Missing links:
the fragmented relationship
between tertiary education and jobs

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**Department of Industry, Innovation
Science, Research and Tertiary Education**

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RESEARCH REPORT

Publisher's note

Additional information relating to this research is available in *Tertiary student transitions: sectors, fields, impacts of and reasons for study —support document* and *Vocation project interview questions — support document*. These documents can be accessed from NCVER's website: <http://www.ncver.edu.au/publications/2554.html>.

To find other material of interest, search VOCED (the UNESCO/NCVER international database <http://www.voced.edu.au>) using the following keywords: transition from education and training to employment; tertiary education; employment; higher education; labour market; outcomes; pathways; qualifications; vocational education and training.

About the research

Missing links: the fragmented relationship between tertiary education and jobs

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This report is part of a wider three-year program of research, 'Vocations: the link between post-compulsory education and the labour market', which is investigating the educational and occupational paths that people take and how their study relates to their work. It is specifically interested in exploring the transitions that students make in undertaking a second qualification (that is, whether they change field of education and/or move between the VET and higher education sectors). It also looks at the reasons why they decide to undertake another qualification.

The authors use a combination of data from the 2009 Australian Bureau of Statistics Survey of Education and Training and interviews with students and graduates, as well as managers, careers advisors, learning advisors, teachers and academics, to examine these transitions. The finance, primary, health and electrical trades/engineering industries are used as case studies.

Key messages

- Some fields of education have tight links to the workplace (for example, nursing), while others have a much weaker relationship with specific jobs, such as in finance and agriculture.

- The extent to which students stay within their initial field of education depends on how narrowly vocational the field of education is. Those with well-defined occupational pathways tend to stay within their field of education when undertaking their second qualification.

- Students' reasons for undertaking an initial and subsequent qualification are dominated by work-related imperatives.

- Typically, students follow educational pathways for two main reasons: first, because the first credential allows entry into the higher program; and, second, to build confidence in their ability to study.

Tom Karmel
Managing Director, NCVER

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Executive summary

This is a report of the first year of a three-year project entitled 'Vocations: the link between post-compulsory education and the labour market'. The project's aim is to research how pathways can be improved within education, within work, and between education and work. There are three strands in the project: the first strand is researching entry-level vocational education and training (VET), particularly VET in Schools; the second is researching the role of tertiary educational institutions in fostering vocations; and the third is researching how to improve flows within work and how to improve occupational pathways and vocations within the labour market. This report outlines Strand 2's initial findings. The three strands are analysing four industry case studies: finance, primary industry, health and electrical trades/engineering.

Attempts to improve pathways between VET and higher education have focused on relations between the two sectors, between educational institutions, and between the state and Commonwealth governments, which are responsible for VET and higher education, respectively. However, this is only part of the picture. A key determining feature of educational pathways is the structure of the labour market. Where there are strong occupational pathways, strong educational pathways will follow. Apart from the regulated occupations, where criteria for entry and progression are specified by professional or occupational bodies, the Australian labour market is segmented and has weak occupational pathways. The relative absence of these pathways has been exacerbated by an increase in higher- and lower-skilled jobs and a decline in jobs at the intermediate level. This is reflected in the declining importance of the diploma as a labour market entry qualification. Some jobs that previously required diplomas for entry level increasingly now require degrees. The segmentation of the labour market reflects segmentation in educational pathways and the weak relationship between education and jobs. Overall, and again apart from the regulated occupations, relations between education and specific jobs are very weak and most VET graduates do not end up in the jobs associated with their qualification. Most policies that attempt to improve pathways focus only on education and not on the structure of the labour market or the relationship between the two.

This report investigates these issues from the perspective of students, teachers, support staff, and managers in educational institutions, and of graduates from those institutions. It examines student flows within fields of education, within educational sectors and between sectors. While 'getting a job' is students' and graduates' central concern, this is part of their broader priorities, values and desires for the future. The report finds that students use educational pathways for two main reasons: the first is to gain the credentials to enter a higher-level program, and the second is to build their confidence in their ability to study (and often both).

Educational pathways are intrinsic to productivity, lifelong learning, occupational progression and to helping students to realise their goals. However, they can take a very long time for students to complete, and many don't last the distance. Successful student transition is undermined by the different curriculum models in VET and higher education, and there are specific problems with students' level of preparation in mathematics.

While essential, educational pathways cannot overcome social inequality and the absence of occupational pathways. Work placements are intrinsic to learning for work, but they are difficult to find and their quality is variable. This reflects the absence of structured and corporatised relations between employers, employee bodies, educational institutions and government, which specify responsibilities, including resourcing.

There are implications for the nature of qualifications and for the way relationships between education and work are structured. While a focus on educational policies, governance and structures and institutional relationships between VET and higher education is essential to improving educational pathways and improving links between education and work, it is also necessary to focus on the way labour is deployed at work and the way work placements are structured, while recognising that learning needs to support and not supplant the employer's main business.

The report concludes by suggesting that there may be merit in investigating whether flows within education, within work and between the two may be improved by using notions of vocations, vocational streams and capabilities. A vocation emerges from fields of practice where there are commonalities in the nature of practice, and the knowledge, skills and attributes required to work in that field. Vocational streams consist of linked occupations within broad fields of practice and, in turn, each occupation leads to a number of jobs. Individuals need capabilities that allow them to move vertically and horizontally within vocational streams, rather than knowledge and skills for a specific job. Capabilities are underpinned by individual, economic, social, cultural and environmental resources. They result in knowledge, skills, attributes and resources that allow individuals to live their lives, exercise choice, and to exercise autonomy, judgment and creativity at work. Capabilities are specific and not generic. They underpin the knowledge, skills and attributes that individuals need to work within specific vocations. The model of capabilities we are using is based on the work of Nobel Laureate economist Amartya Sen (1999) and the philosopher Martha Nussbaum (2000). This research project is midway through exploring the extent to which the capabilities approach, combined with the notion of vocations and vocational streams, can improve flows within and between education and work. It has the potential to support occupational and educational progression because it focuses on the individual and ensures that they have the broad knowledge, skills and attributes to support them in a range of occupations within a broad vocational stream.

Introduction

Increasing the pathways between vocational and higher education is a central concern of Australian governments. Governments want more pathways to support occupational progression, skills deepening and social inclusion. They consider that the number of pathways and number of students traversing them to be inadequate, and have commissioned many research reports over the last ten years to find out why the pathways are not as strong as desired and how they can be improved. In the main, these reports have focused on the cultural and political problems of the sectoral divide between vocational education and training and higher education, differences in status (real or perceived), policy, funding, governance and administrative requirements, navigating difficult institutional politics (within and between institutions), and indifference. The focus has been on the supply side of education — those who provide it, those who govern and fund it, and those who seek influence over it. The main assumption is that there aren't more pathways and students articulating between the sectors because effective working relations can't be established between the sectors or the Australian and state governments that fund, govern and administer them.

This report takes a different approach: it acknowledges that these issues still matter and discusses what can be done to support students to move between VET and higher education, but it introduces a new way of looking at pathways by exploring the impact that the structure of the labour market (the demand side for education) has on pathways and movement between the sectors. In developing policy and institutional strategies, we need to recognise that educational pathways, transitions and outcomes are shaped by social and institutional factors that mediate the relationship between education and work. In particular, the structure of occupations constrains or facilitates the development of educational pathways.

This is a report of the first year of a three-year project entitled 'Vocations: the link between post-compulsory education and the labour market'. The project's aim is to research how pathways can be improved within education, within work, and between education and work. There are three strands in the project, and this report outlines Strand 2's findings. The three strands are analysing four industry case studies: finance, primary industry, health and electrical trades/engineering. The three strands are:

- *Strand 1: entry to vocations* examines how to improve occupational and further study outcomes for entry-level vocational education and training (VET), including VET in Schools.

- *Strand 2: the role of educational institutions in fostering vocations* considers how to improve occupational outcomes and educational pathways within VET, and between VET and higher education.

- *Strand 3: the nature of vocations today* focuses on how to improve the development and use of skills within core sectors of the labour market, how to improve vocational pathways and the changes that are needed to the institutional arrangements that mediate vocational pathways.

The findings of all three strands so far are that educational pathways are fragmented, labour market pathways are segmented, and that this fragmentation and segmentation also reflects the relationship between educational and labour market pathways. Moreover, policy attempts to improve the link between post-compulsory education and work are very partial, uneven and poorly structured. Most post-compulsory education engages with the labour market as it is: there is little mutual adjustment

between education and work that would be needed for a more orderly flow of people into more desirable educational and labour market trajectories.

In this report we examine these issues from the perspective of students, teachers, pathways officers, learning advisors and managers in educational institutions, as well as graduates from those institutions. Strand 2's key research questions are:

▪ What tertiary education policies, institutional structures and curricular models support students' educational progression from lower- to higher-level qualifications and transitions from education to work, and help overcome discontinuities in sectors, institutions, and qualifications?

▪ Can the notion of vocations help?

The project used mixed methods to answer these questions. This included analysis of international and national literature, analysis of quantitative data, semi-structured interviews with 72 participants, and two seminars, where the three strands reported their findings to participants. Table 1 lists the type of interviewee and number in each category. The Australian Bureau of Statistics (ABS) Surveys of Education and Training (SET) were used to examine:

▪ the change in patterns of post-school education over time

▪ the extent to which higher education and VET students who undertake a second qualification stay within the same field of education as their first qualification, or whether they move to another field of education

▪ students' reports on the impact that their first and second qualifications had on their working lives

▪ students' stated reasons for undertaking their first qualification, and their stated reasons for undertaking their second qualification

▪ the effect of various factors (such as age, original field of education, and the impact of and reasons for undertaking the first and second qualifications) on students' subsequent study decisions.

The Surveys of Education and Training provided insights into patterns of student movement and factors associated with it, while the interview data provided illustrative insights into some of the findings from the quantitative data.

Table 1   Categories of interviewee and number in each category

Interviewee	No. interviewed
VET students	22
Higher education students	9
VET graduates	4
Higher education graduates	3
Managers, pathways officers & learning advisors	13
Teachers/academics	17
UK researchers	4
Total	**72**

A fuller explanation of the project's methods and its limitations is in appendix A. This includes more detail on interviewees, such as type of institution, position, field of education, students' and graduates' level of qualification, and the number of each. The project's interview schedules are

included in the support documents for this project. The support document also contains further information on tertiary student transitions.

It is important to clarify what we mean by pathways, even though there is strong general recognition of the term. This is because it is used to mean a number of different things. Pathways may describe:

- an individual's trajectory through education and employment

- a career path or history of jobs (occupational pathways)

- the string of programs an individual undertakes (educational pathways)

- negotiated arrangements linking qualifications at different levels of the Australian Qualifications Framework (AQF; for example, from the certificate IV or diploma to the bachelor's degree in nursing). These arrangements may enable access, guaranteed access or credit in the destination course.

Educational pathways may be formally negotiated, individually negotiated or ad hoc. Some education pathways include credit. Others provide the foundations for study at the next level but do not provide credit. These are called access pathways. Although not common, pathways (whether used for access or credit) may include a guaranteed place in the destination program. In formally negotiated pathways, the place in the destination program may be conditional on achievement of a particular grade point average. In this report we draw on these different facets of the idea of a 'pathway'.

The next section of the report outlines the conceptual model we used to analyse the quantitative and qualitative data. The following three chapters respectively outline the quantitative findings, students' perspectives, and the perspectives of teachers, pathways officers, learning support advisors and managers in VET and higher education institutions. The final chapter draws again on the conceptual model to respond to Strand 2's second question: whether the notion of vocations can help improve flows within and between education and work. It uses notions of vocations, vocational streams and capabilities to consider this question.

Thinking about pathways differently

In *Revitalising the vocational in flows of learning and labour* (Wheelahan, Moodie & Buchanan 2012), we developed a conceptual framework to explore the relationship between education and the structure of the labour market and social institutions. This was needed because most literature on educational pathways focuses mainly on education and not on the impact the structure of the labour market has on educational pathways. In the analysis that follows, we draw from the national and international literature on transition systems, from interviews with international researchers working on similar projects in England and Scotland, from the findings from international projects also addressing these issues, and from emerging findings of all three strands of the vocations project. Two different types of transition systems literature are used: the first analyses education transition systems and explores the way in which social institutions mediate the transition from education to work (mainly for young people). The second, on transitional labour markets, reconceptualises normal working life to include a series of transitions between employment, education, unemployment and care work (such as raising families). These transitions are critical points where individuals may need support. To understand diversity within nations, we have also drawn from the varieties of capitalism literature to explore the relationship between the way a country structures its economy and education and the skills ecosystems literature.

Pathways reflect the weak relationship between education and jobs

The weak relationship between education and jobs is a problem for policy because governments want better connections between the two so that there is a better 'fit'. The notion of underdeveloped pathways is one aspect of this broader problem. Where there are tight ties between a strongly defined occupational pathway and qualifications controlled by professional and occupational bodies, an educational pathway will follow, even in the absence of strong institutional relationships between the VET and higher education sectors. The clearest example is in nursing. While not universal, it is notoriously difficult to develop pathways between state enrolled nursing qualifications in VET and state registered nursing qualifications in higher education. Their fractious relationship in education reflects their fractious industrial relations within the health system. However, despite this, nursing has one of the highest levels of student articulation compared with other fields (Moodie 2010).

Overall, the links between education and jobs are not strong, with most VET graduates ending up in occupations that are not directly related to their VET qualification (Karmel, Mlotkowski & Awodeyi 2008). There are mismatches between workers' knowledge and skills and the jobs they are required to do, with many finding that their skills are not used sufficiently, or that they need higher-level skills to do their job. Similarly, there are mismatches between level of education and job, with many finding that their qualification is not used sufficiently at work or that they need a higher-level qualification to do their job (Mavromaras, McGuinness & Fok 2010; Mavromaras et al. 2011; Ryan & Sinning 2011).

Most graduates who complete further qualifications do so in their original sector (VET or higher education) rather than move between sectors. There are high levels of student transfer between VET and higher education where there are strong occupational pathways from intermediate to high-skilled jobs (such as in nursing). There are also high levels of transfer between VET and higher education where there are related fields of education in each sector that prepare students for the same industry but without strongly differentiated labour market outcomes or strongly differentiated requirements for knowledge, such as in management and commerce. Pathways are weaker in fields such as the

natural and physical sciences or liberal arts, where the connection between those fields of education and particular occupations is tenuous; or, where each sector prepares students for different occupations within the same broad industry but where the knowledge and skills required for occupations are strongly differentiated, such as in engineering.

Another key problem for pathways is that the diploma is declining as a labour market entry qualification, while it is increasing in importance as a transition from VET to higher education. This reflects changes in the structure of the labour market, whereby many jobs that previously required diplomas now require degrees (Karmel 2010). Moreover, the number and range of high- and low-skilled jobs have increased, while jobs which require intermediate skills have declined (Cully 2003). The decline in intermediate skilled jobs is the 'missing link' in occupational pathways, and this limits the effectiveness of pathways within post-compulsory education and training. Educational pathways are essential, but they are not sufficient to create labour market pathways. Educational pathways created in the absence of occupational pathways are mainly a transition from lower- to higher-level studies.

A conceptual framework

The weak relationship between education and jobs in Australia is a reflection of the structure of the Australian economy and labour market. Broadly speaking, Anglophone countries such as Australia, the United Kingdom and the United States tend to have loose relations between education and work, while countries in Northern Europe have much closer links. This reflects the different way each organises their economies (Hall & Soskice 2001). Anglophone liberal market economies use the labour market to match graduates and jobs, and graduates need similar, broad knowledge and skills to compete with each other. Where this is the case, education mainly screens in those regarded as high achievers, reflected by academic achievement, and screens out those regarded as low achievers.

In contrast, coordinated market economies such as those in Northern Europe use social partnerships between employers, unions, government and education to match graduates and jobs. There are much tighter links between education and work because of this relationship. While getting agreement between the social partners can be slow and cumbersome, nonetheless each has a good understanding of the other and their requirements.

Educational provision differs in liberal and coordinated market economies. Ianelli and Raffe (2007) describe education systems in countries with weak institutional links between education and work (like those in Anglophone liberal market economies) as having an 'educational logic', while education systems in countries with strong institutional links (like those in coordinated market economies) are described as having an 'employment logic'. Systems with an educational logic don't have strong relations between VET and the labour market, and vocational education is less differentiated from academic education (as in the senior school certificates) and has stronger links to tertiary education. Education is used as a screen, and 'potential is indicated by the level of study and attainment in education, and vocational qualifications may signal a low educational level' (Iannelli & Raffe 2007, p.51). This helps to account for the low status of VET in liberal market economies.

Systems with an employment logic differentiate between vocational and academic education by having separate sectors, but pathways between sectors do not have the same significance because graduates from each sector go to different occupational destinations in the labour market and draw on strongly differentiated knowledge bases. However, employers have a greater understanding of educational programs and of students (mainly young people) who in turn, 'have more contact with

employers and easier access to recruitment networks' (Iannelli & Raffe 2007, p.50). VET does not necessarily signal lower motivation or ability.

It is important not to confuse curriculum with provision in systems with educational and employment logics. While the education systems in coordinated market economies have an employment logic, curriculum in vocational qualifications is broad and includes liberal components that prepare students for citizenship. In contrast, while the education systems in Anglophone countries have an educational logic, their VET systems (at least in Australia and the United Kingdom) are based on industrial models, which are 'functional, workplace focussed and task-oriented' (Guthrie 2009, p.17).

Raffe (2008) points out that, while theories about transition systems and different types of logics are helpful in understanding the nature of social and institutional structures in nations, they are not able to account adequately for diversity *within* nations or between regions and industries and how transition systems change. The skills ecosystems approach helps to account for this diversity and provides a more nuanced analysis (Buchanan et al. 2001). Buchanan and his colleagues (2001) show how different skills ecosystems exist in nations with different logics for the development of skill, the deployment of labour and the relations between social institutions. Skills ecosystems are characterised by 'clusters of high, intermediate or low-level competencies in a particular region or industry shaped by interlocking networks of firms, markets and institutions' (Buchanan et al. 2001, p.21). Skills formation will differ between skills ecosystems, and will result in relations and logics that have looser or tighter links (such as the regulated occupations) between education and work.

In bringing the various elements of this analysis together, we can see that Australia is a liberal market economy and that its education system has an educational logic. This is despite having a competency-based training curriculum in VET: the curriculum reflects the content of the qualification, it doesn't characterise the relationship between the qualification and work, which is regulated by markets rather than by strong corporatist institutions. This analysis helps to account for the low status of VET (including VET in Schools) and the weak links between education and work more broadly. There are some industries (such as in the regulated occupations) where education is embedded in the occupational field of practice and is dominated by an employment logic similar to coordinated market economies, but they will not be identical to the systems in coordinated market economies because they are located in a liberal market economy.

This conceptual framework has been useful in understanding the dynamic of educational pathways in Australia and in understanding the differences between our four industry case studies (finance, primary industry, health and electrical trades/engineering). Relations between education and many occupations in the health and electrical trades/engineering industries are dominated by an employment logic, while relations between education and the finance and primary industries are dominated by an educational logic. This approach provides insights into how we can improve the links between education and work and has implications for policy. One key implication is that a universal policy that treats each field of education and industry as the same will not be effective. More nuanced policies are needed to reflect the skills formation dynamics in different industries.

Student flows between sectors and fields of education

One of the goals of this project is to understand student flows in tertiary education. In earlier work, we noted that most VET graduates do not work in areas directly related to their studies and that there are considerable mismatches between education, skill levels and work requirements (Moodie 2012). We also examined flows within and between fields of education and within and between VET and higher education for people with at least two qualifications in our four industry case studies (finance industry, primary industry, health and electrical trades/engineering) (Wheelahan, Moodie & Buchanan 2012, pp.32—9). In summary, we found that only a minority of graduates get a second qualification in the same broad field of education as their first qualification, although this varies markedly by broad field of education and sector. This suggests a lack of coherence between education, training and work in Australia, which may be illuminated by further analysis of student flows. The ABS Survey of Education and Training was used to extend our previous analysis. (The methods section in appendix A discusses the reasons why this survey was selected.) We do this in three ways. First, we examine changes in flows over time. This is done using the 2001, 2005 and 2009 surveys, while an examination of how flows vary by age groups uses the 2009 survey. Second, we examine how students following different paths respond to questions in the survey about the impact their first qualification had on the kind of job they got or on the job they were in, and we explore their reasons for undertaking a first and second qualification. Third, we use a logistic regression to examine the relative weight of factors that may affect decisions to change fields of education.

Change in patterns of post-school study over time

We can infer changes in the patterns of qualifications in the workforce from the Survey of Education and Training in two ways. First, we can examine total patterns in successive editions of the survey, and, secondly, we can examine differences between age groups within a single, cross-sectional edition of the survey. The first way is illustrated in figure 1. It shows the change in the proportions of the workforce with one, two or three or more qualifications in the 2001, 2005 and 2009 surveys. Figure 1 shows that the proportion of those with no qualification fell from 49% in 2001 to 43% in 2009 and that the proportion of those in the workforce with three or more qualifications increased from 6% in 2001 to 9% in 2009. (These are all statistically significant differences at the 95% level.) There is a clear trend evident towards a more highly qualified workforce, including the holding of multiple qualifications.

Unlike earlier editions of the Survey of Education and Training, the 2009 survey asked individuals the order in which they completed any qualifications if they had more than one qualification. Figure 2 shows the proportions in each age group that have followed each possible post-school educational path by educational sector for up to two completed qualifications. Comparing those aged 25—44 years and those aged over 44 years should tell us about changes in flows over time. Figure 2 shows that those in the 25—44 years age group compared with the older group have: a higher proportion with any qualification (66% versus 55%); a higher proportion with a single higher education qualification (11% versus 7%); and a higher proportion with two higher education qualifications (12% versus 7%). Figure 2 also shows that the two age groups have a similar proportion with a single VET qualification (24% versus 25%) and that there is not much difference between each group for those who completed a higher education qualification first, followed by a VET qualification (4% versus 3%). Overall, these

results, in combination with those shown in figure 1, suggest an increasing trend towards post-school qualifications and for multiple qualifications, with additional qualifications often taken after the age of 24 and an increasing proportion of qualifications in higher education. It seems from the figures here that the increased prevalence of tertiary education study since the 1990s is engaging people across age groups.

Figure 1   Those in workforce with 1, 2 or 3 or more qualifications in 2001, 2005 and 2009 (%)
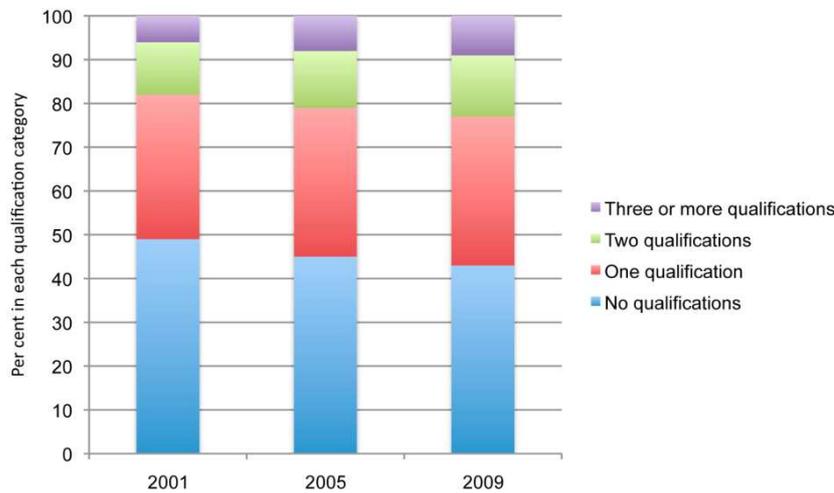
Source: ABS Survey of Education and Training, 2001, 2005 and 2009.

Figure 2   Those within broad age groups who have completed each post-school educational pathway up to two completed qualifications (%)
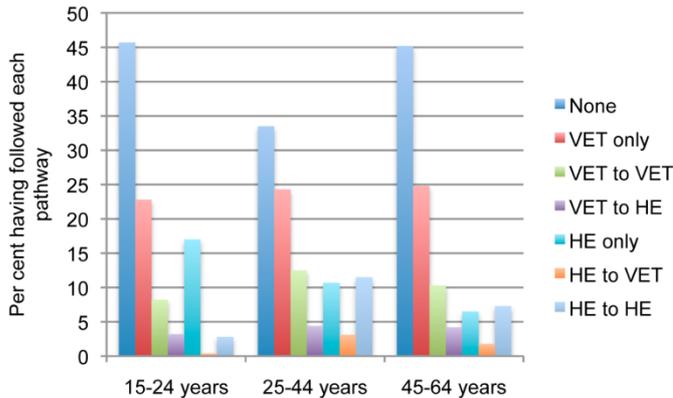
Note: HE = higher education.
Source: ABS Survey of Education and Training, 2009.

We also compared flows by age group and by broad field of education and we examined the destinations of those who undertook a VET qualification first or a higher education qualification first. We used the two age ranges of 15—39 and 40—64 years old, since we found that any finer splitting resulted in considerable errors in the figures, particularly among the smaller fields. The results for each field are shown in table C1 in appendix C. However, the natural and physical sciences field of education and the engineering field of education warrant discussion here because of the differences between them. The natural and physical sciences field is rather different from other fields. It is by far the smallest field in VET (44 000 students) but the fourth largest field in higher education (320 000). An unusually high proportion of VET science graduates get a second qualification (80% of 15 to 39-year-olds) and an unusually high 28.7% get a second qualification in higher education. Higher proportions of higher education science graduates get a second qualification (58% of 15 to 39-year-

olds, although this isn't markedly higher than the 51% for society and culture graduates) and a high 49.8% get a second qualification in higher education. In contrast, engineering is the second largest field in VET, but it is a mid-sized field in higher education. An unusually low proportion of engineering graduates in VET and higher education get a second qualification (27% of VET 15 to 39-year-olds and 30.2% of higher education 15 to 39-year-olds) and an unusually low 3.6% of VET engineering graduates get a second qualification in higher education.

Both the sciences and engineering are empirical and quantitative disciplines. Yet, within the sciences, VET and higher education have markedly different student enrolments and flows. And VET students' enrolments and flows in science are rather different from VET students' enrolments and flows in engineering. These can hardly be due to differences in the disciplines: they surely reflect differences in the labour market for VET and higher education graduates in these fields. In contrast, there are much less marked differences between the sectors in management and commerce, which is the largest field in VET and the second largest in higher education.

Karmel (2011) found that the skill level of jobs worked by holders of VET diplomas decreased between 1996 and 2006 and concluded that the diploma was losing its value as an entry-level qualification in favour of degrees. Similarly, we have found a general trend towards higher education and multiple qualifications, but also that these patterns have played out differently for different fields of education in ways that appear related to changing labour market conditions and regulatory structures.

Reported impacts of and reasons for study

The second method used in this chapter is a descriptive examination of respondents' answers to questions about the impact of a first qualification on getting a job or on the job they already have, and their reasons for undertaking their first and any second qualification. These responses were split both by the type of educational pathway they undertook, and, for those who had completed at least two qualifications, by whether they changed field of education between qualifications.

Survey respondents were asked to nominate one of a list of impacts on work of their first qualification. Table 2 summarises the responses for impacts that were most notable (see table C2 in appendix C for the full results). It shows that the impact of a first VET or higher education qualification chosen by most respondents was assisting them to begin a new career (28.9% of graduates chose this as an impact), with this impact much more common for higher education graduates (at least 45%) than for VET graduates (at the most, 33%). This impact was stronger for higher education graduates getting a second qualification. The second highest response was that the 'Qualification had no impact on [their] working life', which was chosen by 23.6% of respondents. The third highest response was that gaining their first qualification enabled respondents to perform the same job at a higher standard or undertake additional duties. This was more frequently chosen by VET graduates, presumably because more were studying while already in their career job. For all the impacts, the frequency of choosing the impact differed relatively little by whether the respondent changed field of education but varied much more by their initial sector and whether they changed sector.

Table 2   Percentage stating impact of first completed qualification on working life by those with one qualification in VET or HE, those with two qualifications in VET or HE, and those with one qualification in each sector (respondents permitted to cite one impact on working life)

Impact	VET only	VET to VET	VET to HE	HE only	HE to VET	HE to HE	Total*
Assisted respondent to perform same job to a higher standard or undertake additional duties	*26.9*	*27.6*	*20.1*	*7.6*	*10.8*	*7.2*	*20.0*
Same field	NA	28.4	20.8	NA	13.0	7.2	19.2
Changed field	NA	26.9	19.4	NA	9.9	7.1	17.9
Assisted respondent to begin a new career (i.e. get a different job in a different field)	*20.7*	*24.2*	*33.0*	*36.3*	*50.3*	*46.3*	*28.9*
Same field	NA	23.7	34.1	NA	50.3	46.5	33.9
Changed field	NA	24.7	31.7	NA	50.4	46.1	34.3
Qualification had no impact on working life including permanently unable or not intending to work	*19.7*	*27.2*	*30.9*	*15.1*	*27.1*	*34.2*	*23.6*
Same field	NA	25.9	31.2	NA	26.4	32.4	29.2
Changed field	NA	28.4	30.5	NA	27.4	36.2	31.1

Notes: * Includes those in pathway category 'not determined' not otherwise shown.
Source: ABS Survey of Education and Training, 2009.

Survey respondents were asked to nominate their reasons for studying each qualification they had completed, with multiple responses allowed. Table 3 summarises the most notable results for respondents' reasons for undertaking a first qualification, with the full results given in table C3 in appendix C. By far the most common reason respondents gave for undertaking their first qualification was to get a job, with 57.4% of respondents nominating this as a reason. The proportion was markedly lower for VET graduates, possibly because a higher proportion was already in a career job. The next most common reasons for undertaking a first qualification were for personal interest or enjoyment (given by 26.7% of respondents) and to improve general education skills (24.2%). While these non-vocational reasons are less common for VET graduates, there were still about a fifth of VET graduates with only one qualification who gave these reasons. Given the policy prominence of VET to higher education pathways, it is noteworthy that the highest proportion of those who said that they undertook a first qualification as a study prerequisite for a second qualification was those who undertook the VET to higher education pathway. However, this was only 13%, suggesting that there is a low level of premeditation of pathways generally. Again, whether students changed fields of education had little impact on the reasons they gave for undertaking their first qualification, whereas being a VET or higher education student had a bigger impact, as did changing their sector of education.

Table 4 summarises the most notable results for the stated reasons for a second qualification, with the full results given in table C4 in the appendix C. There are a number of differences with the results for first qualifications shown in table 3. There is a more even spread of reasons and less difference between graduates who started in VET or higher education. Changing fields is correspondingly associated with larger differences in the reasons chosen. The most common reason for undertaking a second qualification was to get extra skills for a job (32.6%). Higher proportions of graduates who completed a second qualification did so to improve their general educational skills or for personal interest or enjoyment.

Table 3   Percentage citing selected reasons (multiple choices) for undertaking their first qualification, by pathway and whether field had changed or not between qualifications

	VET only	VET to VET	VET to HE	HE only	HE to VET	HE to HE	Total*
To get into another course of study	*4.1*	*6.6*	*13.0*	*4.8*	*6.3*	*8.7*	*5.9*
Same field	NA	7.8	14.0	NA	2.0	9.6	9.6
Changed field	NA	5.3	12.0	NA	8.1	7.8	6.8
To get a job	*54.1*	*45.8*	*53.1*	*74.6*	*69.5*	*66.4*	*57.4*
Same field	NA	43.2	55.6	NA	70.1	67.6	54.1
Changed field	NA	48.2	50.3	NA	69.2	65.0	55.9
Was a requirement of job	*20.2*	*22.4*	*15.1*	*7.3*	*7.1*	*7.0*	*16.1*
Same field	NA	22.5	14.1	NA	5.5	6.6	15.2
Changed field	NA	22.3	16.3	NA	7.8	7.6	15.3
Wanted extra skills for job	*20.3*	*19.5*	*13.2*	*9.3*	*9.1*	*7.9*	*15.8*
Same field	NA	21.9	13.5	NA	11.2	7.4	15.1
Changed field	NA	17.2	12.9	NA	8.2	8.5	13.3
To try for a different career	*9.1*	*9.0*	*8.7*	*9.1*	*6.4*	*5.4*	*8.6*
Same field	NA	8.1	8.1	NA	2.8	4.2	6.6
Changed field	NA	9.9	9.4	NA	7.8	6.6	9.0
To improve general educational skills	*18.6*	*21.9*	*23.7*	*32.1*	*33.6*	*34.4*	*24.2*
Same field	NA	23.6	20.1	NA	39.1	33.4	26.6
Changed field	NA	20.3	27.6	NA	31.3	35.4	26.6
For personal interest/enjoyment	*21.8*	*23.1*	*24.4*	*37.7*	*31.8*	*33.7*	*26.7*
Same field	NA	21.9	24.5	NA	25.4	30.1	25.6
Changed field	NA	24.3	24.2	NA	34.4	37.5	29.2

Notes: * Includes those in pathway category 'not determined' not otherwise shown.
Source: ABS Survey of Education and Training, 2009.

Harris, Sumner and Rainey (2005) found similar results from questions on reasons for study in their survey of South Australian tertiary students commencing in 2003 who had either commenced in VET with previous experience in higher education or commenced in higher education with previous experience in VET. They found that considerably more VET commencers were studying due to employer requirements; that retraining for a different career was somewhat associated with moving into higher education; that gaining skills and improving prospects in a current career was somewhat associated with moving into VET study; and that educational and interest reasons were prevalent among both groups if more widely expressed by those moving into higher education. Our results, as well as those of Harris, Sumner and Rainey (2005), suggest that motivations for further study are somewhat different among those entering higher education and VET but not greatly so and there were smaller differences in reasons for undertaking a second qualification. Our results also suggest that an intertwining of educational and labour market factors influence students' choice of sector, field of education and subsequent study, with the labour market the most important factor overall and for individual choices.

Table 4   Percentage citing selected reasons (multiple choices) for undertaking their second qualification, by pathway and whether field had changed or not between qualifications

	VET to VET	VET to HE	HE to VET	HE to HE	Total
To get into another course of study	*6.9*	*7.7*	*5.3*	*6.1*	*6.6*
Same field	7.8	5.2	3.4	6.6	6.6
Changed field	6.2	10.4	6.0	5.5	6.5
To get a job	*23.5*	*34.4*	*22.5*	*38.6*	*29.0*
Same field	23.8	29.8	26.4	33.7	27.4
Changed field	23.1	39.5	21.0	43.6	30.4
Was a requirement of job	*22.3*	*9.5*	*21.3*	*14.1*	*17.7*
Same field	21.6	10.3	19.8	15.9	18.0
Changed field	22.9	8.7	21.9	12.2	17.5
Wanted extra skills for job	*34.4*	*30.3*	*31.0*	*30.8*	*32.6*
Same field	38.0	36.0	37.7	34.4	36.9
Changed field	30.9	24.1	28.3	27.1	28.7
To try for a different career	*16.2*	*21.4*	*18.4*	*14.9*	*16.7*
Same field	12.2	11.2	14.8	9.5	11.3
Changed field	20.0	32.7	19.9	20.5	21.6
To improve general educational skills	*26.3*	*34.9*	*22.7*	*34.6*	*29.7*
Same field	27.2	33.2	30.5	37.9	31.8
Changed field	25.5	36.7	19.5	31.1	27.7
For personal interest/enjoyment	*24.0*	*36.5*	*26.3*	*31.8*	*28.7*
Same field	20.7	32.5	21.4	31.0	26.7
Changed field	27.3	40.9	28.3	32.7	30.5

Source: ABS Survey of Education and Training, 2009.

Relative weight of impacts, reasons and fields in field-changing

The above results suggest a complex interplay of fields of education, educational pathways, impacts on work and reasons for undertaking qualifications. Binary logistic regression was used to examine this interplay further. This is a technique for modelling the probability of one event occurring with respect to another and gives the relative weight of factors associated with such an occurrence. For the purposes of this chapter we modelled whether or not people with at least two qualifications changed fields of education when they moved from their first to second qualification. We examined the effects of whether or not students were aged 25 years and over, the impact on work of a first qualification, the reasons given for undertaking each qualification and the fields of education of each qualification. Regressions were performed for all those undertaking two qualifications overall, and for each pathway separately. The results, given in table C5 in appendix C, give the odds ratio for each regression for each factor that proved significant. The odds ratio indicates the extent to which the odds of changing fields of education are increased if the factor is 'true' (all factors in this case being dichotomous variables), controlling for other variables (for example, how much such odds increase if a respondent indicated the 'to get a job' reason for their first qualification, regardless of other responses). The notes to this table give details on the significance and fit of the regressions and why it was necessary to give results for each field of education measured against a reference field (which was commerce and management, chosen because it had the least field-changing in all pathways).

The logistic regression indicated that the impact of the first qualification on work did not have a significant effect on changing fields of education. Nor did the reasons students gave for undertaking a first qualification, with one exception. Undertaking the first qualification to get into another program did have a significant effect on changing field of education (and this effect was not significant when

the analysis was split into different types of educational pathway). Labour market-related reasons for undertaking a second qualification had effects on changing field of education that were statistically significant but relatively small. The labour market reason for a second qualification with the largest effect was that of attempting to start a different career, which increased the odds of changing field of education by 2.0 times overall, and 3.0 times for those undertaking the VET to higher education pathway. By contrast, the regressions confirmed that students were more likely to change field of education if they started in some fields compared with others. Overall, the effect of studying a first qualification in the society and culture field of education increased the odds that students would change fields 1.6 times, whereas it increased by 6.6 times for those studying in food and hospitality. The effect of the second field of education in which students studied was also marked: those studying engineering as their second qualification were less likely to have changed fields of education than those studying management in their second qualification. However, those studying in the management field of education as their second qualification were less likely to have changed fields of education compared with those studying in education. VET engineering graduates who later undertook a second VET qualification didn't change fields of education very much, and nor did VET health and education graduates who later undertook a second qualification in higher education, which probably reflects the particularly well-defined pathways in the regulated professions and trades. However, those VET graduates who undertook a second VET qualification in education were quite likely to move field of education, which may reflect a move into VET teaching from initial VET study in another area.

Conclusions

This chapter examined quantitative aspects of tertiary student pathways and how field of education, educational sector and labour market considerations appear to be related. It found that pathways vary considerably by age, suggesting changes over time in patterns in tertiary education towards greater participation overall, more multiple qualifications and a larger proportion of higher education qualifications in all tertiary qualifications. It also found that flows varied considerably by field of education in ways related to labour market conditions. A regression model of whether students changed field of education between first and second qualifications found that the field of education in which students undertook their first qualification had the largest effect on whether they changed field of education for their second qualification. Tabulations of responses on the impact of a first qualification on work, reasons for undertaking first and second qualifications and whether or not students changed fields between qualifications for each pathway revealed a number of associations that suggested both distinctions and overlaps between VET and higher education and an intertwining of educational and labour market factors, even if the latter may be dominant and overarching. It may be that overall labour market impacts and considerations shape choices about whether to study in VET or higher education and the additional qualifications that people need to pursue an occupational pathway, while the field of education initially chosen shapes the probability of whether or not the field will change with any succeeding qualification.

Students and graduates say …

This chapter reports the results of interviews with 31 students (22 in VET and nine in higher education) and seven graduates (four VET and three in higher education) in the four case study industries in the project (finance, primary industry, health and electrical trades/engineering). The selection of interviewees is described in appendix A and their profile is given in appendix B.

The quantitative analysis in the previous chapter demonstrated that students' reasons for undertaking an initial and subsequent qualification are complex. While work-related reasons are dominant, other reasons such as improving educational skills and personal interest and enjoyment were also identified. However, while quantitative analysis can demonstrate relationships, qualitative analysis is needed to understand the meaning that students invest in what they do and to add depth to our understanding of the relationships identified in the quantitative data (Sayer 2000, p.17). The interviews were semi-structured, which allowed interviewees scope to elaborate on their responses and for interviewers to pursue important issues with interviewees. The purpose of the interviews was to identify illustrative examples and offer insight into the possible mechanisms behind the relationships reported in the previous chapter rather than to provide a representative sample that could be extrapolated to the population at large.

This approach was able to identify the complexity of students' motivation, the strategies they use to achieve their goals, their experiences and the factors that facilitate or impede their progress. While 'getting a job' is students' and graduates' central concern, this is part of their broader priorities, values and desires for the future. The interviews show the way students' and graduates' strategies take account of their individual circumstances, capabilities and self-perceptions. They also show the way their goals are mediated by the institutional realities of the institutions in which they study, the nature of the industries they are seeking to enter, the relationship between their educational institutions and the workplace, the quality of the workplace where they undertake placements, and the way these factors interact with the reality of their own lives, obligations and responsibilities. In some cases, students and graduates offered helpful advice on how institutions could improve their experiences.

Trajectories and motivations

The students and graduates interviewed as part of this project were from a variety of backgrounds and ages. Of the 31 students, 16 were aged 25 years and over and 15 were aged under 25 years. All but one of those aged under 25 years intended to undertake further study, while ten of those aged 25 years and over intended to do so. Most students were planning on higher-level study in their field. All seven graduates intended to do further study, but three intended to take short targeted programs.

Students' reasons for wanting to undertake further study are related to the reasons why they embarked on study in the first place. While getting a job was at the centre, this was interwoven with their priorities, values and circumstances more broadly. It wasn't just any job students wanted; it was the job that was associated with their program. Most students saw themselves working in the same field in five and ten years time. One nursing student reflected the views of other students saying, 'This is my area. In five years time I will be a nurse. In ten years time a nurse. I will be a nurse until I retire'. Students undertaking accounting and finance programs saw their field in broad terms, which included management and other aspects of the finance industry, but also included related areas such

as marketing. One student explained he could apply 'for graduate programs in companies and maybe try some different things that way'. The agriculture students also saw their field broadly; this included farm and land management but also areas such as agronomy, with one student wanting to pursue a PhD. The degree graduates from engineering saw themselves working in the field and this included management, but also areas such as 'alternative energy, aspects of environmental engineering and software engineering'. All the young men undertaking engineering associate degrees saw themselves in the same or related fields in five years time, but when asked to think about ten years they also included living independently and being well established in their career.

Some students indicated that they were bored and couldn't see themselves spending years in the same job. After working in low-level positions in retail, hospitality or finance they recognised that they needed a qualification to get interesting work. Others started their current program after working in other areas. Personal experiences set many on their path, particularly the women doing the certificates III in aged care (personal care attendant/home and community care), or the diploma of nursing. For example, one young woman left school at the end of Year 10, describing herself as a trouble maker. She had trained and worked as a mechanic, but 'needed something different'. She decided she wanted to become a nurse after an experience of being in a hospital. She is studying a nursing diploma as a first step before moving to the degree. She juggles this with part-time work and looking after her two young children, and felt that she was setting a good example for them.

A mature-aged apprentice was prepared to do whatever it took to achieve his goal. He was a qualified engineer but had always wanted to be an electrician. He had a rough time as an early school leaver and young adult, and he tried for many years to convince an employer to give him an apprenticeship. When he finished his engineering degree in his mid-20s, he set up his own firm and then employed himself as an apprentice, under the supervision of a qualified tradesperson. In another example of perseverance, a young electrical trades apprentice had to convince his mother to allow him to commence an apprenticeship since she wanted him to do a degree so he wouldn't 'waste' his excellent senior school certificate results. Ideally, he wanted to study the electrical trades and engineering at the same time, but this option isn't available.

Many women found their experience of studying to be transformative. It was an opportunity to change their lives (including sometimes their personal relationships), develop greater self-understanding and work towards goals. One woman explained that the certificate III she completed 'opened my eyes. I now have a different lifestyle and a different attitude'. One higher education nursing graduate said that she wanted to undertake postgraduate study 'so I can get a senior position. I feel like going all the way. Didn't think I would … I just want to keep going'. She said that she had been unhappy in her job and personal life for a while, but she had now 'started being in charge and making changes'. A number of women explained how they had to be encouraged, supported or cajoled to undertake further study because they didn't think they could. They got support from family, friends, managers and teachers. Teachers suggested higher-level studies and provided information about courses and how to apply.

While many of the women were explicit about the transformative experience of education, some of the men described intentions that could be regarded as transformative. For them, undertaking their qualification was a means to get to where they wanted to be and change. A male accounting student

said 'it would be a personal milestone' to get a degree. One older man doing a diploma of agriculture didn't really need his qualification because he'd been able to advance without it, but that:

> Maybe [one reason for doing the diploma is] because I didn't advance too far in earlier years and did the fruit picking for so long and later realised I had the potential to do a lot more academically. I guess I'm testing myself, and what I know about the industry.

A number of students had trained overseas and found their qualifications weren't recognised. Some were studying programs at the same or higher level as their original qualification, but there were a number doing programs that would lead them to less skilled occupations. Recognising existing skills through qualifications was also addressed by two agriculture students, who said that their studies were important because they recognised the skills they already had. While these reasons may appear on the face of it to be simply utilitarian, the way students told their stories showed that completing their program was also part of their self-realisation.

Family responsibilities and life events helped shape students' and graduates' decisions about employment and study, particularly those who were older. One father waited until his children were older and more independent before embarking on a career change. Responsibility for young children was a factor for a number of the mothers. Health, their own or other close family members, prompted a career change or restricted opportunities.

The value of pathways

Concern about the opaqueness of pathways between VET and higher education and the difficulties traversing them have led to government commissioned reports to find solutions (PhillipsKPA 2006, 2010; Bannikoff, Symonds & Doolette 2009). While the students we interviewed did not always have a clear understanding of how pathways work, they were nonetheless familiar with them and valued them. They said pathways provided opportunities for: early school leavers; those who couldn't get jobs; those re-entering the workforce after raising families; those in low-level jobs or those simply unhappy in their current job; and school leavers who needed a higher score to enter their program. They also saw pathways as helping build their confidence and the capacity they needed to study at a higher level. Most of the students had already undertaken prior studies (complete or incomplete) before starting their current program. All students aged 25 years and over had prior study experience, as did eight of the 15 students aged under 25 years. All but one of the mature-aged graduates had studied at least one program before their most recently completed program (all in VET). However, we explicitly sought students and graduates who had experience of prior study so we could find out about their understanding of pathways and their experience of transition.

Students were using pathways for two key reasons: the first was because they needed to gain the credentials to enter a higher-level program, and the second was to build their confidence in their ability to study (and often both). One young associate degree student demonstrated a sophisticated understanding of how to make pathways work for him. He could have entered straight into an engineering degree, but not the one he wanted because it had a high cut-off Australian Tertiary Admissions Rank (ATAR) of 91.4. His associate degree provided a guaranteed place in his chosen degree. In fact, all four associate degree students were aged under 25 years and were using their current program as a pathway to an engineering degree.

Developing confidence was important to many, as well as gaining credentials for higher-level study and this is why they valued pathways. One young woman doing a diploma wanted to do a degree in agricultural science, but it seemed 'way beyond my realm'. A male student doing a certificate IV

explained that he 'decided to warm up' first before going to the next level. Many interviewees (young and old) had dreadful experiences at school and were building their confidence by using their current qualification as a pathway.

The experience of transition

Many factors contribute to students' experiences of transition from VET to higher education. Students are often older, have more complex and demanding lives, and face personal, social, cultural and pedagogic hurdles when they transfer (Laanan 2007). This includes different teaching styles, larger classes, lower contact hours and levels of support, higher academic standards, and expectations of more independent study. There are often difficulties with not knowing how to access resources or what to expect, time management, study skills, motivation, finances and managing work and family. These factors mediate students' experiences of transition between sectors.

Consequently, the level of preparation and support students receive in their original program is important, as is the transition support they receive in their destination program. Some students we interviewed felt well supported for higher-level studies, while others did not. For example, one student said, 'I would advise TAFE students transferring to uni to be prepared for a much higher workload. Uni doesn't have teachers — you have to work out problems yourself'. Another explained that, while she had completed a certificate III, she didn't know what was expected of her at university, even how to borrow a book from the library.

The students undertaking degrees referred to the different type of learning and assessment expected of them in higher education compared with TAFE and the need to be more independent and develop good study skills. Most (but not all) found their degree challenging but valued the practical work they did in TAFE. Three students thought an orientation program would help students moving from VET to higher education, including a session on how teaching differs between the sectors. Two diploma students had prior higher education studies and said this helped them in their current studies. The associate degree students were undertaking a higher education qualification and felt that their studies were more complex and conceptual, requiring more independent learning than students undertaking diplomas in the same field (who sometimes shared the same classes). One diploma student said she wasn't prepared for the commitment, while another felt she wasn't prepared, but that this was her responsibility. Those undertaking certificates IV and III had varying experiences. Those with prior experience working or studying in the field overseas found studying wasn't too difficult, although a couple had trouble with learning appropriate English terminology. Those who had done well at school did not find their studies challenging. Other certificate students did find their studies challenging, and several found it difficult to find time for their families.

Students' views on credit for prior study were mixed. Some didn't have an issue at all. Others said that they could or should have received more recognition for previous studies. One student's sequence of study was an advanced diploma, followed by a trade certificate III, then a degree. He was happily surprised with the amount of credit he got in his degree for his prior VET studies, but not with the credit he got in his certificate III for the advanced diploma. Another student almost completed a degree in accounting in her country of birth but she received only a few credits towards her Australian qualification, explaining that she had to start from the beginning. In contrast, one student said that he received too much credit, which made his higher-level study difficult. Two students in the financial/ accounting field could have applied for credit, but chose not to, with one saying that some things were different so it was better to start from scratch. For one student, gaining credit meant it

was hard to patch different subjects from first and second years together to make a workable timetable.

Getting the right information when it was needed was critical for good transition experiences. Some students reported that they had no problem finding the information they needed about the programs they were interested in and how to apply for them, saying that the information on the internet was good. A number of certificate students said they wouldn't be in their program if it wasn't for the information and support they'd received from their teachers. Getting the right information at school was a problem for some young students, whereas others were on their current track because of excellent advice they received from teachers. One student who came straight from school did not have the prerequisites he needed to get into his chosen degree and was doing an associate degree instead. He had needed advice in Year 10, not Year 12, which was when he got advice, to ensure that he undertook the right subjects in his senior school certificate. There were students in all fields of education who said they needed information about how to get to the next step in their educational pathway; they understood the purpose of pathways, but not necessarily how to access them. A student explained that he did not find out until the second year of his program that he needed a grade point average of three to get to the next stage. For others, the issue was how to find work once they had achieved their qualification and where the employment opportunities were.

Work placements and other forms of work-based learning

The second chapter of this report differentiated between qualifications with an 'employment logic' and those with an 'educational logic'. The former has closer connections between education and work, as the qualifications are embedded in work, thus providing students with a greater understanding and experience of their intended occupation and the opportunity to build relationships with potential employers. In contrast, qualifications with an 'educational logic' have weaker connections between education and work, and occupational outcomes are less well defined. The interviews explored students' and graduates' experiences of work placements and work-based learning and found that, while they benefited from strong relationships between education and work, the complexity of their lives and the nature of workplaces meant that experiences were variable. Students value work placements but there are difficulties that need to be addressed by institutions and workplaces to strengthen the links between the two and improve students' experiences of transition.

The four fields of education varied in the extent to which they included work placements or other forms of work-based learning in their programs. Work placements are mandatory in nursing and care work and are a core component of apprenticeships in the electrical trades, while work projects are required in training to become an engineer. The agriculture and the finance industries don't mandate work placements (apart from apprenticeships and traineeships in those fields); however, students had stronger or weaker relationships with work, depending on their personal circumstances.

Students and graduates valued work placements because they consolidated classroom learning, built confidence and allowed them to understand the nature of their chosen occupation. They did not link the value of work placements to the development of general workplace skills and in part this was because most had prior or current work experience in part-time jobs, often in areas unrelated to their studies. Rather, they valued work placements because they immersed them in their chosen field.

However, their experience of their work placements varied depending on where they worked, the staff on their shift and the support they received. One graduate explained 'Most nurses are good, but some say: "oh you're in second year, you should know"'. A qualified personal care attendant (PCA)

who was employed as a trainee enrolled nurse in a nursing home said that he was not getting enough opportunities to consolidate the work he covered in class at his workplace because he was 'flat out doing PCA duties'. Work placements do not always expose students to good practices. One aged care student said that 'sometimes staff are not listening, not following procedures'. She found that it was helpful to share these experiences in class, which from a pedagogic perspective means that they are exposed to critical review. There were concerns about the organisation of placements the institution found and allocated. Parents found it difficult to juggle jobs, children and placements. Some lost part-time jobs to do the placements.

The VET students studying agriculture already had full-time jobs in that field and were very enthusiastic. The program is individualised and the teacher visits them in their workplace. It was difficult for students to attend classes because of the travel time and the need to take time off work. In contrast, the degree students in agriculture were not required to do work placements but thought they would be helpful.

The concerns of the electrical trades apprentices were different. One had been delegated by fellow apprentices to express their concerns that all training was going to be on the job and that their on-campus studies at TAFE would cease. It wasn't clear how they came by such information, but their concern was for a balance between on- and off-the-job training. The four associate degree engineering students were studying full-time and didn't have structured work placements but they were required to complete an engineering project in the second year of their program as a capstone subject, either in cooperation with industry or in a simulated environment. However, they thought placements (particularly over summer) would be helpful for later getting a job and for deepening their understanding of their field. Students undertaking the engineering degree participated in an industry affiliates program and were required to undertake the industry experience specified by Engineers Australia.

While there were no mandatory work placements in the accounting and finance programs, some students were already working in the same field as their program and this helped them at work. For example, one accounting student said that when his employers 'knew I was serious about my studies they channelled my promotion from administration assistant to accounts assistant'. Another accounting student combining work in the field and study said that, while this had benefits, it also made life stressful because of having to juggle work and study.

Some students who worked in the same field as their studies said their employers were flexible. Students who were working part-time in a completely unrelated field (such as in a supermarket) had variable experiences. Juggling work and study was a theme that came through very strongly. Many students were working, were parents and were studying. They reported a high level of stress trying to manage, and this was made worse when they couldn't plan effectively. Some stopped their paid employment because they found the combined workload unmanageable. This is clearly an issue that needs to be addressed in organising work placements.

Conclusions

Students' and graduates' insights help us make sense of the data in the previous chapter. While getting a job is a key motivation, it is also a defining feature of students' identities, or the identities they want to create for themselves (Billet & Somerville 2004). However, engaging in educational pathways also involves a high personal cost for many in sustaining study and making transitions between qualifications and educational sectors, and from education to work (Field 2006). Understanding the nature of

students' experiences is important in framing policies that seek better links between education and work, and for institutions and workplaces in constructing supportive environments that take account of the complexity of students' lives. These issues are considered in the next chapter.

Institutional perspectives

This chapter reports the views of 17 teachers/academics and 13 managers, learning advisors and pathways officers. It also draws on the insights of four researchers from the United Kingdom engaged in similar research. The interviews add to research on pathways and student transitions because, as well as identifying problems in organising pathways as a consequence of tertiary education policies and fraught relations between VET and higher education, interviewees related educational pathways to occupational progression and to the structure of the labour market and discussed relationships between educational institutions and workplaces. Interviews show the way staff try to mediate students' experiences of transition between qualifications and sectors and from education to work, while taking students' complex lives into account. In particular, staff show that not all workplace learning is positive, and this raises issues for policy, employers and institutions that are not usually raised because workplace learning is taken by definition to be positive.

Pathways and social inequality

Teaching staff have very good insight into students' reasons for undertaking pathways and their experiences of them. In many cases teachers had followed a similar trajectory and this gave them insights into students' lives and their challenges. They particularly understand students' need to build their confidence and capabilities as well as needing higher-level credentials.

An issue rarely discussed in the literature is the length of time it takes students to complete a pathway and the challenges they have in doing so when faced with the complexity of their lives. This was a significant issue for teachers we interviewed, particularly for those who had done it themselves. Students who are working, studying part-time and have families face big hurdles. Many just do not complete, despite their best intentions. The engineering teachers explained that many tradies want to go on, but find it impossible and are able to earn reasonable money without further qualifications. However, they are limited in their choices by not following a pathway, and the industry doesn't get a flow-through to more skilled and senior roles. Pathways can also seem endless for young people. One participant explained that 'Pathways are being used by working class kids. They do a bit here and a bit there. It takes them a long time to get anywhere'.

Despite this, teachers and managers valued pathways because they provide students with opportunities for further study and higher-level work. In an ideal world, pathways were seen to support occupational progression and meet emerging industry needs, including skill shortages. Industry benefited from having workers who were graduates of both sectors because they had practical skills combined with theoretical knowledge. For example, one agriculture teacher explained that 'I think they make better ag scientists if they have practical farming skills and knowledge (even simple things like when to shut a gate)'.

Staff thought pathways had a range of other benefits when they were working well. They help to achieve government targets for higher-level qualifications and could improve efficiencies in funding. Second, pathways could benefit all participating educational institutions by providing flows of students to the receiving institution and improve the status of the courses in the institutions sending students to higher-level qualifications because pathways are valued by the destination to which they lead. They also help to cut marketing costs and support the integration of educational sectors.

However, the international researchers we interviewed warned that pathways should not be seen as a panacea. They are not able to address all existing inequalities in educational opportunities and employment outcomes. Inequalities in opportunities are established well before students reach the point of considering their options for tertiary studies and employment. Pathways expand the opportunities available to individuals but they do little to change the structures that link both educational and employment opportunities to socioeconomic status. The creation of strong formal educational pathways will not necessarily change patterns of occupational progression. Pathways could not support occupational progression when occupational pathways did not exist.

Establishing and maintaining pathways

Pathways are easier to develop within sectors than between them. This reflects the occupational structures aligned to qualifications in each sector. There is as much of a sectoral distinction between the professions served by higher education and the occupations served by VET as there is between the educational sectors. Professional bodies and skills councils have very little to do with each other. Few sit on boards in the other sector, and while efforts to collaborate in developing each other's qualifications have increased, there is a long way to go. Interviewees explained that it is also easier to develop pathways within sectors because there is greater alignment in the structure of curriculum between qualifications. For example, a higher education diploma or associate degree has the same approach to knowledge as a bachelor degree. Research shows that this is one reason why TAFEs and private providers want to offer higher education qualifications, because it improves coherence between qualifications (Wheelahan, Moodie & Billett 2009; Wheelahan, Moodie & Buchanan 2012).

Some interviewees thought the disparities in status between VET and higher education were reflected in the way pathways were developed: access to pathways is bestowed by the higher-level program, while those in the lower-level program are expected to organise them and ensure students are academically prepared to study at the next level. A similar sense of hierarchy is evident within VET if programs at different levels are located in different departments, and between TAFE institutes and schools that offer VET in Schools. VET in Schools students were often seen to be underprepared for higher-level VET. Some VET participants felt that the idea that pathways can provide a feeder of students for higher-level programs seemed to be better appreciated by VET staff than higher education staff. However, there are higher education staff who strongly support the development of pathways.

Support for pathways may be built if the institution has a pathways officer whose job is to broker pathways between institutions and sectors. However, developing and maintaining pathways requires intensive human and other resources and, as one VET manager explained, the best arrangements are produced when resources are invested in the process. Another VET manager reported that agreements were often established between the heads of institutions but to get any 'traction' (you need) 'content experts, teachers and lecturers around a table'. The role of non-teaching specialists was underappreciated: they could often help to construct pathways to support students' transitions (for example, selection of subjects, sequencing, and additional support).

Funding and policies for competitive markets in tertiary education were widely cited as obstacles. One senior VET manager who is a champion for pathways said that 'management attention on pathways is near zero unless it is made a funding requirement, even though it may be good for students'. Partnering worked when it brought in additional money or new markets, and VET in Schools was particularly important in helping to maximise hours. One teacher and one manager from different institutions were concerned that articulating students meant a loss of funding. For example, first year is relatively cheap to run in nursing. The second and third years are more expensive because they

contain longer work placements. This creates a disincentive to take on too many articulating students. There is a tension between the expectation that education institutions will collaborate in areas like pathways but compete for students. One senior manager explained, 'That will erode the premise of pathways all the way through because then it becomes a student grab rather than a student enabler'. On the other hand, pathways can help provide institutions with students they would not otherwise have had.

Relations between the sectors

There were marked differences in the nature of VET—higher education relations within and between the institutions we examined, but the sectoral distinction was still a structuring factor in relationships and perceptions. In one institution that offered both VET and higher education, the programs were developed and delivered in one department with staff teaching across the different levels. This was in a field of education with very high levels of articulation and without great differences in occupational destinations for VET and higher education graduates, so when this institution started offering degrees it was a natural progression to develop programs that went from VET to higher education. In another institution that offered both, VET and higher education were separated, with minimal contact between staff, at least in the field we examined. Despite the disjuncture, there was a strong pathway, with a large group of students transferring from VET to higher education each year because the occupational pathway was strong. There was a strong relationship between one higher education institution and a neighbouring VET provider, with a number of students moving from higher-level VET qualifications (but not necessarily trade qualifications) into the degree. This was in a field of education where there isn't a lot of articulation, but very strong institutional relations between the two supported by the higher education pathways officer. However, even though the numbers were good, comparatively speaking, they were still substantially fewer than other fields of education. In another region, the higher education and VET providers had almost no contact and there were very few articulating students. This field of education was in an industry with very few occupational links between lower- and higher-skilled occupations.

Many VET staff still felt that universities dismissed what they did, and didn't understand or value VET. Apart from the institution where teachers were in the same department and taught both VET and higher education, the teachers didn't really know each other, particularly those in separate institutions. Some trade teachers said they would like to pick up a phone and suggest a student to their higher education counterparts, or find out how their students were going, but they didn't know anyone. One said that 'what doesn't work well is the transition from TAFE to university for the simple reason that universities don't accept TAFE qualifications — they think they can do it better'. Another said that conversations could be frustrating and 'actually personally insulting' unless they were dealing with someone who had a good understanding of both sectors. Some higher education staff in turn raised industrial difficulties and concerns that teaching would be contracted out to TAFE. However, there were in many cases strong relationships between particular VET and higher education institutions or departments, which were due to the efforts of one or two individuals. Staff who have the experience of working in both sectors can help to create good relationships.

It is important to go beyond the traditional focus on the relationship between VET and higher education in thinking about pathways and to consider also that between schools and VET. The significance of VET in Schools has increased and this brings many VET providers and schools into constant contact.

One VET manager said that schools were under pressure to retain students at school as a way of meeting government targets and retaining funding. He explained:

> so the pathway thing doesn't actually provide a pathway at all. It is just a method for that institution or that organisation to manage their funding peculiarities — whatever they are, and the pathways thing becomes more about a means for solving those issues.

The perception of some VET teachers about VET in Schools was often negative, particularly when it was delivered in the school by the school itself without taking into account the actual pathways that such provision would make possible for students. Some VET teachers also felt that schools valued academic education and had a low opinion of VET. Staff in both VET and higher education expressed concern about the preparedness of school leavers, and contrasted their attitudes with those of older students.

Are students ready to study at the higher level?

A concern of all participants was ensuring that students were adequately prepared to study at the next level. This included those going from school to VET, as well as those going from VET to higher education. Some VET and higher education participants said students' preparedness depended on where they completed their training, expressing the concern that the quality of training is becoming increasingly uneven. More broadly, there were mixed views on whether VET graduates were adequately prepared for higher education. An accounting teacher said that diploma students were better prepared for the degree, whereas students from the Victorian Certificate of Education take time to adjust to the new environment. Others felt that students going from diplomas to higher education needed extra support, but that they would make it in the end (see also Wheelahan, Moodie & Billett 2009; Wheelahan, Moodie & Buchanan 2012).

Two issues arose which had quite a lot of agreement across sectors. The first was about competency-based training (CBT), which is the mandated model of curriculum in VET, and the second concerned mathematics. Many VET teachers felt they were constrained by competency-based training, and many higher education teachers agreed with them. The issue was broader than pathways. Teachers discussed whether VET's role was to support students to become lifelong learners (most argued it was) and whether they had the knowledge they needed to go further in education and in their job. Two specific concerns were expressed about competency-based training. The first was whether it sufficiently engaged students with theoretical knowledge, an issue which has been widely debated and discussed in the literature (see Guthrie 2009). The second issue, less commonly raised, was the extent to which competency-based training was able to develop the person. One trade teacher said that 'in our trade training we are so focused on being industry driven and giving a competency-based outcome that we forget they are people. We don't even treat them like human beings'. The focus was on workplace outcomes, not on helping them to develop themselves and their careers. More broadly, there were arguments that the competency-based curriculum in VET did not align with the higher education curriculum and this constrained pathways.

There was broad agreement that students didn't have the maths they needed in some cases to undertake the qualification they were in, but particularly to proceed to the next level. It was argued that the competency-based nature of VET qualifications meant they didn't emphasise maths enough. School leavers' capacities in maths were widely regarded as a substantial problem, whether they were entering VET (particularly but not only the trades) but also higher education.

Work placements

Discussion about the nature and role of work placements was interwoven with discussion about the relative roles and responsibilities of educational institutions and employers respectively. One higher education teacher explained that they could broadly prepare students, but employers had responsibilities to help them acquire specific skills, given 'the diversity of jobs out there'. A key issue in work placements was helping employers to understand how their workplace could support student learning, and to understand students' learning needs rather than expecting a fully developed worker. This was part of a broader issue about building relations between educational institutions and employers and realising that each had expertise that the other did not. For example, one senior university manager explained that employers have a role in developing pathways, 'but while they know what they need today, they do not know so well what they will need in the future'.

Participants supported work placements because they enable students to develop the skills and attributes they need in a job and to consolidate theoretical learning, and because there are some things they can learn only by doing. A number of teachers and managers of programs which did not include work placements thought they would be a good idea. According to a senior manager, 'vacation jobs are really, really valuable, it's a good model. Because the students get on the job training, it ensures that as employees they will have the necessary skills required'.

However, there are two main problems. First, it is very difficult to find work placements for all students. One manager is mindful that some employers are constantly called about work placements from students in Year 9 and up. The problem is particularly acute in nursing, where there is competition between VET and higher education for placements. It was reported that government funding makes it more attractive for hospitals to take the higher education nursing students.

Secondly, the quality of work placements is highly variable. Some are considered very good, others very poor. In workplaces that are already stretched, staff do not have the time to teach students and students may be required to do low-level work rather than engage in appropriate learning activities. It was reported that students witness poor work practices in some poor-quality placements, including practices that may breach staff legal responsibilities. The trade teachers explained that in the past big building sites used to have an 'apprentice master' who ensured that the apprentices engaged in appropriate activities. This has gone, and apprentices are often not given the learning experiences they need, or they may be exploited by the employer. An additional problem could be that the employer does not understand the nature of learning, and might compare the student's learning with their own and find it wanting. One teacher felt that work placements were good in theory but they don't work in practice because it is difficult to get meaningful placements, with the quality varying substantially. One interviewee referred to pressure from the health industry for jointly funded staff to supervise students while on placement. The institution did not have the funding and 'has to frankly tell employers that if they want workforce development they need to contribute'.

Given the difficulties, some institutions are considering how they can support students to gain the work-related skills they need. One manager said that there is an increasing reliance on project and problem-based learning, whereby students learn to work in a team. Some of the projects are community-based. Other options include holiday jobs and summer scholarships and employment. This may be an option for younger students, but it may be difficult for parents, particularly those already working.

Overall, while work placements and work experience were seen to be intrinsic to students' learning, there were many difficulties. Some lay with funding and resources, others with identifying

appropriate placements, and others were with helping employers to develop their workplace as a learning place, while recognising that learning needed to support and not supplant the employer's main business. This reflects the lack of systematised corporate relationships between employers, employee bodies, educational institutions and government, and the absence of institutional arrangements, whereby the respective roles are negotiated and appropriate resourcing identified so that each shares responsibility for the outcome. There is much that educational institutions can do to provide work-based learning experiences for students, but they can't do this in the absence of good relations with employers.

Discussion and conclusion

As explained, this report is part of a three-year project investigating how to improve flows within education, within work, and between education and work. It is part of Strand 2, which focuses on flows within tertiary education, but also on flows between tertiary education and jobs. This report comes at the end of the first year of the research program. It builds on our previous working paper, which included an analysis of student articulation within the four industries we are using as case studies: finance, primary industry, health and electrical trades/engineering (Moodie 2012). The working paper demonstrated differences in patterns of student movement within and between sectors in those industries. Health and the electrical trades/engineering are examples of occupationally segmented labour markets, and patterns of student articulation in related fields of education reflected the presence or absence of occupational pathways. There were high levels of student articulation within nursing from VET to higher education, but low levels within the electrical trades/engineering. Conversely, the fields of education serving the finance and primary industries reflected the occupational structures of those industries. Finance lies in the management and commerce field of education, has high levels of articulation and is characterised by more fluid patterns of employment, whereas agriculture has low levels of articulation, reflecting the absence of occupational pathways (Yu, Bretherton & Schultz 2012).

This report extends this earlier analysis by exploring in more detail patterns of movement in fields of education within VET and higher education and between VET and higher education. Using logistic regression, it shows that the extent to which students stay in or move fields of education when they undertook two qualifications differed depending on the field of education. Those with well-defined occupational pathways tended to stay in their field of education when undertaking their second qualification, while those in weakly defined occupational pathways tended to move fields of education when undertaking their second qualification. An exception is a field of education like management and commerce, which has high levels of articulation because upper-level VET and higher education qualifications are preparing students for similar jobs in the same fields, and VET students may need to acquire higher education qualifications to compete with degree graduates.

The report also undertook a descriptive analysis, which examined students' reports of the impact that acquiring their first qualification had on their working life, their reasons for undertaking their first qualification, and their reasons for undertaking a second qualification. While there were some differences between VET and higher education students, there wasn't a great deal of difference between fields of education.

Educational pathways differ because, broadly speaking, they reflect fields of education characterised by an employment logic and those characterised by an educational logic. In the case of the former, there are tighter links between education and the workplace, with education embedded in work to a greater extent than fields of education characterised by an educational logic, where the relationship between education and jobs is weaker. For example, the relationships between education and jobs in nursing and engineering are both characterised by an employment logic, whereas finance and agriculture are characterised by an educational logic. However, because all exist within a dominant liberal market economy, all have variable relationships between education and jobs, which are, to a greater or lesser extent, moderated by markets rather than corporatist relations. The systemic link between education and jobs is based on an education logic, which shapes perceptions of VET as low status and contributes to the fragmentation of educational and labour market pathways.

However, this is only part of the story. It is necessary to understand how the structures of education and work and institutional and workplace realities mediate different types of pathways, and how these intersect with the reality of student lives. One of the strengths of transitional labour market theory, which explores key transition points in individuals' lives and work, is that it starts with the assumption that individuals will move between education and periods in and out of paid employment. The qualitative analysis presented here shows that the way educational and occupational pathways are conceptualised must start with a realistic and inclusive idea of the person. Both the quantitative and qualitative analyses show the need to go beyond a narrowly defined notion of jobs and preparation for work as preparation for specific jobs. While getting a job is the key driver, this is linked to personal development, aspirations, values and goals. NCVER data provide additional evidence: about 80% of VET graduates in 2011 said getting a job was the main reason they studied, 15% said that they studied for personal development, and only 4% said that they studied so they could go on to further study. However, 32% of VET graduates went on to enrol in further study (NCVER 2011b, table 1).

Transitional labour market theory is also helpful because it calls attention to the complexity of individuals' lives. While increasing numbers of individuals in the workforce are gaining more than one qualification, the path to gaining qualifications and moving to further qualifications can be difficult. Gallacher and his colleagues (2012) found in a study in England and Scotland that a very high number of students planned to articulate to degrees from lower-level qualifications, and while the numbers who did so remained high, many completed their first qualification but did not carry out their initial intention to proceed to a higher qualification. Even more strikingly, NCVER (2011a) found that the vast majority of VET students intend to complete their program and graduate, but it has found in other studies that most students do not complete their VET qualification (NCVER 2011c). Clearly there is a gap between students' goals, intentions and outcomes.

The interviews provide insight into the factors that mediate students' transitions between qualifications and sectors, and between education and work. Much existing research focuses on problems within education: policies, funding and governance at the sectoral level and relations between institutions in VET and higher education. This research is important and this report also identifies similar issues; however, it goes beyond these to consider how the reality of students' lives is mediated by existing institutional frameworks and processes, and also how these intersect with the structure of the labour market and with the realities of work.

There is much here that requires further research. The analysis in this report suggests that there is value in investigating whether flows within education, within work, and between the two may be improved by using the notions of vocations, vocational streams and capabilities. A vocation emerges from fields of practice where there are commonalities in the nature of practice, and the knowledge, skills and attributes required to work in that field. Vocational streams are not tightly defined by individual jobs, but consist of linked occupations within broad fields of practice, and in turn, each occupation leads to a number of jobs. Individuals need capabilities that allow them to move vertically and horizontally within vocational streams, rather than the knowledge and skills for a specific job. This is depicted in figure 3. Such an approach could provide the basis for policy that differentiates between skills ecosystems and the patterns of skill development.

Education also needs to develop students' capabilities so they can undertake occupations they value, and to help them to realise their aspirations and personal objectives. Capabilities are underpinned by individual, economic, social, cultural and environmental resources. They result in knowledge, skills, attributes and resources that allow individuals to live their lives, exercise choice, and to exercise

autonomy, judgment and creativity at work. Capabilities underpin the knowledge, skills and attributes that individuals need to work within specific vocations. These will be different, depending on the vocation. While there will be some overlaps, someone who chooses to work in care work will require different capabilities from those who work in agriculture, the finance industry or the electrical trades/engineering industry. Capabilities are differentiated from generic skills, employability skills or graduate attributes because they are not 'general' or 'generic'. Rather, the focus is on the development of the individual and on work, and consequently students need access to the knowledge, skills and capabilities so they can exercise agency in their vocational stream (Winch 2010). The model of capabilities we are using is based on the work of Nobel Laureate economist Amartya Sen (1999) and the philosopher Martha Nussbaum (2000).

Figure 3   Relationship between capabilities, vocations and vocational streams
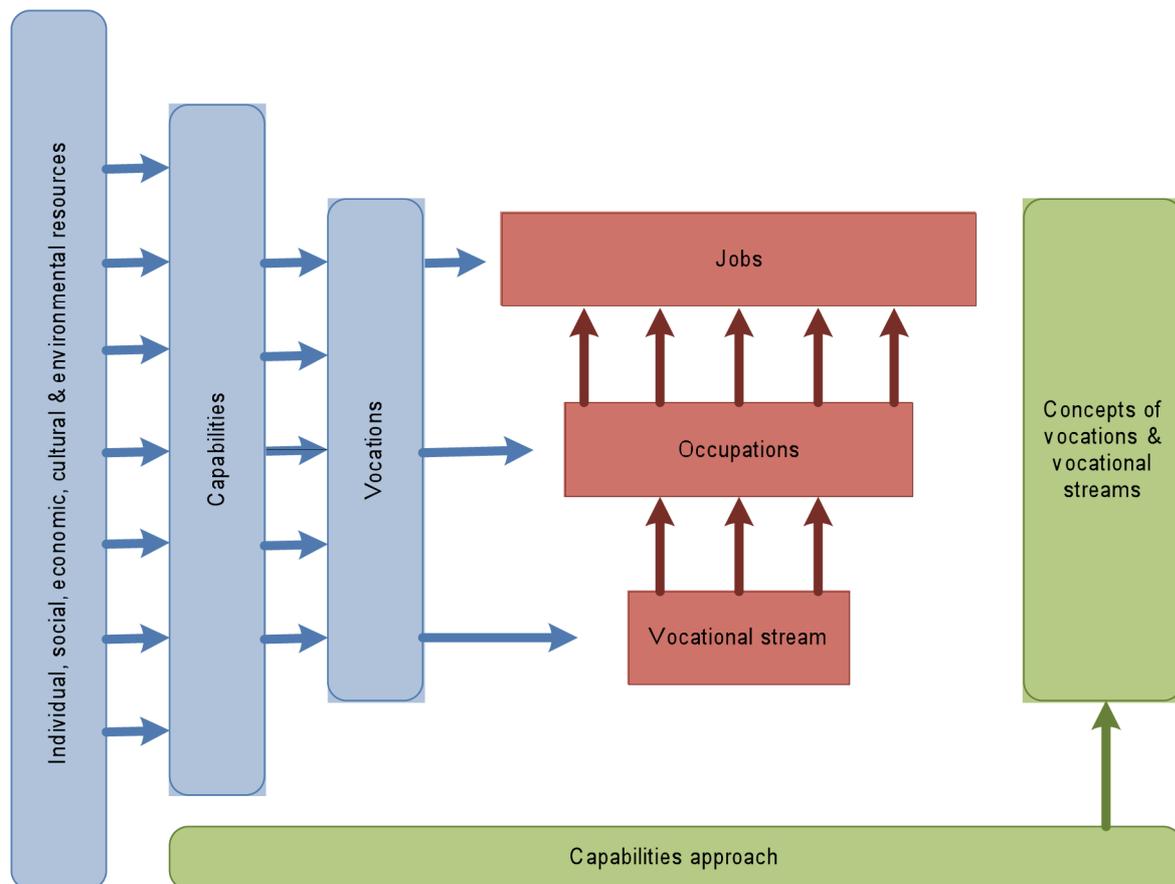
The idea of vocational streams may help students to navigate through a sometimes bewildering range of potential options. Making decisions about future study and employment may be much easier if students could initially focus on their preferred vocational stream knowing that they can specialise in ways that will enable them to progress vertically and/or horizontally. Focusing on a vocational stream encourages students to choose the subjects and programs that will maximise their options within that stream. The emphasis for school leavers could shift from 'failing to get the score for a particular course' to identifying options and pathways in the vocational stream.

The potential for vocations, vocational streams and the capabilities approach will be explored in the second year of the project. This will include examining the nature of existing qualifications and their relationship to the workforce and pressures for change.

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Appendix A: Methods

This section outlines the methods used in Strand 2 of the vocations project.

This research project was shaped by six key questions which were designed to identify and provide insights into the factors that support or inhibit student progression to higher-level qualifications within four broad fields of education. Based on the gaps in knowledge and the social and economic needs identified in the literature (as discussed in Wheelahan, Moodie & Buchanan 2012), the following six key research questions were formulated.

1   To what extent does Australia have a concept of higher vocational education and what is its relationship to intermediate levels of skill in mediating educational and occupational progression?

2   What are the patterns of student movement between qualification levels and fields of education?

3   What are students' experiences of transition between qualifications and between sectors, and graduates' experiences of transition to work?

4   What are teachers' experiences and views about how they can support students' transitions and the knowledge, skills and attributes they need to do this?

5   What are the views of senior managers, learning support advisors and those who broker pathways and arrangements between institutions and sectors about how to support student transitions?

6   What is the impact of existing policies, institutional structures and curriculum models on students' transitions?

The study has a mixed methods design, consisting of the quantitative analysis of student flows between and within sectors and broad fields of education and the qualitative analysis of interviews with relevant participants. The 'triangulation' of the findings of both quantitative and qualitative methods is particularly useful when examining different dimensions of a complex social phenomenon (Bryman 2004, pp.451—65). This combination of different methods, each appropriate for answering specific research questions, can be particularly helpful in drawing out broad explanatory mechanisms and developing theory; that is, 'a nexus of mutually supportive explained propositions can be constructed in which the whole stands distinct from its parts' (Downward & Mearman 2007, p.93). The aim in this project was to draw out the factors structuring tertiary student progression evident from both the overall quantitative pattern and from the concepts, views and experiences that emerged from interviews.

In the quantitative aspect of the study, and in particular in addressing the second of our six research questions, we sought a data source that would tell us about the fields and sectors of successive tertiary study. The possible sources of quantitative data include the census, institutional data from both higher education and VET, tertiary admission centres data, several ABS surveys and other surveys such as the Household, Income and Labour Dynamics in Australia (HILDA) Survey and the Longitudinal Surveys of Australian Youth (LSAY). An appendix to the project's Strand 2 working paper outlines the problems and limitations of the different possible data sources on student transfers (Moodie 2012). Institutional data from VET and higher education were found to be incompatible in a number of areas and inconsistently recorded between institutions. Most data sources record respondents' field of education only for the current study they may be undertaking. But to examine patterns of movement between fields it is necessary to examine the field of any previous study. This is provided only by the LSAY and the ABS Survey of Education and Training. The LSAY had the advantage of following cohorts

through time but only up to the age of 24, which is too limited for our study. The Survey of Education and Training, while cross-sectional, represents all those aged 15—74. It also records details of all current and past qualifications. Furthermore, uniquely for a regular large-scale survey in Australia, it contains very relevant questions about the labour market impact of a respondent's first qualification and their stated reasons for undertaking each qualification (labour market-related, educational and otherwise). Hence the survey for 2009 (it is undertaken very five years) was selected as the main source of data for the quantitative part of the second strand of the project.

The project is, to a considerable extent, exploratory. The statistical findings presented are mainly descriptive, investigating the proportion of students who had undertaken further tertiary study. For students who have undertaken further studies, we examined the proportion who changed sectors and fields. We also considered how impacts of and reasons for study varied with sector and field. Factors contributing to field-changing between successive tertiary programs are also examined analytically via logistic regression. The results are weighted by the appropriate variable given in the ABS file to ensure that the sample represents the population in: sex, age, state or territory of usual residence, section of state or territory and labour force status. In calculating the variance of estimates, the complex sampling design is taken into account by using the replicate weights provided in the ABS file, using the jack knife technique (for background and explanation of sampling and weightings see ABS 2010). All analyses were implemented with the SAS package.

A multiple case study design (Hall 2008, p.110) was used to structure the qualitative aspect of the study. A total of 72 participants were interviewed, selected by their affiliation with the four institutions selected as case studies. Students, graduates and teachers were chosen for their association with the four broad fields of education selected as case studies. We also consulted four UK researchers. This sample size is designed to collect a range of perspectives both within and between the case study fields of education and the institutions. We used purposeful sampling (Creswell 2008, p.214) in selecting institutional sites and fields of education and also in selecting interviewees within sites. The purpose of the sample was to provide contrastive examples (Creswell 2008, p.477), with selections made by the researchers' extensive knowledge of the sector. This sampling design aimed to provide insights into the range of practices and experiences at different institutions and in different fields of education. The method is qualitative in nature, and the sample is not intended to be statistically representative of a particular population. This contrasts with the quantitative part of the study, which uses a survey sample representative of the whole population to answer more specific questions as well as to complement the broader insights provided by the interview data.

An important part of the overall research design for all three strands of the vocations project was to report initial findings and analyses made during 2011 to two seminars held in August and December of that year. Both seminars were attended by a cross-section of researchers, practitioners and policy-makers. The rich discussion at these two events informed our developing interpretations and conceptual frameworks.

All three strands of the projects are studying educational and occupational pathways in four broad industries: primary industry, health care, finance and accounting, and electrical work and engineering. These were selected to provide contrasting examples and a range of insights into the nature of education and work across the whole economy. This follows from initial work using these industries as examples presented by Buchanan, Yu et al. (2010). The related four broad fields of education selected as case studies for Strand 2 thus were: agriculture and environment; health; commerce and management; and engineering and related technologies.

The six institutions selected as contrastive multiple case studies consisted of one dual-sector university, two non-dual-sector universities, one TAFE institute that offers higher education programs and two TAFE institutes that do not. VET and higher education programs in health, and the relationships between them, were examined through interviews at the dual-sector university. Agricultural programs in VET and higher education were examined through interviews at a TAFE institute and a university in the same state. Engineering programs in VET and higher education were examined through interviews at a TAFE institute and a university in the same state, and some VET engineering students were also interviewed at the dual-sector university. VET and higher education accounting programs were examined at the TAFE institute that offered baccalaureates. These varied institutions were selected to, again, provide contrasting examples.

The interview instruments used with the participants were designed to elicit a nuanced and deep understanding of the provision and perspectives of VET, higher education and work and pathways between them from a range of interest groups, based on our review of the literature. Six interview schedules were developed for this project for different types of participants. These were: teachers, learning advisors, pathways officers, managers, students and graduates. The interview schedules were the bases for semi-structured interviews, a form used to ensure consistency in the interviews and thus allow comparison across sites and categories of interviewees, while at the same time allowing the interviewee the ability to develop their ideas and address issues they considered important (Hillier & Jameson 2003, p.103).

Each participant took part in an interview lasting approximately 30 minutes for students and graduates and one hour for staff members and international researchers. These were mainly conducted face to face at each site, although in four cases interviews were conducted by telephone. Most interviews were conducted singly. However, two teachers from one institution were interviewed together. Another interview was conducted with four students from one program. These students were offered the option of individual interviews.

A total of 31 students were interviewed, consisting of 22 studying a VET program and nine studying a higher education program. Five of the students were studying a VET program at a single-sector TAFE, four were studying a degree program at a single-sector university, seven were studying either a VET or higher education program at a mixed-sector TAFE and 15 were studying either a VET or higher education program at a dual-sector university. The sample included students from at least two different levels of VET programs and a degree program in each of the four broad fields of education examined. There were five graduates of VET programs and two graduates of higher education programs interviewed. Two graduates had completed a certificate III, one had completed a certificate IV and a diploma, one had completed a diploma and an advanced diploma, and three had completed degrees. We were not able to interview graduates of VET engineering programs or those of either VET or higher education programs in accounting. In the next section we discuss issues in the recruitment of graduates and students. Of the 17 teaching staff interviewed, ten taught only in VET, four taught only in higher education and three taught in both sectors. The 13 non-teaching staff interviewed included three university managers, four TAFE managers, two dual-sector university managers, a pathways officer from each of a dual-sector university and a university and a learning adviser from each of a TAFE and a dual-sector university. Appendix B provides a more detailed profile of each category of interviewee.

An interpretative approach was used to analyse the interviews as the aim was to represent and understand meanings of participants (Hall 2008, p.258). All interviews were written up using a pre-prepared template for consistency and ease of analysis and analysed with the aid of NVivo software (Hall 2008, p.266). All interviews were read through several times before being ordered in a case-

ordered matrix (Hall 2008, p.266). Themes were analysed and grouped into major and minor themes (Creswell 2008, pp.258—9).

Ethical clearance for the project and its interview protocols was obtained from the Melbourne Graduate School of Education at the University of Melbourne (Ref. No: Melbourne Graduate School of Education HREC: 1135292.1). We sought permission from each institution to conduct the research and worked with a person nominated by the institution to identify potential interviewees according to criteria we supplied. Interviewees were contacted in each institution by that institution and they were asked if they were willing to participate. Interviewees were provided with information about the project and they were advised that they could withdraw at any time and that there would be no consequences if they did so. All participants were guaranteed anonymity and we had guaranteed institutional leaders that their institutions would not be able to be identified, even indirectly, without their permission.

Limitations

There were a number of limitations with the quantitative aspect of the study. In the absence of institutional student population data giving details of past and present study, including fields of education, we relied upon a sample survey, which for the less popular fields included low sample numbers and hence produced estimates with large variabilities. To keep the extent of the results within reasonable bounds we also excluded uncompleted qualifications, and only examined first and second qualifications. Most qualifications are thus included; however, as reported in the third chapter, in 2009 an estimated 9% of the population in 2009 have three or more post-school qualifications. We were also quite limited in what we could show about change over time, as the 2009 Survey of Education and Training was the first of the series to record multiple qualifications in order of their acquisition. Since previous surveys in the series recorded qualifications only in order of the level of qualification we couldn't compare patterns of successive qualification pathways between surveys. Some tentative conclusions were made about change over time, based on differences between broad age groups and known changes in patterns of education for particular fields, although another limitation is that for simplicity we did not use the data available on how long before the survey qualifications were completed. This could be investigated further, although this would entail smaller sub-samples and larger variability. It might also be fruitful to examine the factors associated with travelling on differing educational pathways by multinomial logistic regression.

The most notable limitation of the interview data is the relative lack of graduate perspectives, due to difficulties in recruitment. In most cases our contact or a teacher forwarded an invitation to participate in the study using the most recent contact details. However, there was a low response rate. We had planned to interview a graduate of each of a degree program and a higher- and a lower-level VET program in each of our four fields, for a total of 12 interviews. Institutions involved in the study were not able to recruit graduates of VET engineering programs or those of either VET or higher education programs in accounting, and we interviewed seven graduates altogether. This seems a particularly different category of interviewee to recruit, and other strategies for obtaining graduate perspectives may have to be explored for future projects.

Students were somewhat easier to recruit as participants, as they had direct contact with the teachers assigned by participating institutions to help us recruit students. Partly to balance the relative lack of graduates, we interviewed somewhat more students than originally planned, with 31 interviews conducted. As noted, the sample included students from at least two different levels of VET programs and a degree program in each of the four broad fields of education examined. Most

students were also undertaking their second qualification and so were able to speak about their experiences of transition. However, there were a number of difficulties in accessing students. Teachers stated that many students do not physically attend lectures but listen online, and this made it difficult in some cases to recruit students. In the upper-level VET agriculture programs, all learning was self-directed with occasional meetings with the teacher rather than attendance at classes. The sample of students may therefore be skewed towards the most highly motivated and such issues need to be taken into account in future studies seeking to examine the views of a range of students.

Appendix B: Profile of interviewees

Table B1 Non-teaching staff interviews

Staff type	No. interviewed
University manager	3
TAFE manager	4
Dual-sector university manager	2
University pathways officer	1
Dual-sector university pathways officer	1
Dual-sector university learning advisor	1
TAFE learning advisor	1
Total	**13**

Table B2 Profile of teachers

Attribute	No. interviewed
Female	6
Male	11
Programs they teach in	
HE only	4
VET only	10
Both HE and VET	3
Field of education	
Agriculture	3
Commerce and management	4
Engineering	6
Health	4
Total	**17**

Table B3 Profile of students

Attribute	No. interviewed
Sex	
Female	13
Male	18
Age range	
Under 25	15
25–29	8
30–34	2
35–39	1
40 and over	5
Institution type[1]	
Single-sector TAFE	5
Dual-sector TAFE	7
Single-sector university	4
Dual-sector university	15
Sector	
HE	9
VET	22
Level of program enrolled in	
Degree	11
Associate degree or diploma	9
Certificate III or IV	11
Field of education	
Agriculture	5
Commerce and management	7
Engineering	8
Health	11
Total	**31**

Table B4 Profile of graduates

Attribute	No. interviewed
Sex	
Female	5
Male	2
Age range	
Under 25	1
25–29	1
30–34	1
35–39	1
40 and over	3
Institution type	
University	2
TAFE	2
Dual-sector university	3
Sector graduated from	
HE	3
VET	4
Level of program graduated from	
Degree	3
Diploma and advanced diploma	1
Certificate IV and diploma	1
Certificate III	2
Field of education	
Agriculture	3
Commerce and management	0
Engineering	1
Health	3
Total	**7**

Other interviewees

International experts: 4

Total number of interviewees: **72**

Appendix C: Additional tables

Table C1 Numbers who have commenced in each field of education and proportions of these who by age group have gone to a second qualification

First qualification field	First qual. sector	Age group	Total no.	Subsequent qualification, %				
				None	VET	HE	Not det.	Total
Natural and physical sciences	VET	15–39	15 000	20.0	42.6	28.7	8.7	100.0
		40–64	29 000	30.6	44.7	24.4	0.2	100.0
	HE	15–39	172 000	42.0	8.2	49.8	0.1	100.0
		40–64	148 000	28.7	10.4	57.5	3.4	100.0
Information technology	VET	15–39	120 000	46.6	35.5	14.1	3.8	100.0
		40–64	51 000	54.3	36.7	4.8	4.2	100.0
	HE	15–39	94 000	53.5	9.7	34.0	2.8	100.0
		40–64	27 000	67.3	10.8	21.3	0.6	100.0
Engineering	VET	15–39	588 000	73.0	20.8	3.6	2.6	100.0
		40–64	828 000	61.9	29.3	5.1	3.7	100.0
	HE	15–39	138 000	69.8	6.8	21.0	2.4	100.0
		40–64	112 000	48.8	13.9	36.9	0.4	100.0
Architecture and building	VET	15–39	224 000	77.9	15.4	3.7	3.7	100.0
		40–64	237 000	72.0	21.3	4.0	2.8	100.0
	HE	15–39	32 000	65.0	8.6	22.6	3.8	100.0
		40–64	17 000	45.0	16.9	38.1	0.0	100.0
Agriculture and environment	VET	15–39	101 000	61.0	29.9	7.6	1.5	100.0
		40–64	89 000	63.5	29.5	4.3	2.7	100.0
	HE	15–39	42 000	47.3	12.7	36.9	3.2	100.0
		40–64	24 000	38.2	5.0	50.2	6.6	100.0
Health	VET	15–39	114 000	51.2	22.1	16.5	10.3	100.0
		40–64	256 000	46.2	20.8	29.5	3.5	100.0
	HE	15–39	235 000	59.8	5.1	32.0	3.1	100.0
		40–64	179 000	47.6	10.4	37.2	4.7	100.0
Education	VET	15–39	37 000	52.6	21.0	22.2	4.2	100.0
		40–64	176 000	37.6	15.2	46.1	1.1	100.0
	HE	15–39	154 000	66.8	7.8	24.1	1.2	100.0
		40–64	157 000	40.8	11.6	46.1	1.4	100.0
Management and commerce	VET	15–39	804 000	56.0	28.9	12.9	2.1	100.0
		40–64	707 000	63.9	27.5	5.8	2.8	100.0
	HE	15–39	413 000	57.2	8.4	32.4	2.1	100.0
		40–64	174 000	49.0	10.0	39.7	1.3	100.0
Society and culture	VET	15–39	342 000	51.4	32.6	12.3	3.7	100.0
		40–64	245 000	58.4	30.4	7.5	3.8	100.0
	HE	15–39	381 000	49.0	9.5	38.3	3.2	100.0
		40–64	276 000	27.9	9.2	59.6	3.3	100.0

First qualification field	First qual. sector	Age group	Total no.	Subsequent qualification, %				
				None	VET	HE	Not det.	Total
Creative arts	VET	15–39	165 000	53.3	25.6	17.1	4.1	100.0
		40–64	95 000	56.6	26.7	15.3	1.5	100.0
	HE	15–39	145 000	59.2	11.3	27.0	2.5	100.0
		40–64	50 000	35.7	24.7	37.2	2.4	100.0
Food and hospitality	VET	15–39	396 000	61.8	29.5	7.6	1.1	100.0
		40–64	213 000	68.8	25.1	3.2	2.9	100.0
	HE	15–39	5127	67.9	10.4	21.7	0.0	100.0
		40–64	1422	5.9	94.2	0.0	0.0	100.0

Source: ABS Survey of Education and Training, 2009.

Table C2 Those citing each impact of first qualification on working life in first 6 months after completion (single choice), by pathway and whether field had changed or not (%)

Impact	VET only	VET to VET	VET to HE	HE only	HE to VET	HE to HE	Total*
Not applicable	19.1	2.9	2.5	32.7	0.1	1.1	14.1
Same field	NA	3.9	1.3	NA	0.1	1.2	2.5
Changed field	NA	1.9	3.8	NA	0.0	1.0	1.6
Assisted respondent to perform same job to a higher standard or undertake additional duties	26.9	27.6	20.1	7.6	10.8	7.2	20.0
Same field	NA	28.4	20.8	NA	13.0	7.2	19.2
Changed field	NA	26.9	19.4	NA	9.9	7.1	17.9
Assisted respondent to get a different job or promotion in the same field	5.7	8.4	7.0	3.5	2.9	3.6	5.7
Same field	NA	8.7	7.9	NA	2.6	5.2	7.1
Changed field	NA	8.1	5.9	NA	3.0	1.9	5.8
Assisted respondent to begin a new career (i.e. get a different job in a different field)	20.7	24.2	33.0	36.3	50.3	46.3	28.9
Same field	NA	23.7	34.1	NA	50.3	46.5	33.9
Changed field	NA	24.7	31.7	NA	50.4	46.1	34.3
Assisted respondent to find a job	2.7	3.4	1.8	2.1	2.9	2.5	2.7
Same field	NA	3.4	1.0	NA	4.7	2.4	2.6
Changed field	NA	3.3	2.7	NA	2.1	2.6	3.1
Assisted respondent to start or expand own business	2.0	2.2	0.5	0.9	1.4	0.8	1.6
Same field	NA	1.7	0.0	NA	0	0.6	1.3
Changed field	NA	2.8	1.0	NA	2.0	0.9	1.9
Qualification had other impact on working life	3.3	4.1	4.2	1.8	4.5	4.4	3.5
Same field	NA	4.4	3.6	NA	2.8	4.5	4.2
Changed field	NA	3.9	5.0	NA	5.2	4.2	4.4
Qualification had no impact on working life including permanently unable or not intending to work	19.7	27.2	30.9	15.1	27.1	34.2	23.6
Same field	NA	25.9	31.2	NA	26.4	32.4	29.2
Changed field	NA	28.4	30.5	NA	27.4	36.2	31.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Same field	NA	100.0	100.0	NA	100.0	100.0	100.0
Changed field	NA	100.0	100.0	NA	100.0	100.0	100.0

Notes: * Includes those in pathway 'not determined' category not otherwise shown.

Source: ABS Survey of Education and Training, 2009.

Table C3 Percentage citing each reason for undertaking their first qualification (multiple choices), by pathway and whether field had changed or not between qualifications

	VET only	VET to VET	VET to HE	HE only	HE to VET	HE to HE	Total*
To get into another course of study	4.1	6.6	13.0	4.8	6.3	8.7	5.9
Same field	NA	7.8	14.0	NA	2.0	9.6	9.6
Changed field	NA	5.3	12.0	NA	8.1	7.8	6.8
To get a job	54.1	45.8	53.1	74.6	69.5	66.4	57.4
Same field	NA	43.2	55.6	NA	70.1	67.6	54.1
Changed field	NA	48.2	50.3	NA	69.2	65.0	55.9
To get a different job or promotion	10.0	9.9	10.1	7.5	6.7	6.5	9.0
Same field	NA	11.1	9.4	NA	7.8	6.8	9.3
Changed field	NA	8.8	10.9	NA	6.2	6.1	8.0
Was a requirement of job	20.2	22.4	15.1	7.3	7.1	7.0	16.1
Same field	NA	22.5	14.1	NA	5.5	6.6	15.2
Changed field	NA	22.3	16.3	NA	7.8	7.6	15.3
Wanted extra skills for job	20.3	19.5	13.2	9.3	9.1	7.9	15.8
Same field	NA	21.9	13.5	NA	11.2	7.4	15.1
Changed field	NA	17.2	12.9	NA	8.2	8.5	13.3
To start own business	6.4	5.3	1.9	7.1	4.9	1.5	5.3
Same field	NA	4.8	1.3	NA	3.9	2.3	3.6
Changed field	NA	5.9	2.5	NA	5.2	0.7	3.9
To develop existing business	1.5	1.2	0.6	0.2	0.3	0.7	1.1
Same field	NA	1.2	0.4	NA	0.4	0.9	1.0
Changed field	NA	1.1	0.8	NA	0.3	0.5	1.0
To try for a different career	9.1	9.0	8.7	9.1	6.4	5.4	8.6
Same field	NA	8.1	8.1	NA	2.8	4.2	6.6
Changed field	NA	9.9	9.4	NA	7.8	6.6	9.0
To improve general educational skills	18.6	21.9	23.7	32.1	33.6	34.4	24.2
Same field	NA	23.6	20.1	NA	39.1	33.4	26.6
Changed field	NA	20.3	27.6	NA	31.3	35.4	26.6
To get skills for community/voluntary work	2.3	2.8	1.7	5.3	3.9	2.2	3.0
Same field	NA	2.5	2.0	NA	4.9	1.9	2.5
Changed field	NA	3.0	1.3	NA	3.5	2.5	2.9
To increase confidence/self-esteem	7.5	7.2	6.5	11.4	7.5	7.3	8.0
Same field	NA	6.9	6.1	NA	5.2	8.2	7.3
Changed field	NA	7.5	7.0	NA	8.5	6.5	7.3
For personal interest/enjoyment	21.8	23.1	24.4	37.7	31.8	33.7	26.7
Same field	NA	21.9	24.5	NA	25.4	30.1	25.6
Changed field	NA	24.3	24.2	NA	34.4	37.5	29.2

Notes: * Includes those in pathway 'not determined' category not otherwise shown.
Source: ABS Survey of Education and Training, 2009.

Table C4 Percentage citing each reason for undertaking their second qualification (multiple choices), by pathway and whether field had changed or not between qualifications

	VET to VET	VET to HE	HE to VET	HE to HE	Total
To get into another course of study	6.9	7.7	5.3	6.1	6.6
Same field	7.8	5.2	3.4	6.6	6.6
Changed field	6.2	10.4	6.0	5.5	6.5
To get a job	23.5	34.4	22.5	38.6	29.0
Same field	23.8	29.8	26.4	33.7	27.4
Changed field	23.1	39.5	21.0	43.6	30.4
To get a different job or promotion	20.9	24.5	22.2	23.8	22.3
Same field	19.8	25.7	21.3	23.0	21.9
Changed field	22.0	23.1	22.5	24.7	22.6
Was a requirement of job	22.3	9.5	21.3	14.1	17.7
Same field	21.6	10.3	19.8	15.9	18.0
Changed field	22.9	8.7	21.9	12.2	17.5
Wanted extra skills for job	34.4	30.3	31.0	30.8	32.6
Same field	38.0	36.0	37.7	34.4	36.9
Changed field	30.9	24.1	28.3	27.1	28.7
To start own business	8.8	4.7	7.2	3.5	6.4
Same field	8.6	4.1	6.3	3.3	6.2
Changed field	9.0	5.4	7.5	3.6	6.7
To develop existing business	2.6	1.5	4.0	2.2	2.6
Same field	2.7	1.4	2.2	2.6	2.7
Changed field	2.5	1.7	4.8	1.9	2.6
To try for a different career	16.2	21.4	18.4	14.9	16.7
30% nominate Same field	12.2	11.2	14.8	9.5	11.3
Changed field	20.0	32.7	19.9	20.5	21.6
To improve general educational skills	26.3	34.9	22.7	34.6	29.7
Same field	27.2	33.2	30.5	37.9	31.8
Changed field	25.5	36.7	19.5	31.1	27.7
To get skills for community/voluntary work	4.2	3.6	4.9	3.2	3.8
Same field	2.8	3.1	2.9	2.3	2.6
Changed field	5.5	4.2	5.7	4.1	4.8
To increase confidence/self-esteem	9.5	12.0	9.1	10.1	9.9
Same field	8.8	10.4	7.1	11.3	9.7
Changed field	10.2	13.8	9.9	8.9	10.1
For personal interest/enjoyment	24.0	36.5	26.3	31.8	28.7
Same field	20.7	32.5	21.4	31.0	26.7
Changed field	27.3	40.9	28.3	32.7	30.5

Source: ABS Survey of Education and Training, 2009.

Table C5 Odds ratios for significant items in regression models for staying in the same field between two qualifications, run for all and separately for each pathway

	VET to VET	VET to HE	HE to VET	HE to HE	All pathways
Age 25 and over	1.5				1.3
1st qualification reason: to get into another course					0.6
2nd qualification reason: to get a job		1.7		1.6	
2nd qualification reason: job requirement				0.7	
2nd qualification reason: extra skills for job	0.7				0.7
2nd qualification reason: different career	1.6	3.0		2.5	2.0
2nd qualification reason: general educational skills					0.7
2nd qualification reason: community/volunteer skills					1.7
2nd qualification reason: increase confidence/self-esteem				0.6	
2nd qualification reason: general interest/enjoyment	1.5			1.4	1.2
1st qualification physical sciences vs 1st qualification management and commerce	3.3			25.9	5.3
1st qualification information technology vs 1st qualification management and commerce				4.2	2.9
1st qualification engineering vs 1st qualification management and commerce	2.7	10.8	6.8	9.3	3.8
1st qualification architecture and building vs 1st qualification management and commerce	2.1				2.2
1st qualification agriculture and environment vs 1st qualification management and commerce	2.4			17.0	3.4
1st qualification health vs 1st qualification management and commerce	1.7	0.3	12.5		
1st qualification: education vs 1st qualification management and commerce	2.7	0.2	21.5		
1st qualification society and culture vs 1st qualification management and commerce			8.7	7.4	1.6
1st qualification creative arts vs 1st qualification management and commerce			19.3	22.3	2.8
1st qualification food and hospitality vs 1st qualification management and commerce	5.0				6.6
2nd qualification field natural and physical sciences vs 2nd qualification management and commerce				0.1	0.4
Second qualification field is engineering vs 2nd qualification management and commerce	0.2	0.1		0.2	0.2
Second qualification field is architecture and building vs 2nd qualification management and commerce					0.6
Second qualification field is agriculture and environment vs 2nd qualification management and commerce				0.1	
Second qualification field is health vs 2nd qualification management and commerce	1.8	3.7	0.1		0.6
Second qualification field is education vs 2nd qualification management and commerce	5.5	9.0			2.0
Second qualification field is society and culture vs 2nd qualification management and commerce	1.6	20.0	0.1	0.2	
Second qualification field is creative arts vs 2nd qualification management and commerce		5.3			

Notes: All the regressions were significant overall with $p < 0.001$. The models seemed relatively good fits, with concordant percentages ranging from 73% for the overall model to 84% for the VET to HE model, and Somers' D and Gamma scores ranging from 0.5 for the overall model to 0.7 for the VET to HE model.

It was initially considered that the results would be simplest to interpret with dichotomous variables for each of first and second qualification fields. However, a check for collinearity with a linear regression (with age as an arbitrary dependent) showed tolerance for many of these field variables being less than 0.3, indicating a linear relationship and hence unsuitability for logistic regression. Hence categorical variables for fields were used with management and commerce taken as the reference category, this being the field with the lowest level of field changing associated with it.

Support document details

Additional information relating to this research is available in the following support documents. They can be accessed from NCVER's website <http://www.ncver.edu.au/publications/2554.html>.

- *Tertiary student transitions: sectors, fields, impact of and reasons for study — support document*

- *Vocation project interview questions — support document.*

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