australian Bureau of Statistics Survey of Education and work; and
- for 2020, the proportion of young people in the 20–24 year old age group who have achieved Year 12 or a certificate III or above as measured by the Australian Bureau of Statistics Survey of Education and Work.

Increased Year 12 completion is being targeted because it is recognised that completion of senior secondary schooling results in better labour market outcomes than non-completion. However, it is also recognised that an academic path is not for everyone and this has led to a realisation that there should be alternatives to Year 12 completion. For example, Dockery (2005), amongst others, highlighted that completing Year 12 may not be the right pathway for all young people, particularly those who are less academically inclined or who are unsuited to the institutionalised nature of schools. The idea of a vocational equivalent to Year 12 is a response to this.⁴

While COAG has designated certificate II as the vocational equivalent to Year 12, little work has been undertaken to establish an empirical underpinning for the equivalence. Further, it is interesting to note that the vocational equivalence to Year 12 will change from certificate II in 2015 to certificate III in 2020. Furthermore, Australian and international classifications provide no simple answer. The Australian Bureau of Statistics (ABS) largely dodges the issue by classifying educational attainment by the highest level of non-school qualification, although under the Australian Standard Classification of Education (ASCED) all certificates are ranked below the completion of Year 12. By contrast, the International Standard Classification of Education (ISCED) ranks certificate III and the senior school certificate at the same level. This is further complicated by the fact that some qualification frameworks (for example, those of South Africa and Ireland) allow the senior secondary certificate to span a number of levels.

The purpose of this paper is to investigate what might be the vocational equivalent to Year 12.

⁴ In fact the setting of Year 12 or equivalent targets has been Australian Government policy since the early 1990s when the Finn Review (1991) recommended that, by 2001, 95% of 19-year-olds be participating in or have completed Year 12 or its equivalent level in vocational training.

We argue that there are three dimensions that could be considered: volume of learning; attributes; and outcomes. The paper takes each of these in turn.

By volume of learning we mean the amount of time normally taken to complete a qualification. The completion of Year 12 typically takes a full year of study after completing Year 11. By course attributes we mean the complexity of the subjects and the expected learning outcomes from completing the qualification. Finally, outcomes refer to what graduates achieve subsequent to their studies, specifically, employment outcomes, satisfaction with various aspects of life and the undertaking of further study. In our comparisons of outcomes we use statistical models to take into account that the students undertaking vocational certificates have characteristics different from those completing Year 12. Further, to ensure a fair comparison, we use as our comparator group those Year 12 completers whose TER score is in the bottom 50% or who do not have a TER score at all. It is this group for which a vocational alternative is a realistic option.

The paper ends with some final comments.

Volume of learning

Volume of learning is relatively easy to measure for vocational qualifications and can be undertaken by identifying the nominal hours of each subject within a qualification. Table 1 presents the minimum, median and maximum nominal hours for different qualification levels as reported in the National Centre for Vocational Education Research (NCVER) VET Provider Collection.

Table 1 Nominal hours of various qualifications

Qualification level	Median nominal hours	Minimum	Maximum
Graduate diploma	720	475	975
Graduate certificate	360	180	520
Advanced diploma	1390	42	4300
Diploma	1030	15	3500
Certificate IV	614	2	2275
Certificate III	623	5	3088
Certificate II	384	2	1663
Certificate I	300	5	1853
Non-award courses	18	1	2960
Statement of attainment	80	2	2563
Bridging and enabling courses	24	1	2400
Not elsewhere classified	16	1	4200

Source: NCVER VET Provider Collection (using weighted median methodology as endorsed at NTSC meeting, 18 March 2010, agenda item 4.0).

Table 2 presents the hours required to complete the Year 12 components of the senior school certificates for each jurisdiction.

Table 2 Summary of hours for Year 12 completion by jurisdiction

Jurisdiction	Qualification	Hours to complete*
Victoria	VCE/CAL	550
New South Wales	HSC	600–720
Queensland	QCE	550–660
South Australia/Northern Territory	SACE/NTCE	500–625
Western Australia	WACE	550
Tasmania	TCE	600
Australian Capital Territory	Year 12 certificate	990, 55 hours per unit

Note: * For the Year 12 (Stage 2) component of the qualification.

There are some variations, but, generally, Year 12 (senior school certificate) completions are the equivalent of two years full-time study, with yearly hours ranging from 500 to 720, depending upon student choice and jurisdiction. If we consider the second stage of the senior secondary certificates alone, then these hours are broadly equivalent on average to the contact hours required for undertaking a certificate III and are substantially more than those required for certificates I and II. Thus, from a volume of learning perspective, Year 11 followed by a certificate III or IV is roughly equivalent to Year 12, but Year 11 followed by a certificate II is not. On the other hand, Year 11 followed by a certificate I and a certificate II gets closer. However, this simple arithmetic is based on median nominal hours. If we look at the range of hours with qualification levels, then the concept of

equivalence through the volume of learning becomes very problematic. For example, hours for a certificate III range from five to 3088 hours.

Volume of learning can also be measured using a points-based system. For example, the Victorian Government introduced the Victorian Credit Matrix (Victorian Registration and Qualifications Authority 2008a). The credit matrix assigns points to subjects/modules, whereby a point denotes the amount of learning time expected in a particular subject. One point equals ten hours of 'average designed learning time'. The credit matrix provides a common basis for comparing different volumes of learning and allows individuals to compare learning within and between the education and training sectors (Victorian Registration and Qualifications Authority 2008a). While there is considerable variation across various courses, it appears that the Victorian Certificate of Education, in which considerable amounts of VET can be embedded, is assigned considerably more points than certificates at either the second or third levels (table 3). Thus, according to the Victorian Credit Matrix, vocational certificates are not equivalent to the senior secondary certificate.

Table 3 Example of use of Victorian Credit Matrix

Qualification	Points (volume)
VCE	
Business	96
Business (with VET options)	93
Mixed-eclectic	96
Service vocational (with VET topics)	94
VET	
Cert. II in Business	43
Cert. III in Business	52
Cert. II in Retail	39
Cert. III in Retail	37 or 63*

Note: * This has prerequisite components, and the 63 points include the points earned in undertaking these prerequisites.

Investigating how each jurisdiction applies VET credit transfers (volume of study) to their senior secondary certificates potentially provides another way to determine the vocational equivalences of senior secondary certificates, according to 'volume'. However, given the vast differences between jurisdictions in the application of VET in Schools, such an exercise is almost impossible. For example, these arrangements are often aligned to industry or particular areas of study rather than to particular certificate levels and so within jurisdictions there is an inconsistent application of credit transfer based simply on certificate level.

Course attributes

A second approach is to focus on educational attributes, notably course complexity and learning outcomes. Course complexity is traditionally measured using a levels system. Learning outcomes refer to the knowledge and skills that can be obtained by undertaking a course of study.

In the Australian context, the Australian Qualifications Framework (AQF) provides the framework by which all qualification levels are described. The framework is divided into three separate streams, one for each of the educational sectors. There is only one qualification within the schools sector, and that is the senior secondary certificate of education.

Where does Year 12 sit in relation to other qualifications? Here, it is possible to compare the AQF descriptors for senior secondary certificates and certificates level II and III. Table 4 sets out the descriptors for the senior secondary certificate, certificate I and certificate II according to the Australian Qualifications Framework Council's proposed new descriptors.⁵

From these descriptors, it can be observed that the senior secondary certificate is a broader qualification, implying deeper specialist knowledge in some areas, and is less focused on vocational outcomes when compared with certificates II and III. The aim of Year 12 is to provide a basic preparation for civic and working life and a foundation for lifelong learning, the aims of which are different from the vocational qualifications.

Further, in the context of applying skills and knowledge, the senior secondary certificate has fairly generic descriptors when compared with those of certificates II and III. Within the vocational frameworks, certificate III provides more in-depth knowledge and a greater application of skills. However, these descriptors are quite general and cover a large range of more specific qualifications.

From table 4, it is clear that the VET qualifications have purposes different from the senior school certificates, which is confirmed by the different approaches to assessment and learning paradigms. The VET sector has outcomes that are based predominantly on a competency-based approach to training. Assessment is designed to ensure that individuals have the specific skills (competencies) and related generic skills suitable for employment in a given industry or occupation. School (Year 12) has a much broader purpose: providing the generic skills needed for post-school activities such as employment, further education or training and participation in society. These skills are assessed using a grading scale based on continuous assessment over the life of the course. In particular, Year 12 subjects have assessments which are set and marked or moderated by an independent body (the upper secondary assessment authority in each state), as opposed to the VET sector, which uses up-front specification of the standards and scope that apply to each unit of competency and a general requirement that assessors have a minimum qualification level (Certificate IV in Training and Assessment, or equivalent). External assessment or validation in the VET sector is only used in a few licensed trade areas.

⁵ The AQFC is currently undertaking a review of the current AQF to determine a way to better align learning outcomes, complexity and volume of learning as a way of ensuring comparability between qualifications within the framework. As part of this review, the qualification descriptors have been submitted to MCTEE for approval (19 November 2010); see <<http://www.aqf.edu.au/Portals/0/Documents/The%20Australian%20Qualifications%20Framework%20for%20MCTEE%20approval%2019%20Nov%202010.pdf>>, viewed February 2011.

Table 4 AQF qualification type descriptors

Qualification	Senior secondary certificate of education	Certificate II	Certificate III
Purpose Graduates of the qualification type will have ...	To qualify individuals with a solid foundation in knowledge, skills and values for further learning, to undertake work and participate in civic life	To qualify individuals for mainly routine work and as a pathway to further learning	To qualify individuals who apply a broad range of knowledge and skills in varied contexts to enter skilled work and/or as a pathway for further learning
Knowledge	Factual, technical, procedural and some theoretical knowledge of a specific area of work and learning	Basic factual, technical and procedural knowledge in defined areas of work and learning	Factual, technical, procedural and theoretical knowledge in an area of work and learning
Skills	<p>General capabilities that underpin flexible and analytical thinking, including literacy and numeracy, a capacity to work with others and an ability to move across subject disciplines to develop new expertise</p> <p>Cognitive skills to access, record and act on information from varied sources and literacy and numeracy appropriate to subject disciplines</p> <p>Cognitive, technical communication and creative skills for particular disciplines and to integrate disciplines and solve problems and work with others</p> <p>Literacy and communication skills, including everyday reading, writing skills and using information communication technologies skills to present knowledge and ideas to others</p>	<p>Cognitive skills to access, record and act on a defined range of information from varied sources</p> <p>Cognitive and communication skills to apply and communicate known solutions to a limited range of predictable problems</p> <p>Technical skills to use a limited range of equipment to complete tasks involving known routines and procedures with a limited range of options</p>	<p>Cognitive, technical and communication skills to interpret and act on available information</p> <p>Cognitive and communication skills to apply and communicate known solutions to a variety of predictable problems and to deal with unforeseen contingencies using known solutions</p> <p>Technical and communication skills to provide technical information to a variety of specialist and non-specialist audiences</p> <p>Technical skills to undertake routine and non-routine tasks in a range of skills operations</p>
Application – knowledge and skills are applied to demonstrate ...	<p>Application of knowledge and skills:</p> <ul style="list-style-type: none"> ▪ with depth in some areas to tasks or functions in known or changing contexts ▪ in particular contexts within civic life, work and lifelong learning as successful learners, confident individuals and team members and active and informed citizens ▪ in contexts that include taking individual responsibility with some direction and some accountability for the quality of outcomes 	<p>Application of knowledge and skills:</p> <ul style="list-style-type: none"> ▪ with accountability for the quality of own outcomes and responsibility for own outputs in work and learning ▪ with limited autonomy and judgment in the completion of own defined and routine tasks in known and stable contexts and the completion of less routine and more variable tasks in collaboration with others ▪ in a team environment 	<p>Application of knowledge and skills:</p> <ul style="list-style-type: none"> ▪ with discretion and judgment in the selection of equipment, services or contingency measures ▪ adapting and transferring skills and knowledge within known routines, methods, procedures and time constraints ▪ in contexts that may include taking responsibility for own outputs in work and learning including participation in teams
Notional duration of student learning in full-time equivalent years	2 years	0.5–1 year Note: qualifications at this level will cater for the needs of diverse groups of students, some of whom may take longer to complete the qualifications	1–2 years Note: There may be variations at this level in duration based on full-time institution-based study compared with trade training involving both on- and off-the-job structured learning

Source: <<http://www.aqf.edu.au/Portals/0/Documents/The%20Australian%20Qualifications%20Framework%20for%20MCTEE%20approval%2019%20Nov%202010.pdf>>, viewed February 2011.

It is difficult to align school outcomes with those of the VET sector because they are based on a different set of learning paradigms.

The second attribute of a qualification is that of complexity of learning. The current AQF implementation does not provide any guidance on the complexity of training or education. The current AQF review is proposing to introduce levels of learning and broad-level learning outcome

descriptors. The draft AQF tables introduce ten different levels to describe the complexity of learning and the expected learning outcomes for courses within each of these levels.

Table 5 Draft AQF level summaries and criteria⁶

AQF level	Level summary – graduates at this level have:	Proposed qualification(s)
1	Knowledge and skills for initial work, community involvement and for further learning	Certificate I
2	Knowledge and skills for work in a defined context and for further learning	Certificate II
3	Knowledge and skills for skilled work and for further learning	Senior secondary schooling/ Certificate III
4	Theoretical and practical knowledge and skills for specialised and/or skilled work and for further learning	Certificate IV
5	Specialised knowledge and skills for skilled/paraprofessional work and for further learning	Diploma
6	Comprehensive knowledge and skills for paraprofessional/highly skilled work and for further learning	Advanced diploma/ associate degree
7	Systematic and coherent knowledge and skills for professional work and for further learning	Bachelor degree
8	Advanced specialised knowledge and skills for professional or highly skilled work and for further learning	Bachelor honours degree/ graduate certificate/ vocational graduate Certificate/graduate diploma/ Vocational graduate diploma
9	Mastery of complex specialised knowledge and skills for research, professional practice and for further learning	Master's degree (research)/masters degree (other)
10	Substantial original contribution to knowledge in a field or learning and research for professional practice and for further learning	Doctoral degree (research)/doctoral degree (other)

These levels could be applied to whole qualifications or subjects within qualifications in order to determine the equivalence of Year 12 to other qualifications. Discussion is taking place about the assignment of qualifications to descriptors at specific levels, in particular, whether current senior school certificates should span a range of levels. If we take table 5 at face value, both the senior secondary school certificate and certificate III are at level 3: 'Graduates have knowledge and skills for skilled work and for further learning'. One obvious difficulty is that this descriptor is so broad that it provides little definition.

A neat way of classifying qualifications in terms of complexity and inputs would be to assign each module/subject of a qualification a level (as given for example in table 5) and a measure of the amount of learning time required by that module. The Victorian Government has attempted to measure both complexity and volume of learning for all subjects and courses through the Victorian Credit Matrix (Victorian Registration and Qualifications Authority 2008a). The credit matrix uses eight levels (there is also an enabling level) to describe the complexity of the learning outcomes required by a subject.⁷

⁶ <<http://www.aqf.edu.au/Portals/0/Revised%20tables%20V6%209%20February%202010%20FINAL.pdf>>, viewed March 2010.

⁷ There are a number of examples of this approach. The European Qualifications Framework consists of eight levels, in which each level has a descriptor covering knowledge, skills and competence. The Scottish Qualifications Framework has 12 levels, from access courses to doctorates, with learning outcomes covering the complexity and depth of knowledge and understanding; links to associated academic, vocational or professional practice; the degree of integration, independence and creativity required; the range and sophistication of application/practice; and the role(s) taken in relation to other learners/workers in carrying out tasks (<<http://www.scqf.org.uk/TheFramework/SCQF-Level-Descriptors.aspx?>> viewed December 2010).

The use of the credit matrix to classify qualifications follows a 12-step process as described in the credit matrix guidelines (Victorian Registration and Qualifications Authority 2008b). However, the Victorian authority has assigned levels and points to a wide range of qualifications, including the Victorian Certificate of Education (VCE) and many certificate-level qualifications.⁸ Levels are assigned based on the complexity of the learning outcomes, which are determined by:

- the kind of knowledge and skills involved
- the kinds of issues or problems that the knowledge and skills are applied to
- the amount of independence, self-organisation or organisation of others that is required to solve problems or complete tasks.

The Victorian Credit Matrix can be used to compare selected Year 12 and vocational courses according to their learning outcomes and volume of learning. This matrix is only applicable to Victorian subjects, and it is worth noting that all Victorian Certificate of Education subjects have the same level (3) and credit points, but these certificates can vary up or down in their total points through the selection of VET options. Table 6 adds the level to table 3 presented earlier.

Table 6 Example of use of Victorian Credit Matrix

Qualification	Level	Points (volume)
VCE		
Business	3	96
Business (with VET options)	3	93
Mixed-eclectic	3	96
Service vocational (with VET topics)	3	94
VET		
Cert. II in Business	2	43
Cert. III in Business	3	52
Cert. II in Retail	2	39
Cert. III in Retail	3	37 or 63*

Note: * This has prerequisite component, and the 63 points includes the points earned in undertaking these prerequisites.

The overall qualification level is determined by identifying the most dominant level number in the modules undertaken in the qualification, and the volume is simply the sum of the individual module points. In making this comparison (and there are many comparisons that can be made due to the wide-ranging VET qualifications available) in the Victorian context, the Victorian Certificate of Education (with and without VET options) is not equivalent to the vocational qualifications of certificate II/III in business or retail. The VCE leads to a qualification with a greater volume of learning. However, the Victorian Credit Matrix clearly makes the judgment that certificate IIs are at a lower level than certificate IIIs and VCE courses.

The judgment that certificate IIs are not equivalent to secondary school completion is shared by UNESCO in its application of ISCED, as can be seen from table 7. ISCED aligns the senior secondary certificate with university enabling courses and AQF certificate III.

⁸ <<http://www.vrqa.vic.gov.au/cmatrix/design.htm>>.

Table 7 ISCED classifications

ISCED level	Qualification level
0	Pre-primary, kindergarten, pre-school
1	Primary
2A/B	Certificate I and II (general enabling, bridging courses)
2C	Certificate I and II (basic vocational)
3A/B	Higher school certificate, university enabling courses, AQF certificate III
3C	AQF statement of attainment
4 A/B	Certificate IV
5A	Bachelor, bachelor with honours, master's (research and coursework)
5B	Diploma, advanced diploma, grad certs. grad diploma
6	PhD, professional doctorate

Source <http://www.uis.unesco.org/ev_en.php?ID=7434_201&ID2=DO_TOPIC>; UNESCO Institute for Statistics (1997 [2006]).

By contrast, the corresponding classification system used in Australia, ASCED (ABS 2001) ranks all certificates above senior secondary education (table 8).

Table 8 ASCED qualification levels

Broad level	Narrow level	Qualification
1		<i>Postgraduate degree level</i>
	11	Doctoral degree
	12	Master degree
2		<i>Graduate diploma and graduate certificate</i>
	21	Graduate diploma
	22	Graduate certificate
3		<i>Bachelor degree level</i>
	31	Bachelor degree
4		<i>Advanced diploma and diploma level</i>
	41	Advanced diploma and associate degree
	42	Diploma
5		<i>Certificate level</i>
	51	Certificate III and IV
	52	Certificate I and II
6		<i>Secondary education</i>
	61	Senior secondary education
	62	Junior secondary education
7		<i>Primary education</i>
	71	Primary education
8		<i>Pre-primary education</i>
	81	Pre-primary education
9		<i>Other education</i>
	91	Non-award courses
	99	Miscellaneous education

However, the earlier discussion suggests that the ASCED hierarchy does not capture the relative complexity of certificates I, II, III and IV. One aspect that makes the notion of equivalence problematic is that senior secondary certificates cover a very broad range of complexity. The Australasian Curriculum, Assessment and Certification Authorities (ACACA) responded to the recent AQF review as follows:

we also write to convey our significant concern regarding the Council's proposal ... to locate the Senior Secondary Certificate of Education at one specific level with the Australian Qualifications Framework. This proposal ... is significantly at odds with the purpose and nature of senior secondary certificates and is inconsistent with the policy context in which senior secondary certificates operate.

Senior secondary certificates across the Australian states and territories are intentionally designed to address the learning needs and pathways of individual students who possess varying abilities and who will exit with varying levels of achievement. The proposed placement of the Senior Secondary Certificate at *any* single level – whether it be level 2, level 3 or any other level – is not compatible with the purpose of the certificate and the nature of the student cohort who undertake it.

Our broad conclusion is that examining the educational attributes of certificates I and II and comparing them with senior school certificates has not been very helpful in establishing a vocational equivalence to the senior secondary certificate.

In terms of educational outcomes, it is clear from course descriptors that vocational qualifications have a much narrower set of skills and application of knowledge, and that these are typically geared towards specific vocational tasks. The completion of senior secondary schooling leads to a much broader education, with specialised knowledge in some areas and is less focused on vocational outcomes.

The equivalence of outcomes

The third approach in establishing equivalence is to focus on outcomes subsequent to the qualification. That is, we judge qualifications to be equivalent if they have similar outcomes. Of course, this necessitates choosing appropriate outcome variables and also choosing an age at which to measure the outcomes. In our choice of outcomes variables, we follow the lead of the AQF, which places the senior secondary certificate at level 3: 'knowledge and skills for skilled employment and further study'. We therefore focus on employment and further study outcomes, specifically:⁹

- full-time employment
- full-time engagement (full-time study, full-time work or part-time work and study)
- occupational prestige (measured using the ANU scales of occupational prestige)
- gross weekly wages for those in full-time employment
- further study at diploma or higher level; this level of study has been selected because it is the level into which Year 12 typically provides entry
- whether or not in part-time employment, for females only
- occupational status and gross weekly wage for females in part-time employment.

It is worth noting that gender differences play a significant role in outcomes. For example, more females choose to work part-time due to having a family or because they have caring responsibilities. Using full-time employment only as one successful outcome for females may therefore not be appropriate. Hence, we considered three extra measures specific to females in our analysis: part-time employment, occupational status, and gross weekly wage for those in part-time employment (and not in full-time study).

The choice of age is dictated by our source of data, the Longitudinal Surveys of Australian Youth. This provides data up to age 25 years. While we would have preferred to look at outcomes over an individual's life, the age of 25 years is quite defensible on the basis that it represents an age at which the transition to adulthood is, for most people, largely complete.

This analysis is restricted to two LSAY cohorts – those who on average completed their senior secondary schooling in 1998 or 2001. These cohorts of young people were entering the labour market when it was buoyant. Therefore, it is possible that the success of the completion of different qualifications would differ in a less friendly labour market, and this caveat should be kept in mind when interpreting the results.

Data and descriptive statistics

LSAY is a longitudinal, stratified cluster sample survey, in which schools form a single cluster. The stratification variables are: state, sector, and size of location of school attended.

In this study the interest lies in determining the equivalence of labour market and further study outcomes against a range of qualification levels. Given the fact that the youth transition period is a time when young people are exploring different school and post-school options, it would be naive to

⁹ See appendix B for the specification of the variables.

assume that each individual will only undertake a single qualification. However, in order to satisfactorily assess relevant qualifications, the qualification levels that we have assumed are the individual's first qualification (including school level) *completed* by the time they have reached the age of 21. The qualification levels used in this study are outlined in table 9. Individuals who had changed courses, withdrew or did not complete, and had not completed Year 12 were assigned to the completed Year 11 or below category. Note that completing Year 12 means being awarded the senior secondary certificate. For example, an individual who may have not completed school but who completed a certificate III would be assigned to category 4, regardless of whether they have gone on to complete a higher-level qualification.

Table 9 List of qualification levels compared

Qualification category	First qualification complete
1	Completed senior secondary certificate and TER in the top 50%
2	Completed senior secondary certificate and did not obtain TER or TER in bottom 50%
3	Completed Year 11 or below only (no further post-school education completed by age 21)
4	Year 11 or below and completed a certificate II
5	Year 11 or below and completed certificate III
6	Year 11 or below and completed apprenticeship
7	Year 11 or below and completed traineeship
8	Year 11 or below and completed other qualifications (certificate I and non-award)
9	Year 11 or below and completed certificate IV or higher
10	Unknown qualification levels

In table 9, there are two categories that include completing the senior secondary certificate. In assessing equivalence we discard the first category. Our reasoning is that vocational alternatives have little relevance to highly academic students and therefore it would be unreasonable to compare their outcomes with those students undertaking vocational certificates.

The Y95 and Y98 cohorts were combined into a single dataset. This was undertaken to ensure reasonable sample sizes in the treatment groups, particularly for Year 12 non-completers. When the datasets are combined, variables from each dataset are chosen so that they represent individuals of the same age. For example, in deriving labour force status at age 25 years, this variable will contain information from the 2005 calendar year for those respondents in the Y95 cohort and 2008 for those from Y98. The following table lists the relevant age, calendar year, average school year level for each of the Y95 and Y98 cohorts.

Table 10 Age and year concordance between 1995 and 1998 cohorts

Age	Y95	Y98	Potential educational experience
15	1995	1998	Year 9
16	1996	1999	Year 10
17	1997	2000	Year 11
18	1998	2001	Year 12
19	1999	2002	Post-school + 1 (TER score and Year 12 completion recorded in survey)
20	2000	2003	Post-school + 2
21	2001	2004	Post-school + 3 (first qualification completed recorded)
22	2002	2005	Post-school + 4
23	2003	2006	Post-school + 5
24	2004	2007	Post-school + 6
25	2005	2008	Post-school + 7 (labour market and further study outcomes derived)

Table 11 shows the percentage of the sample in each of the qualification levels at age 25. Around 85% of all LSAY respondents complete their senior secondary schooling. Of the 15% who do not, the majority do not complete any further qualifications (Year 11 or below only); of those who do, the most popular qualifications are apprenticeships, traineeships and others.

Table 11 Qualification level completed by age 21 (measured at age 25)

Qualification level	Unweighted frequency	Unweighted %	Weighted frequency	Weighted %
Completed Year 12 and TER in top 50%	3484	43.1	2765	34.2
Completed Year 12 and TER in bottom 50% or no TER obtained	3389	41.9	3888	48.1
Year 11 or below only	629	7.8	742	9.2
Year 11 or below and completed certificate II	60	0.7	74	0.9
Year 11 or below and completed certificate III	63	0.8	80	1.0
Year 11 or below and completed apprenticeship	167	2.1	216	2.7
Year 11 or below and completed traineeship	135	1.7	150	1.9
Year 11 or below and other qualifications (certificate I and non-award)	108	1.3	121	1.5
Year 11 or below and completed certificate IV or higher	57	0.7	56	0.7

Statistical methodology

In the analysis of an individual's outcomes, their background characteristics play a substantial role in explaining this success.

If we were undertaking an experiment, it would be possible to randomly allocate individuals to an 'educational pathway'. In doing so, background characteristics would be evenly spread across these pathways. (For example, random allocation would ensure that the mean academic achievement level is the same for each educational outcome.) However, random allocation is not possible, nor is it desirable in the social science context. An alternative approach is the use of propensity scoring as a substitute for the random allocation of pathways to individuals. In propensity scoring, a statistical model is fitted to the data and the probability of completing Year 12 is determined according to a range of given background characteristics (known to influence Year 12 completion). The characteristics incorporated in our analysis are:

- Indigenous status (1 = Indigenous, 0 = non-Indigenous)
- parental occupation (measured using ANU_3, based on father's occupation or, if that is missing, mother's occupation)
- state of school attended in first wave of survey
- gender
- maths achievement score in Year 9 (out of 20)
- reading achievement score in Year 9 (out of 20)
- type of school attended in first wave of the survey (government, Catholic or independent)
- size of locality of school, for school attended in first wave of survey (metropolitan, regional, rural/remote).

Details of the propensity scores regression model appear in appendix C, along with the relevant output. These propensity scores are then used as weights in the regression models of outcomes against treatments.

In addition, we employ two other sets of weights. The first is that of simple survey weights derived in the first wave of the survey. These weights are determined based on the sample design employed in collecting the data. The use of sample weights ensures that the distribution of the sample matches the underlying distribution of the original population.

The second sets of weights are the attrition weights. Attrition weights are calculated according to a number of key variables considered to influence non-response. In LSAY, these variables typically include academic achievement, locality, school type, gender and Indigenous status. The use of attrition weights ensures that the distribution of these variables matches the underlying distribution of these variables in the original population.

Unfortunately, weighting cannot correct for all types of attrition, although Ryan (2011) argues that attrition does not seriously affect this type of statistical analysis.

In this analysis, the propensity weights are combined with the sampling and attrition weights to form a single weight. The major statistical technique used in this paper is that of weighted mixed model regression. The type of regression used is dependent upon the characteristics of our variable of interest. There are two categories of response variable. The first is a binary (yes/no) outcome and the second is a continuous (for example, number of hours worked). Further, all models include terms that account for the sampling scheme employed and a component that allows for systematic differences between the different cohorts. Further details and outputs from these models are available in appendix D.

Results

Details of the various regressions are at appendix D.

Tables 12 and 13 present a summary of the findings by gender across all of the labour market and further study outcomes. The highlighted cells indicate the qualification levels which *have significantly worse outcomes* than completed Year 12.

Table 12 Summary of Year 12 equivalence for all outcomes for males (at age 25)

Qualification level	Predicted probability of full-time employment	Predicted probability of full-time engagement	Occupational status	Gross weekly wage (\$)	Undertaking further study
Completed Year 12 and TER in bottom 50% or no TER obtained	0.785	0.853	43	945	0.353
Year 11 or below and apprenticeship completed	<i>0.901</i>	0.930	33	<i>1317</i>	0.036
Year 11 or below and certificate II completed	0.793	0.793	35	906	0.193
Year 11 or below and certificate III completed	0.803	0.862	35	1063	0.094
Year 11 or below and certificate IV or higher completed	0.912	0.912	44	868	NA
Year 11 or below and other certificates completed	0.865	0.865	34	1045	0.068
Year 11 or below and no further qualification completed	0.774	0.801	36	981	0.075
Year 11 or below and traineeship completed	0.811	0.849	37	916	0.141

Notes: * includes certificate IV or above

Bold text indicates a probability that is significantly worse than completing Year 12.

Italic text indicates a probability that is significantly higher than completing Year 12.

Table 13 Summary of Year 12 equivalence for all outcomes for females (at age 25)

Qualification level	Predicted probability of full-time employment	Predicted probability of part-time employment	Predicted probability of full-time engagement	ANU_3 score	ANU_3 score for part-time workers	Gross weekly wage (\$)	Gross weekly wage for part-time workers (\$)	Undertaking further study
Completed Year 12 and TER in bottom 50% or no TER obtained	0.609	0.252	0.654	49	42	783	463	0.476
Year 11 or below and apprenticeship completed	0.553	0.202	0.553	31	38	744	412	0.069
Year 11 or below and certificate II completed	0.276	0.163	0.349	46	38	760	230	0.065
Year 11 or below and certificate III completed	0.543	0.318	0.588	43	35	703	453	0.152
Year 11 or below and certificate IV or higher completed	0.560	0.236	0.662	47	39	756	373	NA ^a
Year 11 or below and other certificates completed	0.502	0.245	0.533	41	31	814	382	0.110
Year 11 or below and no further qualification completed	0.432	0.273	0.502	44	34	717	383	0.162
Year 11 or below and traineeship completed	0.588	NA ^b	0.637	41	NA ^b	733	NA ^b	0.130

Notes: a Includes certificate IV or above.

b Combined with apprentices.

Bold text indicates a probability that is significantly worse than the completing Year 12 category.

Consider males first. Table 12 essentially shows that the idea of Year 12 equivalence from the point of view of equivalent outcomes is of very little use. In relation to three of the outcome measures (full-time employment, full-time engagement and gross weekly wages for full-time workers), all categories are equivalent to Year 12, including leaving school before Year 12 and undertaking no vocational education and training. In relation to undertaking further study, no alternative pathway is equivalent to Year 12. This leaves only two outcomes for which there is any discrimination: occupational status of full-time workers and wages of full-time workers. In relation to the first of these, we find that Year 11 plus an apprenticeship (which in almost all cases would include a certificate III) is significantly poorer than a Year 12. In relation to the second of these we find the opposite: that Year 11 plus an apprenticeship leads to higher wages (at age 25) than Year 12 (remembering that our comparator Year 12 group consists of those who had a TER in the bottom 50% or no TER). Thus our conclusion is that Year 11 plus an apprenticeship is not equivalent to Year 12, but is not necessarily inferior to it. Overall, vocational certificates are different from completing Year 12 and therefore the notion of equivalence makes little sense.¹⁰

For females (table 13) the situation is little better. The concept of a vocational equivalent to Year 12 is not useful in relation to occupational status, gross weekly wage, and undertaking further study. However, the concept is meaningful for the probability of being full-time employed or fully engaged. For both of these outcomes, certificate II or no further qualifications gives outcomes worse than those obtained for completing Year 12.

In making these observations we need to be wary about averages and be aware that there will be a wide distribution of results. This paper has focused on outcomes at the age of 25, which we are taking as the end point of the transition for youth. Outcomes at later ages will differ, particularly in terms of occupational status and wages. These later points in life may certainly emphasise the importance of completing senior secondary school. Further, the results must be considered in conjunction with the very strong labour market conditions that existed at the points in time when the outcomes for this cohort of young people were measured.

¹⁰ Some of these results in relation to occupational status may be due to relatively high standard errors. However, if we take a naive approach and look at the estimates of occupational status we see that only certificate IV has an occupational status close to Year 12 (44 and 43, respectively). This is not very helpful because very few undertake certificate IV and this is not a qualification suggested as a possibility for equivalence; this category also includes those who may have completed a qualification higher than certificate IV, such as diplomas or degrees.

Concluding comments

We have argued that the concept of equivalence is a difficult one and we have not emerged with results that would give much comfort to those hoping to establish equivalence between a VET certificate II or III and the completion of Year 12. A fundamental problem is that vocational certificates and completion of Year 12 have different aims, making it easy to establish differences between qualifications, but much harder to make any sense of the notion of equivalence. If we measure equivalence in input terms, then some certificate IIIs involve a similar effort to an additional year of school. However, even here the level of complexity is likely to be different. If we look at outcomes, then we get no neat equivalences. In relation to some outcome measures, all qualification categories, including leaving school early without undertaking any further study, are as good as completing Year 12. At the other extreme, if we believe that undertaking higher-level study is a worthwhile outcome, then none of the VET certificates is anywhere near equivalent to completing Year 12. In terms of wages for male full-time workers, undertaking Year 11 plus an apprenticeship is superior to completion of Year 12.

Does this mean that we should abandon the notion of a vocational equivalent to Year 12? To do so would create a problem. There is a cohort of young people who do not wish to complete Year 12 and who are not academically inclined, and it is quite reasonable to provide worthwhile pathways for such people. In this regard the idea of a vocational equivalent is a useful rhetorical device. That said, promoting the idea of a vocational equivalent such that the community understands a vocational certificate to be equivalent to Year 12 may be creating false expectations. In terms of differentiating between a certificate II and a certificate III, the latter typically takes more time and is of greater complexity. And, at least for females, the certificate II leads to significantly poorer labour market outcomes, as measured by the probability of being in full-time employment. This would suggest that a vocational equivalent, even if used only for rhetorical purposes, should be at least at the certificate III level.

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Appendix A: International frameworks

International frameworks

Given that the Australian framework provides little advice on the equivalence of vocational qualifications to the senior secondary certificate (in terms of learning outcomes, or volume of learning), it is useful to investigate the frameworks of other developed nations. The most recent development is that of the European Qualifications Framework (EQF).

The EQF aims to relate different countries' national qualifications systems to a common European reference framework. Individuals and employers will be able to use the EQF to better understand and compare the qualifications levels of different countries and different education and training systems.

Agreed upon by the European institutions in 2008, the EQF is being put in practice across Europe. It encourages countries to relate their national qualifications systems to the EQF so that all new qualifications issued from 2012 carry a reference to an appropriate EQF level. An EQF national coordination point has been designated for this purpose in each country.

(European Qualifications Framework)

The framework is based on learning outcomes rather than inputs. The reasons for focusing on outcomes include:

- There should be a better match between the needs of the labour market and education and training.
- This approach can facilitate the validation of informal and non-formal learning.
- This approach can facilitate the transfer of qualifications across different countries.

The framework consists of eight levels, ranging from basic to advanced, which describe a learner's outcomes. For each level there is a set of common learning descriptors that relate to three types of learning:

- knowledge: theoretical or factual
- skills: cognitive and practical
- competence: responsibility and autonomy.

Note that the type of qualification is not necessarily aligned to any particular level within the framework. In particular, senior secondary certificates would not be given a particular level by the framework itself. Where they sit for a country will depend on the analysis of the learning outcomes across the three sets of learning descriptors. This is also the case for vocational and higher education qualifications.

Scotland and Ireland are two participating countries who are referring their own national qualifications to the EQF.

Scotland's framework, known as the Scottish Credit and Qualifications Framework (SCQF) is similar to that of the Victorian Credit Matrix in that it uses two measures – the levels of qualifications and credit points to describe qualifications. The following describes the SCQF:

The SCQF has twelve levels ranging from access at SCQF level 1, up to doctorate at Level 12. The different levels indicate the level of difficulty of a particular qualification and increases in levels relate to factors such as:

- the complexity and depth of knowledge and understanding;
- links to associated academic, vocational or professional practice;
- the degree of integration, independence and creativity required;
- the range and sophistication of application/practice; and
- the role(s) taken in relation to other learners/workers in carrying out tasks.

(Scottish Credit and Qualifications Framework)

Learning outcomes for each level are described under five broad headings: knowledge and understanding; practice; generic cognitive skills; communication, literacy and IT skills; and autonomy, accountability and working with others.

However, while qualifications at a given level have broadly comparable levels of outcomes, the qualifications may have different purposes, content or outcomes, so they should not be seen as interchangeable. In particular, Gallacher et al. (2005), in an evaluation of the impact of the framework, note that 'the framework does not demonstrate the equivalence of qualifications' (p.12). Rather, the framework adopts a 'best fit' method by using broad descriptors to accommodate different types of knowledge (Qualifications and Curriculum Authority 2007).

The second aspect to the Scottish framework is the allocation of credit points for qualifications. These points show how long, on average, a course takes to complete. As with Victoria's credit matrix, one credit point equates to ten notional hours of learning time. The final factor regarding this framework is that it is not a regulatory framework and so institutions that deliver qualifications are not obliged to use only the Scottish Credit and Qualifications Framework.

Ireland is a second country that is implementing qualifications frameworks in the European context. Their framework is Ireland's National Framework of Qualifications (NFQ). This framework aims to be the framework through which learning achievements can be measured and related to each other. In this way the framework aims to provide a way of comparing qualifications.

The NFQ has ten hierarchical levels. The levels are based on learning outcomes and range from basic (level 1) through to doctoral level (level 10). Each level of the framework specifies learning outcomes according to three major categories:

- knowledge: breadth and kind
- know-how and skill: range and selectivity
- competence: role, learning to learn and having insight.

Within this framework, school leaving certificates occupy levels 4 and 5 (National Qualifications Authority of Ireland 2003).

A third country that has implemented qualifications framework is South Africa — the National Qualifications Framework (NQF). The South African NQF has ten hierarchical levels. Level 1 is the general education level, levels 2–4 represent further education and training certificates and levels 5–10 represent higher education and training, which includes higher certificates, advanced VET to doctoral degrees. Each level specifies the learning achievement or outcomes appropriate to a qualification at that level. However, it is worth noting that the South African NQF levels span qualification levels, for example, bachelor degrees may be in NQF level 7 or NQF level 8, and in

particular, Year 12 (as opposed to a senior secondary certificate) spans NQF levels 3 and 4, which includes vocational certificates at level 3, advanced vocational qualifications and higher certificates.

The New Zealand Qualification Framework (NZQF) has ten levels, with levels 1–4 representing certificates; levels 5 and 6 diplomas; level 7 bachelors, graduate diplomas and certificates; levels 8–10 postgraduate qualifications. Certificates may be used in all levels up to and including level 7. Certificates are typically used to prepare individuals for both employment and further education and training. National certificates recognise skills and knowledge that meet nationally endorsed standards and can be gained in a wide range of areas. Certificates include the National Certificates of Educational Achievement (NCEA), which are the main qualifications obtained in senior secondary schooling and are typically at levels 1–3. Certificates represent achievement in a wide variety of industries and subjects (New Zealand Qualifications Framework website).

One final international qualification framework is that of the International Standard Classification of Education (ISCED). ISCED was developed by UNESCO to facilitate the comparison of education statistics and indicators within and between countries. Table 7 in the report presents the ISCED classifications. ISCED aligns senior secondary with university enabling courses and AQF certificate III.

Figure A1 ISCED level structure

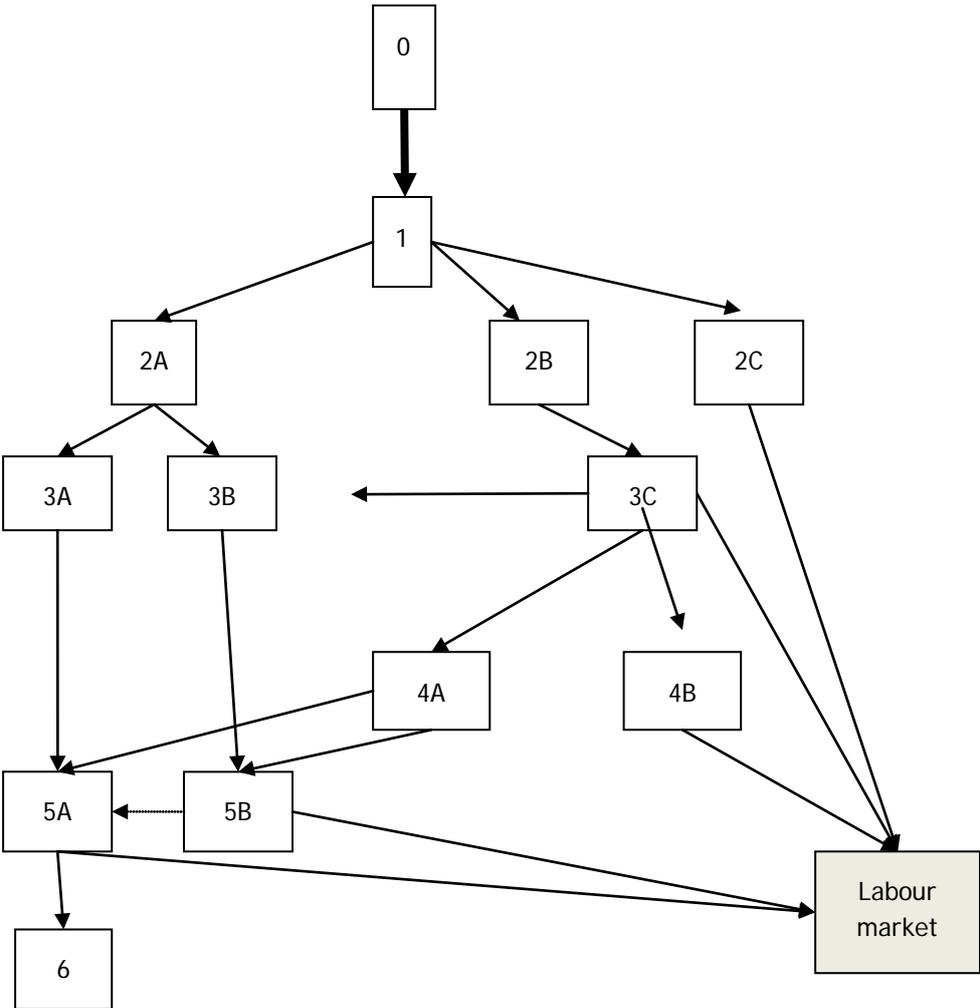


Figure A1 presents the likely transition patterns from each ISCED level to others. While there is some hierarchy from level 0 to level 6, when applied to AQF-level qualifications, it becomes difficult to assign an ordinal level. For example, ISCED level 3 includes AQF certificate III, senior school certificates and university enabling courses.

There is an equivalent framework in Australia. The corresponding classification system used in Australia is that of the Australian Standard Classification of Education (ASCED) (ABS 2001). Table 8 in the main report presents the level of ASCED qualifications. ASCED is partially an ordinal scale, particularly in relation to 'university' qualifications. However, it classifies VET qualifications in broad levels 4 and 5, and senior secondary education in the lower broad level 6. Broad level 5 includes certificates I and II and there would be no argument that most senior secondary school completion provides a greater educational outcome than that offered through the completion of certificates I and II.

This section has outlined some of the international qualification frameworks. There are similarities across these frameworks. What is clear is that none of these frameworks attempts to equate qualifications, and in particular, none attempts to define equivalent vocational qualifications to senior secondary schooling. A further interesting aspect is that most other countries have senior secondary certificates that span multiple levels in a qualifications framework.

Appendix B: Details of outcome variables

The outcomes measured in the analysis are:

- full-time employment: measured as working more than 35 hours per week in their main job
- full-time engagement: whether a respondent is in full-time study, full-time work or a combination of part-time work and part-time study
- occupational prestige: a continuous measure utilising the ANU scales, for those in full-time employment
- gross weekly wages for those in full-time employment
- whether the respondent has undertaken any further study at a diploma or higher level. This level of study has been selected because it is the level to which Year 12 typically provides entry
- whether or not in part-time employment for females only
- occupational status and gross weekly wage for females in part-time employment, where they are in part-time employment, and not undertaking any further study.

The occupational prestige of respondents is determined using the ANU_3 (and ANU_32) scales of occupational prestige developed by Jones (1989). The occupations of young people are coded to the Australian Standard Classification of Occupations (ASCO) versions one and two in the LSAY datasets. The ANU_3 measure corresponds to the first edition of ASCO and ANU_32 scale is a revised version of the ANU_3 score that adapts the ANU_3 scale for the second edition of ASCO (McMillan & Jones 2000).¹¹ Examples of the ASCO to ANU coding appear in table B1.

The occupational prestige measures provide a mechanism to assign sociologically meaningful occupational status scores to data coded in accordance with the official occupational classifications of the ABS. There are two scales used in this paper: the first, for the Y95 cohort is the ANU_42 scale, which converts ASCO version 2 into prestige measures; the second measure is the Australian Socioeconomic Index 2006 (AUSEI06), which converts the Australian and New Zealand Standard Classifications of Occupations (ANZSCO) to the prestige measure. These two scales use a similar methodology in their derivation. Scores are assigned to occupations in such a way as to maximise the role of occupation as an intervening variable between education and income. Occupations are viewed as the means of converting a person's human capital (education) into material rewards (occupation). The measures are derived using relevant data from the ABS Census of Population and Housing.

There is a strong relationship (correlation = 0.98) between AUSEI06 and the ANU4 scales. Further information on the details and history of the occupational prestige measures can be found in McMillan, Beavis and Jones (2009). Examples of the occupational groupings and ANU4, AUSEI06 scales appear below.

¹¹ The coding frames that have been used to convert the ASCO scores to ANU scores were downloaded from http://ipumsi.anu.edu.au/SiteTools/Status_Scales/scalesgen.php.

Table B1 Occupational categories and occupational prestige measures

ANZSCO sub-major group ^(a)	AUSEI06	Indicative occupational title (ASCO 2nd edition) ^(b)	ANU4 score
1 <i>Managers</i>	58.1	General managers	73.4
Chief executives, general managers and legislators	78.2	Other generalists managers	49.9
Farmers and farm managers	34.0	Resource managers	73.1
Specialist managers	71.4	Engineering and process managers	63.2
Hospitality, retail and service managers	45.4	Sales & marketing managers	63.2
2 <i>Professionals</i>	81.6	Other specialist managers	80
Arts and media professionals	68.1	Managers n.e.c	55.2
Business, human resource and marketing professionals	77.3	Farmers & farm managers	46.3
Design, engineering, science and transport professionals	81.2	Natural science professionals	86.2
Education professionals	84.9	Architects and related professionals	83.6
Health professionals	85.1	Engineers	83.8
ICT professionals	81.3	Other science & engineering professionals	83.4
Legal, social and welfare professionals	84.4	Accountants & related professionals	81.4
3 <i>Technicians and trades workers</i>	35.9	Sales & related professionals	62
Engineering, ICT and science technicians	57.7	Computing professionals	78.5
Automotive and engineering trades workers	30.4	Human resource professionals	62.4
Construction trades workers	36.4	Business & organisation analysts	76.4
Electrotechnology and telecommunications trades workers	41.0	Other business professionals	79.4
Food trades workers	21.2	Medical practitioners	100
Skilled animal and horticultural workers	32.7	Nursing professionals	75.3
Other technicians and trades workers	33.5	Other health professionals (higher)	94.5
4 <i>Community and personal service workers</i>	41.7	Other health professionals (lower)	80.1
Health and welfare support workers	60.0	Primary school teachers	84.5
Carers and aides	34.9	Secondary school teachers	89.7
Hospitality workers	34.7	University teachers	95.7
Protective service workers	47.8	Other education professionals (higher)	84.3
Sports and personal service workers	49.8	Other education professionals (lower)	74.5
5 <i>Clerical and administrative workers</i>	45.6	Social welfare professionals	73.2
Office managers and program administrators	57.4	Legal professionals	96
Personal assistants and secretaries	44.8	Other professionals (higher)	74.8
General clerical workers	41.9	Other professionals (lower)	63
Inquiry clerks and receptionists	37.3	Medical & science technical officers	56.1
Numerical clerks	48.8	Building associate professionals	56.2
Clerical and office support workers	37.7	Finance associate professionals	63.2
Other clerical and administrative workers	47.1	Office managers	46.5
6 <i>Sales workers</i>	34.8	Other business associate professionals	58.9
Sales representatives and agents	50.7	Real estate associate professionals	49.2
Sales assistants and salespersons	30.8	Computing support technicians	54.6
Sales support workers	32.0	Shop managers	41

ANZSCO sub-major group^(a)	AUSEI06	Indicative occupational title (ASCO 2nd edition)^(b)	ANU4 score
<i>7 Machinery operators and drives</i>	21.0	Restaurant & catering managers	39.6
Machine and stationary plant operators	25.1	Chefs	32.1
Mobile plant operators	14.7	Other hospitality managers	40.5
Road and rail drivers	21.1	Other sales & service managing supervisors	48.4
Storepersons	20.8	Health & welfare associate professionals	51.2
<i>8 Labourers</i>	18.5	Police officers	48.5
Cleaners and laundry workers	20.4	Other associate professionals	49.5
Construction and mining labourers	23.3	Metal fitters & machinists	39.9
Factory process workers	12.1	Other mechanical engineering tradespersons	43.1
Farm, forestry and garden workers	11.0	Fabrication engineering tradespersons	31.3
Food preparation assistants	22.0	Motor mechanics	33
Other labourers	24.8	Other automotive tradespersons	31.7
		Electricians	42.8
		Other electrical tradespersons	40.6
		Carpenters & joiners	39.5
		Painters & decorators	37.3
		Plumbers	40.4
		Other construction tradespersons	35.9
		Cooks	17.7
		Other food tradespersons	24.1
		Skilled agricultural workers (higher)	28.5
		Other horticultural workers (lower)	28.3
		Printing tradespersons	35
		Wood tradespersons	31.5
		Hairdressers	32.8
		Other tradespersons (higher)	41.2
		Other tradesperson (lower)	30
		Secretaries & personal assistants	34.9
		Bookkeepers	39.5
		Other advanced clerical workers	47.8
		General clerks	36.1
		Keyboard operators	32.2
		Receptionists	30.1
		Accounting clerks	41.5
		Bank workers	35.5
		Other numerical clerks	39.1
		Stock & purchasing clerks	31.8
		Other recording & dispatching clerks	35.5
		Inquiry & admission clerks	41.1
		Other intermediate clerical workers	46.7
		Sales representatives	41.2
		Other intermediate sales workers	24.9
		Education aides	31.6
		Children's care workers	35.4
		Special care workers	35.5
		Personal care & nursing assistants	25.9

ANZSCO sub-major group ^(a)	AUSEI06	Indicative occupational title (ASCO 2nd edition) ^(b)	ANU4 score
		Bar attendants	26.7
		Waiters	36.4
		Other intermediate service workers (higher)	44.1
		Other intermediate service workers (lower)	31.9
		Mobile construction plant operators	16.3
		Forklift drivers	7.2
		Intermediate stationary plant operators	26.2
		Other intermediate plant operators	14.7
		Intermediate machine operators n.e.c	21
		Intermediate textile machine operators	8.5
		Miscellaneous intermediate machine operators	21.5
		Truck drivers	14
		Transport assistants	27.2
		Car & delivery drivers	32.2
		Other transport drivers	17.8
		Storepersons	19
		Other intermediate production & transport workers	27.3
		Elementary clerks	34.7
		Sales assistants	27.4
		Checkout operators & cashiers	24.5
		Other elementary sales workers	33.7
		Guards & security officers	27.6
		Other elementary service workers	24.8
		Labourers n.e.c	5.1
		Cleaners	18.3
		Factory labourers	12.4
		Product packages	9.6
		Mining, construction & related labourers (higher)	17.1
		Mining, construction & related labourers (lower)	7.6
		Agricultural & related labourers	0
		Kitchenhands	19.5
		Miscellaneous labourers	22.7

Notes: (a) ANZSCO sub-major groups (2-digit) are presented. The LSAY data are recoded to unit group (4-digit). The ANZSCO to AUSEI06 correspondence for this level is available from: <<http://www.acer.edu.au/statics/ausei06>>.

(b) This is the 4-digit coding of ASCO 2nd edition to ANU 4. Note however, that the occupational titles are indicative only, and there are several 4-digit occupations coded in each group.

Table B2 Summary statistics of qualification levels by various outcomes: part 1

Qualification level	Percentage in full-time employment		Percentage full-time engaged		Occupational prestige	
	Male	Female	Male	Female	Male	Female
Completed Year 12 and TER in top 50%	75.7	69.3	84.2	76.1	60.9	64.5
Completed Year 12 and TER in bottom 50% or no TER obtained	78.8	62.4	83.5	65.6	43.8	47.4
Year 11 or below and no further qualification completed	78.6	38.2	80.9	43.5	33.8	38.1
Year 11 or below and certificate II completed	78.8	36.2	78.8	42.3	36.7	46.7
Year 11 or below and certificate III complete	87.4	51.2	87.4	55.6	40.5	40.5
Year 11 or below and apprenticeship completed	88.4	54.0	89.2	54.0	32.0	36.4
Year 11 or below and traineeship complete	73.6	59.7	76.1	62.8	32.7	41.3
Year 11 or below and other certificates completed	76.6	43.4	76.6	49.5	33.0	39.7
Year 11 or below and certificate IV or higher completed	81.0	56.1	81.0	56.1	40.8	46.3

Table B3 Summary statistics of qualification levels by various outcomes: part 2

Qualification level	Gross weekly wage		Percentage undertaking further study	
	Males	Females	Males	Females
Completed Year 12 and TER in top 50%	\$907.93	\$803.91	85.2	87.2
Completed Year 12 and TER in bottom 50% or no TER obtained	\$858.57	\$689.64	37.9	49.5
Year 11 or below and no further qualification completed	\$892.43	\$587.51	7.0	12.9
Year 11 or below and certificate II completed	\$971.79	\$652.01	20.7	14.0
Year 11 or below and certificate III completed	\$1157.60	\$628.92	9.4	11.8
Year 11 or below and apprenticeship completed	\$1305.21	\$670.11	2.4	9.7
Year 11 or below and traineeship completed	\$857.38	\$661.32	9.3	16.8
Year 11 or below and other certificates completed	\$877.43	\$595.93	8.8	16.4
Year 11 or below and certificate IV or higher completed	\$857.31	\$663.56	NA	NA

Tables B2 and B3 present descriptive statistics for each of the outcome variables against each of the qualification levels under consideration, separated by gender. It is clear from these tables that those individuals who complete Year 12 with a reasonable TER score do better in terms of occupational prestige and further study options. In terms of full-time employment, individuals who completed Year 12 do slightly worse than the other categories, but that is not surprising, given that some of these individuals may well be in study. This is also reflected in full-time engagement, in which Year 12 completers perform better than the other categories, apart from certificate IIIs and apprenticeships, which are very much connected to the world of work. This is also reflected in the gross weekly wages reported, with males who undertake certificate III or apprenticeships having higher gross weekly wages. However, this phenomenon may be due to the nature of the LSAY data, in which reporting stops at age 25. There is evidence to show that those who undertake bachelor degrees have greater earning capacity, but this is observed after the age of 25. For females, completing Year 12 with a reasonable TER appears to be the best option for all labour market and further study outcomes.

Appendix C: Propensity score regression

The logistic model used to determine the propensity scores is:

$$\text{logit}(y) = \mathbf{X}\boldsymbol{\tau} + \mathbf{Z}\mathbf{u} + \boldsymbol{\epsilon}$$

where $\mathbf{X} = [\mathbf{X}_1^{n \times 1}, \mathbf{X}_2^{n \times 1}, \mathbf{X}_3^{n \times 8}, \mathbf{X}_4^{n \times 2}, \mathbf{X}_5^{n \times 1}, \mathbf{X}_6^{n \times 1}, \mathbf{X}_7^{n \times 3}, \mathbf{X}_8^{n \times 3}, \mathbf{X}_9^{n \times 4}]$, the design matrices for the intercept, parental occupation, state, gender, maths achievement, reading achievement, type of school, size of location of school and overall achievement quartiles respectively,

$\boldsymbol{\tau} = [\boldsymbol{\tau}_1^{1 \times 1}, \boldsymbol{\tau}_2^{1 \times 1}, \boldsymbol{\tau}_3^{8 \times 1}, \boldsymbol{\tau}_4^{2 \times 1}, \boldsymbol{\tau}_5^{1 \times 1}, \boldsymbol{\tau}_6^{1 \times 1}, \boldsymbol{\tau}_7^{3 \times 1}, \boldsymbol{\tau}_8^{3 \times 1}, \boldsymbol{\tau}_9^{4 \times 1}]$, $\mathbf{Z} = [\mathbf{Z}_1^{n \times 2}, \mathbf{Z}_2^{n \times 592}]$, the design matrices for random cohort and school factors, $\mathbf{u} = [\mathbf{u}_1^{2 \times 1}, \mathbf{u}_2^{592 \times 1}]$, represent the random regression co-efficients for cohort and school respectively, further we assume $\mathbf{u}_1^{2 \times 1} \sim N(\mathbf{0}, \sigma_c^2 \mathbf{I}_2)$, and $\mathbf{u}_2^{574 \times 1} \sim N(\mathbf{0}, \sigma_{sc}^2 \mathbf{I}_{592})$, and $\boldsymbol{\epsilon} \sim N(\mathbf{0}, \sigma_e^2 \mathbf{I}_n)$. Further, we note that $\text{cov}(\mathbf{u}, \boldsymbol{\epsilon}) = \mathbf{0}$, that is, \mathbf{u} and $\boldsymbol{\epsilon}$ are uncorrelated.

The probability of completing Year 12 is determined using:

$$\hat{\pi}_i = \frac{\exp(\mathbf{X}\hat{\boldsymbol{\tau}} + \mathbf{Z}\hat{\mathbf{u}})}{1 + \exp(\mathbf{X}\hat{\boldsymbol{\tau}} + \mathbf{Z}\hat{\mathbf{u}})}$$

and the propensity score weights for each individual are calculated using:

$$w_i = \begin{cases} \frac{1}{\hat{\pi}_i}, & \text{if individual } i \text{ completed Year 12} \\ \frac{1}{(1 - \hat{\pi}_i)}, & \text{if individual } i \text{ did not complete Year 12} \end{cases}$$

Table C1 Model fit statistics for propensity score regression

Criterion	Criteria for assessing goodness of fit		
	DF	Value	Value/DF
Deviance	22 000	27 468.03	1.25
Scaled deviance	22 000	27 468.03	1.25
Pearson Chi-square	22 000	22 029.49	0.10
Scaled Pearson X2	22 000	22 029.49	0.10
Log likelihood		-13 734.02	

Table C2 Model estimates from propensity scores regression

Parameter	Estimate	Standard error	Pr > Z	Predicted probability of completion
Intercept	-4.306	0.759	<.0001	
Non-Indigenous	0.795	0.122	<.0001	0.40
Indigenous		REFERENCE CATEGORY		0.16
Parental occupation (ANU_3)	0.005	0.001	<.0001	
ACT	0.096	0.137	0.4824	0.42
NSW	0.051	0.101	0.6125	0.39
Vic.	0.298	0.100	0.0030	0.42
Qld	0.212	0.102	0.0365	0.40
SA	0.208	0.113	0.0656	0.42
WA	0.064	0.105	0.5434	0.38
Tas.		REFERENCE CATEGORY		0.36
NT	0.001	0.159	0.9947	0.35
Male	0.017	0.674	0.9800	0.37
Female	0.323	0.673	0.6308	0.43
Unknown gender		REFERENCE CATEGORY		
Maths score	0.077	0.009	<.0001	
Reading score	0.072	0.008	<.0001	
Government	-0.080	0.068	0.2443	0.36
Catholic	0.150	0.076	0.0474	0.45
Independent		REFERENCE CATEGORY		0.47
Metropolitan area	0.708	0.165	<.0001	0.41
Regional area	0.707	0.164	<.0001	0.38
Rural/remote	0.737	0.169	<.0001	0.39
Unknown		REFERENCE CATEGORY		

Table C3 Score statistics from propensity scores regression

Source	DF	Chi-square	Pr > ChiSq
Indigenous status	1	45.90	<.0001
Parental occupation (ANU_3)	1	47.97	<.0001
State of school attended	7	22.45	0.0021
Sex	2	74.82	<.0001
Maths score	1	69.16	<.0001
Reading score	1	70.57	<.0001
School sector	2	18.63	<.0001
Size of area of school location	3	22.32	<.0001

We observe that all are important in explaining Year 12, the factors that contribute positively to completing Year 12 are:

- non-Indigenous
- higher parental occupation
- female
- higher maths and reading test scores.

From table C4, it is clear that the propensity score regression has done a reasonable job in balancing the background demographics for Year 12 completion. The first column of this table shows the original

percentage of those who did not complete Year 12 for each of the background demographics. The second column shows the same information but this time utilising the propensity weights.

Table C4 Distribution of not completing Year 12, with and without propensity score weights

Demographic variable	Distribution of not completing Year 12 without propensity score weights (%)	Distribution of not completing Year 12 using propensity score weights (%)
<i>Indigenous status:</i>		
Non-indigenous	14.7	49.8
Indigenous	36.7	52.0
<i>State of school attended in 1995:</i>		
ACT	9.7	47.5
NSW	14.5	50.2
Vic.	11.9	50.3
Qld	10.6	50.5
SA	19.2	49.1
WA	20.0	49.5
Tas.	25.4	46.0
NT	27.2	52.7
<i>Sex:</i>		
Male	18.0	48.5
Female	12.4	51.0
<i>School type:</i>		
Government	19.0	49.6
Catholic	9.0	49.2
Independent	8.8	51.5
<i>Size of place of residence in 1995:</i>		
Metropolitan area	11.6	50.1
Regional area	19.8	49.4
Rural and remote area	18.4	49.5
<i>Achievement quartiles:</i>		
First	32.2	50.0
Second	19.5	48.6
Third	12.3	52.5
Fourth	7.5	48.4

Note: The distribution for completing Year 12 is obtained as 100 minus the values given in the above table.

Appendix D: Regression results

The two forms of the mixed models used in this paper are:

$$\mathbf{y} = \mathbf{X}\boldsymbol{\tau} + \mathbf{Z}\mathbf{u} + \boldsymbol{\epsilon} \quad (1)$$

$$\text{logit}(\mathbf{y}) = \mathbf{X}\boldsymbol{\tau} + \mathbf{Z}\mathbf{u} + \boldsymbol{\epsilon} \quad (2)$$

where \mathbf{X} is the design matrix for the fixed effects, $\boldsymbol{\tau}$ is the vector of fixed regression parameters, \mathbf{Z} is the design matrix for the random effects, \mathbf{u} is the vector of random regression parameters, and $\boldsymbol{\epsilon}$ is the matrix of residuals. Further, we assume that $\mathbf{u} \sim N(\mathbf{0}, \mathbf{G})$ and $\boldsymbol{\epsilon} \sim N(\mathbf{0}, \mathbf{R})$ and $\text{cov}(\mathbf{u}, \boldsymbol{\epsilon}) = \mathbf{0}$, that is, \mathbf{u} and $\boldsymbol{\epsilon}$ are uncorrelated.

The included random effects remain the same for all models, such that, $\mathbf{Z} = [\mathbf{Z}_1, \mathbf{Z}_2, \mathbf{Z}_3, \mathbf{Z}_4]$, where $\mathbf{Z}_1^{2 \times n}$ represents the design matrix for the random cohorts, $\mathbf{Z}_2^{16 \times n}$ represents the design matrix for states within cohort, $\mathbf{Z}_3^{6 \times n}$ represents the design matrix for school type within cohort, and $\mathbf{Z}_4^{574 \times n}$ represents the design matrix for schools. $\mathbf{u} = [\mathbf{u}_1, \mathbf{u}_2, \mathbf{u}_3, \mathbf{u}_4]$, where $\mathbf{u}_1^{2 \times 1}$ is the vector of random regression coefficients for cohort, $\mathbf{u}_2^{16 \times 1}$ represents the vector of random regression coefficients for each state within cohort, $\mathbf{u}_3^{6 \times 1}$ is the vector of random regression coefficients for school type within cohort and $\mathbf{u}_4^{574 \times 1}$ is the vector of random coefficients for each school. Further, $\mathbf{u}_1^{2 \times 1} \sim N(\mathbf{0}, \sigma_c^2 \mathbf{I}_2)$, $\mathbf{u}_2^{16 \times 1} \sim N(\mathbf{0}, \sigma_{st}^2 \mathbf{I}_{16})$, $\mathbf{u}_3^{6 \times 1} \sim N(\mathbf{0}, \sigma_{ty}^2 \mathbf{I}_6)$, $\mathbf{u}_4^{574 \times 1} \sim N(\mathbf{0}, \sigma_{sc}^2 \mathbf{I}_{592})$, and $\boldsymbol{\epsilon} \sim N(\mathbf{0}, \sigma_e^2 \mathbf{I}_n)$.

It is worth noting that models that have a continuous response (weekly wage, ANU_3) use the SAS procedure MIXED incorporating Kenward-Roger adjustments for degrees of freedom.

The following tables present the parameter estimates for each of the labour market and further study variables. Full model-fit statistics, variance component estimates and estimates of random effects are available by contacting the author. For each outcome, figures of predicted probabilities and their confidence intervals are presented. Confidence intervals that do not overlap highlight significant differences.

Full-time employment

Table D1 Tests of fixed effects for full-time employment (at age 25)

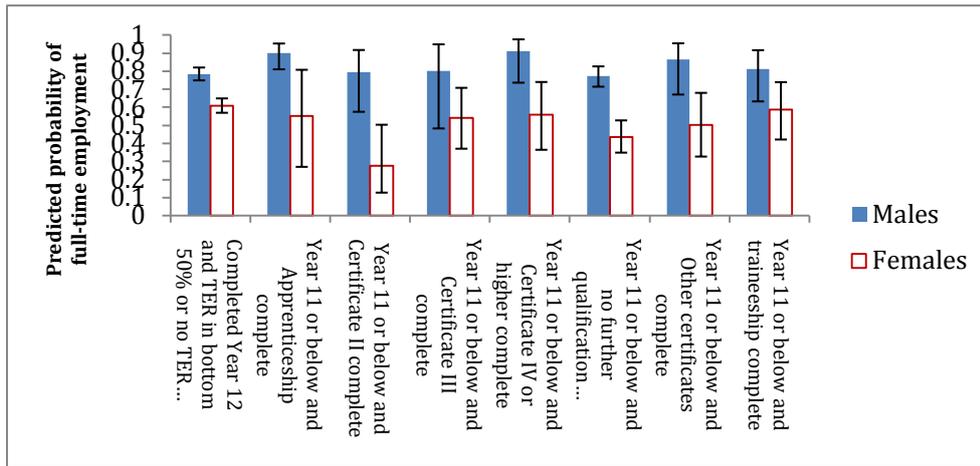
Source	DF	Chi-square	Pr > ChiSq
SEX	1	10.51	0.0012
quallevel_A	7	10.3	0.1723
quallevel_A*SEX	7	12.6	0.0826

Table D2 Parameter estimates for logistic regression on full-time employment (at age 25)

Parameters	Estimate	Standard error	95% confidence limits of regression coefficient		Z	Pr > Z	Predicted probability of full-time employment	
Intercept	2.33	0.67	1.02	3.65	3.48	0.0005		
Male	REFERENCE CATEGORY						0.795	
Female	-2.10	0.79	-3.64	-0.56	-2.67	0.0076	0.577	
Completed Year 12 and TER in bottom 50% or no TER obtained	-1.04	0.68	-2.37	0.30	-1.52	0.1278	0.696	
Year 11 or below and no further qualification completed	-1.11	0.69	-2.50	0.24	-1.6	0.1086	0.625*	
Year 11 or below and certificate II completed	-0.10	0.85	-2.67	0.68	-1.16	0.2443	0.560	
Year 11 or below and certificate III completed	-0.93	1.01	-2.90	1.04	-0.92	0.3555	0.621	
Year 11 or below and apprenticeship completed	-0.12	0.78	-1.65	1.40	-0.16	0.8733	0.874	
Year 11 or below and traineeship completed	-0.88	0.81	-2.48	0.72	-1.07	0.2825	0.690	
Year 11 or below and other certificates completed	-0.48	0.89	-2.22	1.26	-0.54	0.5894	0.677	
Year 11 or below and certificate IV or higher completed	REFERENCE CATEGORY						0.714	
Completed Year 12 and TER in bottom 50% or no TER obtained	Female	1.24	0.79	-0.31	2.80	1.56	0.1179	0.609
Year 11 or below and no further qualification completed	Female	0.60	0.83	-1.02	2.23	0.73	0.4661	0.435*
Year 11 or below and certificate II completed	Female	-0.21	1.10	-2.36	1.94	-0.19	0.8487	0.276*
Year 11 or below and certificate III completed	Female	0.86	1.15	-1.39	3.11	0.75	0.4530	0.543
Year 11 or below and apprenticeship completed	Female	0.10	1.07	-2.00	2.20	0.09	0.9273	0.553
Year 11 or below and traineeship completed	Female	0.10	0.99	-0.94	2.93	1.01	0.3129	0.588
Year 11 or below and other certificates completed	Female	0.25	1.08	-1.87	2.37	0.23	0.8168	0.502
Year 11 or below and certificate IV or higher completed	Female	REFERENCE CATEGORY						0.560
Completed Year 12 and TER in bottom 50% or no TER obtained	Male	REFERENCE CATEGORY						0.785
Year 11 or below and no further qualification completed	Male	REFERENCE CATEGORY						0.774
Year 11 or below and certificate II completed	Male	REFERENCE CATEGORY						0.793
Year 11 or below and certificate III completed	Male	REFERENCE CATEGORY						0.803
Year 11 or below and apprenticeship completed	Male	REFERENCE CATEGORY						0.901*
Year 11 or below and traineeship completed	Male	REFERENCE CATEGORY						0.811
Year 11 or below and other certificates completed	Male	REFERENCE CATEGORY						0.865
Year 11 or below and certificate IV or higher completed	Male	REFERENCE CATEGORY						0.912

Note: *Indicates significantly different from reference category of completed Year 12 at the 5% level.

Figure D1 Probability of being in full-time employment at age 25 by gender and qualification level



Part-time employment for females only

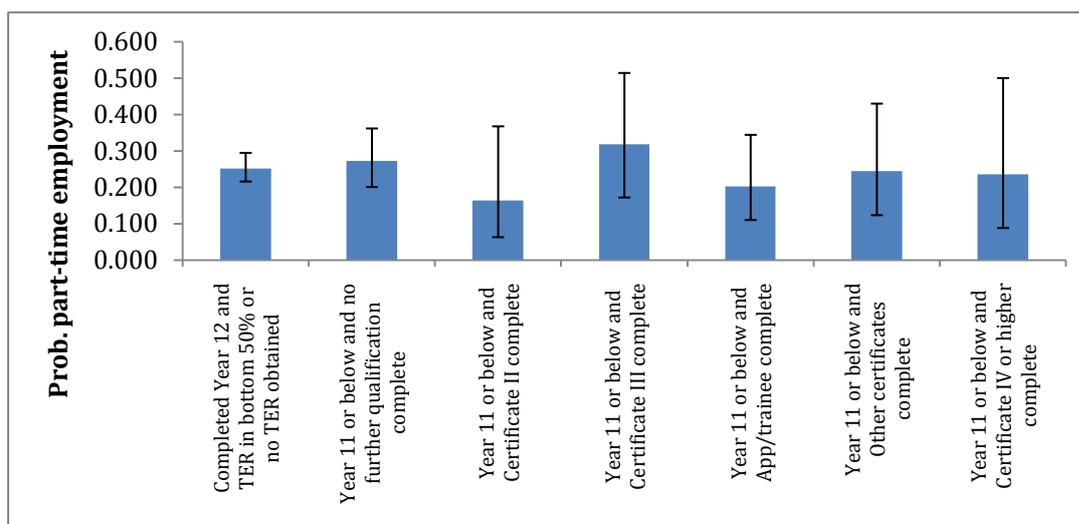
Table D3 Test of fixed effect for females in part-time employment (at age 25)

Source	DF	Chi-square	Pr > ChiSq
Qualification level	6	2.7	0.8455

Table D4 Parameter estimates for logistic regression for females in part-time employment (at age 25)

Parameters	Estimate	Standard error	95% confidence limits		Z-value	P-value	Predicted probability of part-time employment	
			Lower	Upper				
Intercept	-1.18	0.60	-2.35	-0.01	-1.96	0.0498		
Completed Year 12 and TER in bottom 50% or no TER obtained	0.09	0.61	-1.10	1.28	0.15	0.8822	0.252	
Year 11 or below and no further qualification completed	0.20	0.64	-1.05	1.45	0.31	0.7576	0.273	
Year 11 or below and certificate II completed	-0.46	0.85	-2.13	1.22	-0.54	0.5919	0.163	
Year 11 or below and certificate III completed	0.41	0.69	-0.94	1.77	0.6	0.5484	0.318	
Year 11 or below and app/trainee completed	-0.20	0.70	-1.57	1.18	-0.28	0.7768	0.202	
Year 11 or below and other certificates completed	0.05	0.71	-1.35	1.45	0.07	0.946	0.245	
Year 11 or below and certificate IV or higher completed			REFERENCE CATEGORY					0.236

Figure D2 Predicted probabilities of part-time employment for females who are not studying by qualification at age 25



Full-time engagement

Table D5 Tests of fixed effects for full-time engagement (at age 25)

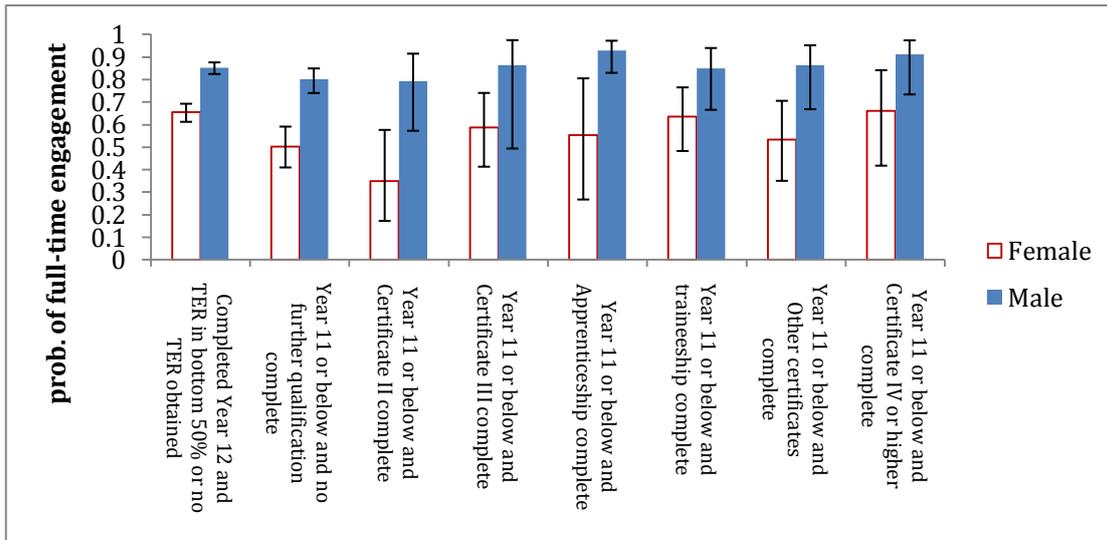
Source	DF	Chi-square	Pr > ChiSq
SEX	1	16.23	<.0001
quallevel_A	7	12.6	0.0826
quallevel_A*SEX	7	4.45	0.7269

Table D6 Parameter estimates for logistic regression on full-time engagement (at age 25)

Parameters	Estimate	Standard error	95% confidence limits		Z	Pr > Z	Predicted probability of full-time engagement	
Intercept	2.34	0.67	1.01	3.65	3.48	0.0005		
Male	REFERENCE CATEGORY						0.850	
Female	-1.66	0.84	-3.31	-0.01	-1.97	0.0491	0.626	
Completed Year 12 and TER in bottom 50% or no TER obtained	-0.58	0.68	-1.91	0.76	-0.85	0.3971	0.753	
Year 11 or below and no further qualification completed	-0.94	0.69	-2.30	0.41	-1.36	0.1731	0.670*	
Year 11 or below and certificate II completed	-0.99	0.85	-2.67	0.68	-1.16	0.2443	0.593	
Year 11 or below and certificate III completed	-0.50	1.16	-2.77	1.77	-0.43	0.6666	0.667	
Year 11 or below and apprenticeship completed	0.25	0.84	-1.40	1.91	0.30	0.7634	0.900	
Year 11 or below and traineeship completed	-0.61	0.85	-2.28	1.07	-0.71	0.4779	0.735	
Year 11 or below and other certificates completed	-0.48	0.89	-2.22	1.26	-0.54	0.5894	0.696	
Year 11 or below and certificate IV or higher completed	REFERENCE CATEGORY						0.782	
Completed Year 12 and TER in bottom 50% or no TER obtained	Female	0.54	0.84	-1.11	2.20	0.64	0.5213	0.654
Year 11 or below and no further qualification completed	Female	0.27	0.88	-1.46	2.00	0.31	0.7568	0.502*
Year 11 or below and certificate II completed	Female	-0.30	1.12	-2.50	1.89	-0.27	0.7865	0.349*
Year 11 or below and certificate III completed	Female	0.18	1.32	-2.40	2.76	0.14	0.8923	0.588
Year 11 or below and apprenticeship completed	Female	-0.72	1.16	-2.98	1.55	-0.62	0.5351	0.553
Year 11 or below and traineeship completed	Female	0.49	1.05	-1.57	2.56	0.47	0.6402	0.637
Year 11 or below and other certificates completed	Female	-0.06	1.13	-2.27	2.15	-0.05	0.9568	0.533
Year 11 or below and certificate IV or higher completed	Female	REFERENCE CATEGORY						0.662
Completed Year 12 and TER in bottom 50% or no TER obtained	Male	REFERENCE CATEGORY						0.853
Year 11 or below and no further qualification completed	Male	REFERENCE CATEGORY						0.801
Year 11 or below and certificate II completed	Male	REFERENCE CATEGORY						0.793
Year 11 or below and certificate III completed	Male	REFERENCE CATEGORY						0.862
Year 11 or below and apprenticeship completed	Male	REFERENCE CATEGORY						0.930
Year 11 or below and traineeship completed	Male	REFERENCE CATEGORY						0.849
Year 11 or below and other certificates completed	Male	REFERENCE CATEGORY						0.865
Year 11 or below and certificate IV or higher completed	Male	REFERENCE CATEGORY						0.912

Note: * Significantly different from completed Year 12 at the 5% level.

Figure D3 Probability of being full-time engaged at age 25 by gender and qualification level



Occupational prestige (ANU_3)

Table D7 Tests of fixed effects for occupational prestige for those working full-time (at age 25)

Effect	Num DF	Den DF	F Value	Pr > F
SEX	1	2330	4.08	0.0435
quallevel_A	7	2360	4.71	<.0001
quallevel_A*SEX	7	2362	0.19	0.9867

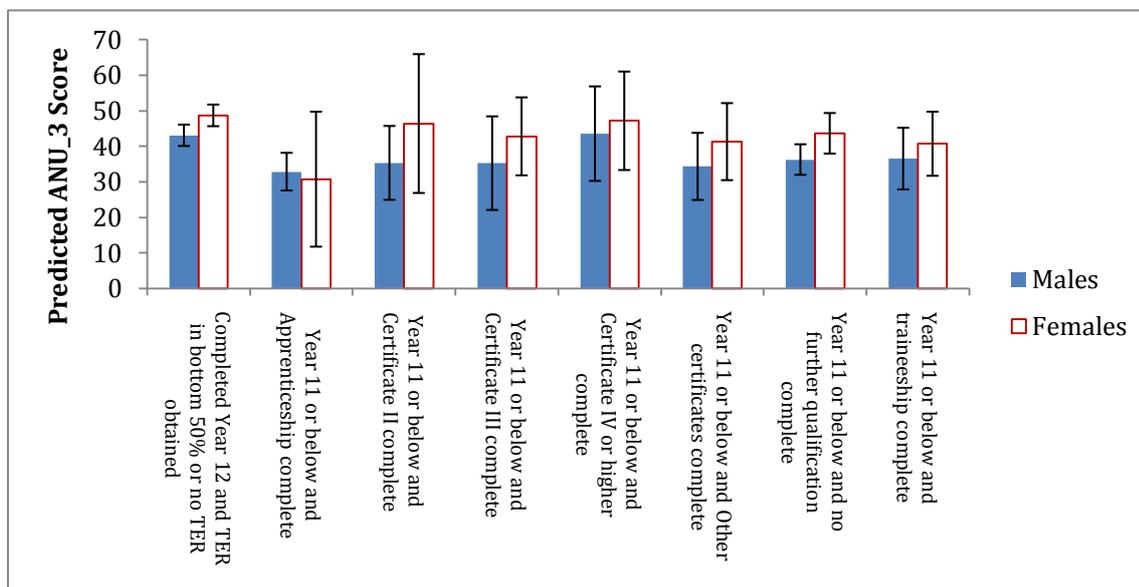
Table D8 Parameter estimates for logistic regression on occupational prestige for those working full-time (at age 25)

Parameters	Sex	Estimate	Standard error	DF	Pr > t	Predicted mean ANU_3 score
Intercept		40.72	4.60	92	<.0001	
Males	Males	-4.17	6.05	2341	0.4907	37*
Females	Females	REFERENCE CATEGORY				43
Completed Year 12 and TER in bottom 50% or no TER obtained		7.98	4.43	2306	0.0718	46
Year 11 or below and apprenticeship completed		-9.97	10.52	2266	0.3436	32*
Year 11 or below and certificate II completed		5.69	10.77	2281	0.5976	41
Year 11 or below and certificate III completed		2.09	6.97	2340	0.7643	39
Year 11 or below and certificate IV or higher completed		6.46	8.16	2336	0.4282	45
Year 11 or below and other certificates completed		0.60	6.93	2403	0.9309	38*
Year 11 or below and no further qualification completed		2.93	5.09	2360	0.5644	40*
Year 11 or below and traineeship completed		REFERENCE CATEGORY				39*
Completed Year 12 and TER in bottom 50% or no TER obtained	Males	-1.44	6.10	2343	0.8132	43
Year 11 or below and apprenticeship completed	Males	6.29	11.57	2296	0.5867	33*
Year 11 or below and certificate II completed	Males	-6.90	12.63	2309	0.5852	35

Parameters	Sex	Estimate	Standard error	DF	Pr > t	Predicted mean ANU_3 score
Year 11 or below and certificate III completed	Males	-3.37	10.44	2359	0.7467	35
Year 11 or below and certificate IV or higher completed	Males	0.55	11.30	2342	0.9609	44
Year 11 or below and other certificates completed	Males	-2.80	9.26	2365	0.7622	34
Year 11 or below and no further qualification completed	Males	-3.20	6.79	2373	0.6375	36*
Year 11 or below and traineeship completed	Males	REFERENCE CATEGORY				37
Completed Year 12 and TER in bottom 50% or no TER obtained	Females	REFERENCE CATEGORY				49
Year 11 or below and apprenticeship complete	Females	REFERENCE CATEGORY				31
Year 11 or below and certificate II completed	Females	REFERENCE CATEGORY				46
Year 11 or below and certificate III completed	Females	REFERENCE CATEGORY				43
Year 11 or below and certificate IV or higher completed	Females	REFERENCE CATEGORY				47
Year 11 or below and other certificates completed	Females	REFERENCE CATEGORY				41
Year 11 or below and no further qualification completed	Females	REFERENCE CATEGORY				44
Year 11 or below and traineeship completed	Females	REFERENCE CATEGORY				41

Note: * Significantly different from completed Year 12 at the 5% level.

Figure D4 Predicted means of occupational prestige by qualification level and gender at age 25



Occupational prestige (ANU_3) for part-time females

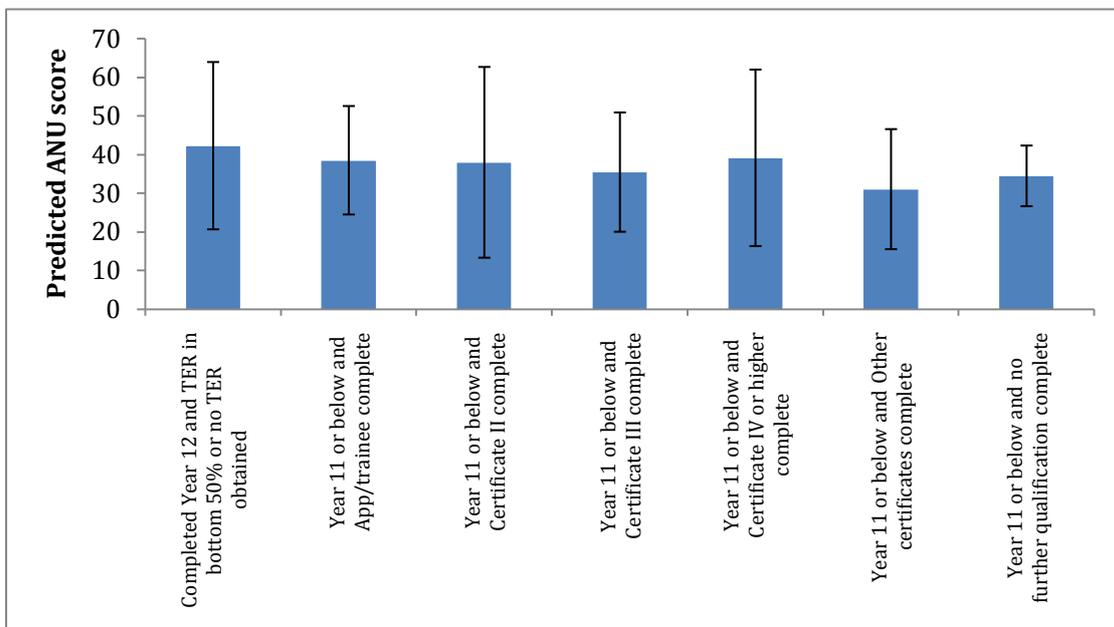
Table D9 Test of fixed effect for occupational prestige for females working part-time (at age 25)

Effect	Num DF	Den DF	F Value	Pr > F
Qualification level	6	280	1.21	0.3036

Table D10 Parameter estimates for logistic regression on occupational prestige for females working part-time (at age 25)

Parameters	Estimate	Standard error	DF	t-value	Pr > t	Predicted mean
Intercept	34.43	3.68	14.80	9.35	<.0001	34.43
Completed Year 12 and TER in bottom 50% or no TER obtained	7.81	3.61	302.00	2.17	0.03	42.25
Year 11 or below and app/trainee completed	4.04	7.70	270.00	0.52	0.60	38.47
Year 11 or below and certificate II completed	3.50	12.95	286.00	0.27	0.79	37.93
Year 11 or below and certificate III completed	0.97	8.35	282.00	0.12	0.91	35.40
Year 11 or below and certificate IV or higher completed	4.67	11.97	289.00	0.39	0.70	39.10
Year 11 or below and other certificates completed	-3.44	8.46	262.00	-0.41	0.68	30.99
Year 11 or below and no further qualification completed						REFERENCE CATEGORY 34.43

Figure D5 Predicted occupational prestige score by qualification level: females working part-time at age 25



Gross weekly wage

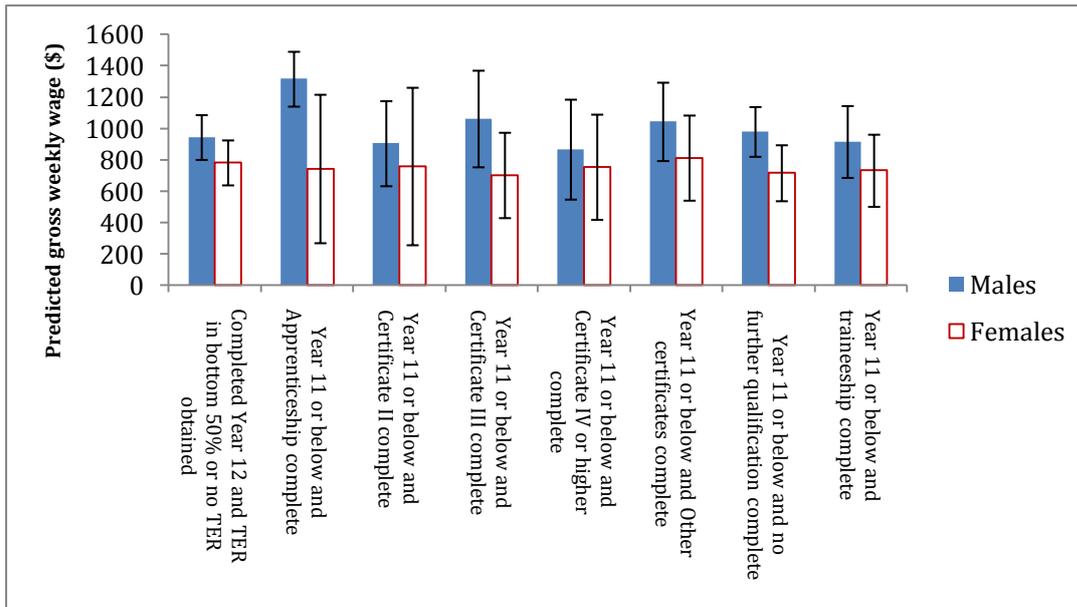
Table D11 Tests of fixed effects for gross weekly wage for those employed full-time (at age 25)

Effect	Num DF	Den DF	F Value	Pr > F
SEX	1	2075	16.19	<.0001
quallevel_A	7	2122	0.51	0.8269
quallevel_A*SEX	7	2122	0.9	0.5015

Table D12 Parameter estimates for regression on gross weekly wage for those employed full-time (at age 25)

Parameters	Sex	Estimate	Standard error	DF	t Value	Pr > t	Predicted mean	
Intercept		733.09	117.26	6.93	6.25	0.0004		
Sex	Males	183.34	130.76	2076	1.4	0.1610	1004.93	
Sex	Females	REFERENCE CATEGORY						751.37
Completed Year 12 and TER in bottom 50% or no TER obtained		50.14	93.87	2077	0.53	0.5933	864.02	
Year 11 or below and apprenticeship completed		11.36	248.58	2094	0.05	0.9636	1030.53	
Year 11 or below and certificate II completed		27.17	262.35	2035	0.1	0.9175	832.89	
Year 11 or below and certificate III completed		-29.86	150.87	2101	-0.2	0.8431	883.12	
Year 11 or below and certificate IV or higher completed		22.56	180.88	2091	0.12	0.9008	811.70	
Year 11 or below and other certificates completed		80.66	150.64	2167	0.54	0.5924	929.25	
Year 11 or below and no further qualification completed		-15.81	108.54	2130	-0.15	0.8842	848.92	
Year 11 or below and traineeship completed		REFERENCE CATEGORY						824.76
Completed Year 12 and TER in bottom 50% or no TER obtained	Males	-21.76	132.08	2082	-0.16	0.8692	944.82	
Completed Year 12 and TER in bottom 50% or no TER obtained	Females	REFERENCE CATEGORY						783.23
Year 11 or below and apprenticeship completed	Males	388.82	270.4	2096	1.44	0.1506	1316.61	
Year 11 or below and apprenticeship completed	Females	REFERENCE CATEGORY						744.45
Year 11 or below and certificate II completed	Males	-38.08	301.71	2046	-0.13	0.8996	905.52	
Year 11 or below and certificate II completed	Females	REFERENCE CATEGORY						760.25
Year 11 or below and certificate III completed	Males	176.45	225.52	2125	0.78	0.4341	1063.02	
Year 11 or below and certificate III completed	Females	REFERENCE CATEGORY						703.22
Year 11 or below and certificate IV or higher completed	Males	-71.24	250.04	2095	-0.28	0.7757	867.75	
Year 11 or below and certificate IV or higher completed	Females	REFERENCE CATEGORY						755.65
Year 11 or below and other certificates completed	Males	47.66	205.01	2112	0.23	0.8162	1044.76	
Year 11 or below and other certificates completed	Females	REFERENCE CATEGORY						813.75
Year 11 or below and no further qualification complete	Males	79.92	147.29	2116	0.54	0.5874	980.55	
Year 11 or below and no further qualification completed	Females	REFERENCE CATEGORY						717.28
Year 11 or below and traineeship completed	Males	REFERENCE CATEGORY						916.43
Year 11 or below and traineeship completed	Females	REFERENCE CATEGORY						733.09

Figure D6 Gross weekly wage by qualification level and gender for full-time workers at age 25



Gross weekly wage for females employed part-time

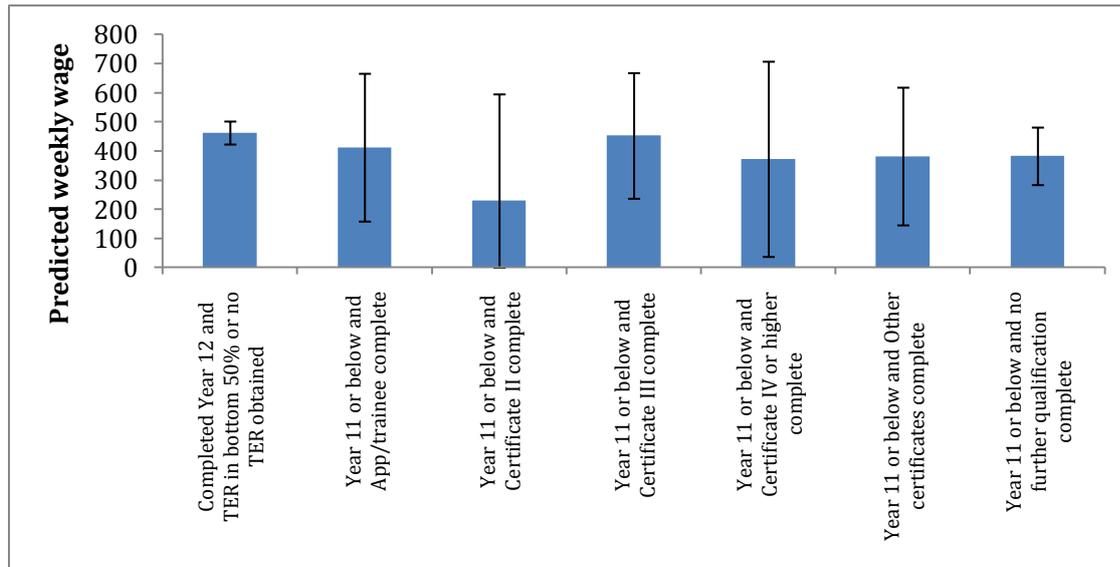
Table D13 Test of fixed effect for gross weekly wage for females working part-time (at age 25)

Effect	Num DF	Den DF	F Value	Pr > F
Qualification Level	6	221	0.73	0.6229

Table D14 Parameter estimates for logistic regression on gross weekly wage for females working part-time (at age 25)

Parameter	Estimate	Standard error	DF	t Value	Pr > t	Predicted weekly wage
Intercept	382.66	50.10	238.00	7.64	<.0001	382.66
Completed Year 12 and TER in bottom 50% or no TER obtained	79.98	52.35	233.00	1.53	0.13	462.64
Year 11 or below and app/trainee completed	29.71	136.78	217.00	0.22	0.83	412.37
Year 11 or below and certificate II completed	-153.04	192.20	226.00	-0.80	0.43	229.62
Year 11 or below and certificate III completed	70.01	119.27	209.00	0.59	0.56	452.66
Year 11 or below and certificate IV or higher completed	-10.14	176.25	241.00	-0.06	0.95	372.52
Year 11 or below and other certificates completed	-0.61	129.64	198.00	0.00	1.00	382.05
Year 11 or below and no further qualification completed						REFERENCE LEVEL 382.66

Figure D7 Gross weekly wage by qualification level: females working part-time at age 25



Undertaking further study at diploma or higher level

Table D15 Tests of fixed effects for whether undertook further study at diploma or higher level (by age 25)

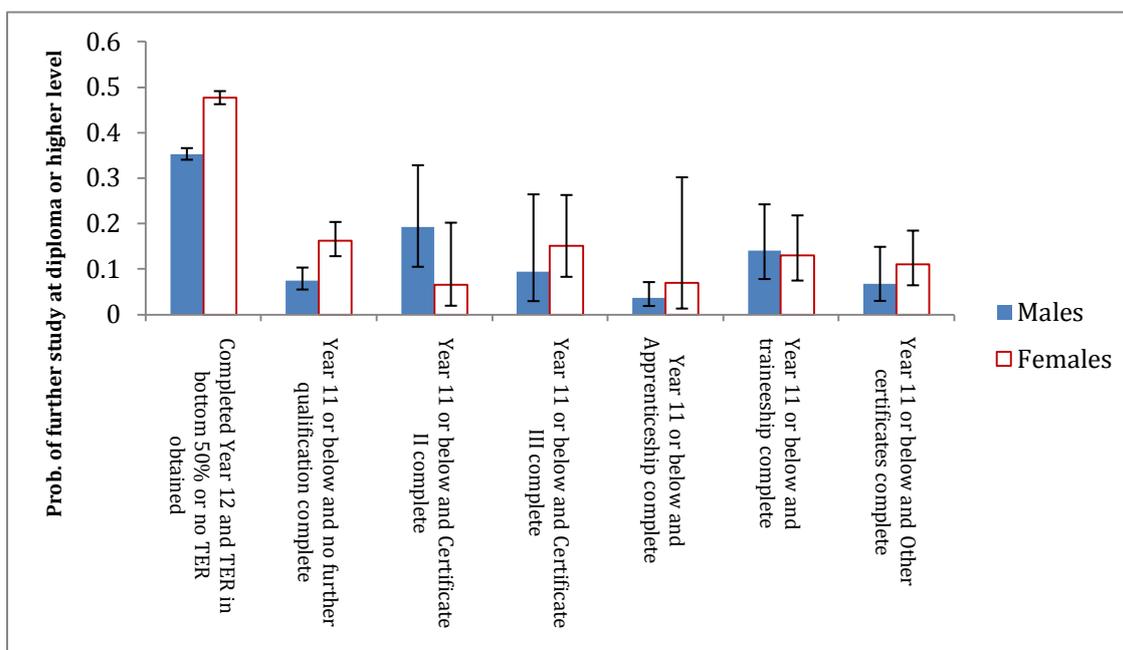
Source	DF	Chi-square	Pr > ChiSq
SEX	1	1.19	0.2745
quallevel_A	6	581.72	<.0001
quallevel_A*SEX	6	10.81	0.0943

Table D16 Parameter estimates for logistic regression on whether undertook further study at diploma or higher level (by age 25)

Parameters	DF	Estimate	Standard error	Chi-square	Pr > ChiSq	Predicted probability of further study
Intercept	1	-2.62	0.45	34.61	<.0001	
Females	1	0.53	0.54	0.97	0.3245	0.398
Males						REFERENCE CATEGORY 0.272
Completed Year 12 and TER in bottom 50% or no TER obtained	1	2.01	0.45	20.33	<.0001	0.414
Year 11 or below and no further qualification completed	1	0.11	0.48	0.05	0.8189	0.113
Year 11 or below and certificate II completed	1	1.19	0.58	4.25	0.0393	0.135
Year 11 or below and certificate III completed	1	0.35	0.77	0.21	0.6505	0.134
Year 11 or below and apprenticeship completed	1	-0.66	0.57	1.32	0.25	0.039
Year 11 or below and traineeship completed	1	0.81	0.56	2.09	0.1482	0.135
Year 11 or below and other certificates completed						REFERENCE CATEGORY 0.091
Completed Year 12 and TER in bottom 50% or no TER obtained Females	1	-0.02	0.54	0	0.9725	0.476

Parameters	DF	Estimate	Standard error	Chi-square	Pr > ChiSq	Predicted probability of further study	
Completed Year 12 and TER in bottom 50% or no TER obtained	Males			REFERENCE CATEGORY		0.352	
Year 11 or below and no further qualification completed	Females	1	0.33	0.59	0.33	0.5676	0.162
Year 11 or below and no further qualification completed	Males			REFERENCE CATEGORY		0.075	
Year 11 or below and certificate II completed	Females	1	-1.76	0.93	3.63	0.0567	0.065
Year 11 or below and certificate II completed	Males			REFERENCE CATEGORY		0.193	
Year 11 or below and certificate III completed	Females	1	0.02	0.90	0	0.9867	0.152
Year 11 or below and certificate III completed	Males			REFERENCE CATEGORY		0.094	
Year 11 or below and apprenticeship completed	Females	1	0.15	1.10	0.02	0.8949	0.069
Year 11 or below and apprenticeship completed	Males			REFERENCE CATEGORY		0.036	
Year 11 or below and traineeship completed	Females	1	-0.62	0.71	0.77	0.381	0.130
Year 11 or below and traineeship completed	Males			REFERENCE CATEGORY		0.141	
Year 11 or below and other certificates completed	Females			REFERENCE CATEGORY		0.110	
Year 11 or below and other certificates completed	Males			REFERENCE CATEGORY		0.068	

Figure D8 Predicted probability of undertaking further study at diploma level or higher by qualification level obtained and gender by age 25





Australian Government
Department of Education, Employment
and Workplace Relations



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