NATIONAL VOCATIONAL EDUCATION
AND TRAINING RESEARCH PROGRAM

**DISCUSSION PAPER**

# Revitalising the 'vocational' in flows of learning and labour

*Leesa Wheelahan*

LH MARTIN INSTITUTE FOR HIGHER
EDUCATION LEADERSHIP AND MANAGEMENT,
UNIVERSITY OF MELBOURNE

*Gavin Moodie*

RMIT UNIVERSITY

*John Buchanan*

WORKPLACE RESEARCH CENTRE,
UNIVERSITY OF SYDNEY

NCVER

Australian Government
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Level 11, 33 King William Street, Adelaide SA 5000
PO Box 8288 Station Arcade, Adelaide SA 5000, Australia

**P** +61 8 8230 8400 **F** +61 8 8212 3436 **E** ncver@ncver.edu.au **W** <http://www.ncver.edu.au>

# About the research

## *Revitalising the 'vocational' in flows of learning and labour*

Leesa Wheelahan, LH Martin Institute for Higher Education Leadership and Management; Gavin Moodie, RMIT; John Buchanan, Workplace Research Centre

This discussion paper introduces a three-year research program, 'Vocations: the link between post-compulsory education and the labour market', which is investigating both the educational and occupational paths that people take and how their study relates to their work. The program also explores the notion that a new conceptualisation of 'vocation' would be useful in improving the way the links between education and the labour market operate. The researchers hope that the research program will produce an operational definition of 'vocation' and 'vocational stream'. They have in mind an amalgam of the alternative dictionary definitions of vocation as: a mission to engage in a line of work; and a synonym for an occupation. Thus a vocational stream in, say, health would encompass occupations from aged care, to nursing, to medical specialities.

The research program comprises three different strands: entry to the labour market from school; pathways within tertiary education and within the labour force; and the nature of vocations in the labour market.

This paper outlines the key findings from the initial investigations of each of the research strands covering:

- *Transition systems and deepening capability*: the impact of the economy and social institutions on education; skills ecosystems; transition systems with an employment or educational logic; capability; and rethinking overseas vocational qualifications.
- *Dilemmas*: Year 12 is no longer enough; rethinking VET in Schools; is any job better than none?; the loose fit between work and qualifications; intermediate skills; pathways within tertiary education; and how vocational pathways can be constructed within vocational streams.

The paper ends with a number of issues to be investigated in the subsequent stages of the project:

- strengthening VET in Schools
- strengthening the development of intermediate skills in order to meet the requirements for higher-skilled workers
- developing the notion of capability to link education and general personal development with employment and broader social participation
- examining the structures and processes that build trust between educational institutions and sectors, between employers and labour sectors, and between education and work.

Tom Karmel
Managing Director, NCVER

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Dr Nick Fredman from the LH Martin Institute for Higher Education Leadership and Management undertook the statistical analysis on educational pathways using Australian Bureau of Statistics unpublished data.

This paper has benefited from extensive input from Mary Leahy and Nick Fredman from the LH Martin Institute for Higher Education Leadership and Management at the University of Melbourne. Kira Clarke from the Education and Policy Leadership Unit at the Melbourne Graduate School of Education, University of Melbourne, and Serena Yu from the Workplace Research Centre at the University of Sydney also had input into this report.

Much of the discussion on VET in Schools is the outcome of collaborative work between the Education and Policy Leadership Unit at the University of Melbourne and the authors. The entire research team met to consider the report and its findings, and it has been substantially modified as a consequence. The team consists of researchers from the LH Martin Institute for Higher Education Leadership and Management, the Centre for Study of Higher Education and the Education and Policy Leadership Unit at the Melbourne Graduate School of Education, University of Melbourne, RMIT University, and the Workplace Research Centre, University of Sydney.

The report has also benefited from feedback from the anonymous reviewer and from NCVER.

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# Introduction

## Background to research program

This is a report of the first year of a three-year project, 'Vocations: the link between post-compulsory education and the labour market'. The aim of the project is to investigate whether education pathways, labour market pathways and links between the two could be improved if they were based on a modern notion of vocation. Vocation is a new term introduced by the research team and is not yet fully developed. One of the tasks of the research team over the next two years is to test the concept and develop an operational definition of 'vocation' and 'vocational stream'. The answer to this requires consideration of the following connected questions:

- What is the nature of educational pathways today?
- What is the nature of labour market pathways?
- How, if at all, are these different pathways connected?
- Is there a need to improve their operation?
- If so, could a modern notion of vocation be a useful and practical basis for reforming them?
- If not, is there any other basis on which they could be reformed?

The project is conducted in three strands. Strand 1 is investigating entry to vocations: how to improve occupational and further study outcomes for entry-level vocational education and training (VET), including VET in Schools and certificates I and II. Strand 2 is investigating the role of educational institutions in fostering vocations: how to improve occupational outcomes and educational pathways within VET, and between VET and higher education. Strand three is investigating the nature of vocations today: how to improve the development and use of skills within core sectors of the labour market, how to improve vocational pathways, and the changes needed to the institutional arrangements that mediate vocational pathways. To help link the analysis of the various strands, the group is looking at four industry case studies: the finance industry, primary industry, health and electrical trades/engineering.

During year one we have devoted most attention to understanding the reality of educational and labour market pathways in Australia today. Each research strand in this project has produced a working paper examining the nature and strength of the links in its own area, and found the links to be tenuous, weak, and discontinuous (Clarke & Volkoff 2012; Moodie 2012; Yu, Bretherton, Schutz & Buchanan 2012). Our premise is that, while educational pathways are essential, they are not sufficient for creating labour market pathways. The implications are that, while the relationship between work and education needs to be reconsidered by the supply side (education), so too does the structure and nature of the demand side (the labour market). We find, in short, that there is prima facie evidence for the proposition that education and labour market pathways could be improved if both were restructured around a modern, more expansive notion of vocation. Just how this might occur and whether it is in fact viable as a reform option will be explored in 2012 and 2013.

Strand 1 examined statistics on VET in Schools and is conducting four case studies in New South Wales, Queensland, South Australia and Victoria. It found that there are important policy and regulatory differences between VET in Schools in each state. The authors of Strand 1's working paper, Clarke and Volkoff (2012), found that, while the notion of VET is well understood, the 'in schools' part is less

well considered. They found that VET in Schools continues to struggle within the constraints of the senior secondary certification structures and is mediated by systemic, regional, and school-based factors. These factors need further analysis if the quality and outcomes of VET in Schools are to be improved.

Strand 2 analysed unpublished data from the Australian Bureau of Statistics' (ABS 2010) Survey of Education and Training to find that educational pathways vary within tertiary education by field of education. Most students undertake further qualifications in their original sector (VET or higher education) rather than move between sectors. Pathways between sectors vary by field of education. There are high levels of student transfer between VET and higher education where there are strong occupational pathways such as 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 and skills such as sales and marketing. There are lower levels of student transfer where occupational pathways are weaker, such as in the natural and physical sciences or liberal arts, 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 engineering.

Strand 3 analysed the work and study history, spanning nine years, of over 6000 individuals using nine waves or years of the longitudinal Household, Income and Labour Dynamics in Australia (HILDA) Survey. It found that, rather than individuals changing careers many times over their working lives, the Australian labour market is very stable and highly segmented. It distinguished three broad trajectories in their four industry case studies (primary industry, health, electrical/engineering and finance). The first is 'high skill trajectories', people have access to high-skill work, either by accumulating expertise in one role or by upward occupational mobility. The second is 'low skill trajectories', in which people are entrenched in low-skill occupations. The third is 'marginal attachment trajectories', characterised by clusters of inactivity that include periods of unemployment and time outside the labour force. Marginal attachment includes the unemployed, but also women moving in and out of the labour force, as well as older workers with decreasing attachment to the labour market.

## Context for research

The Australian Government has set targets to increase the percentage of the population with post-school qualifications and higher-level qualifications. These targets have two objectives: the first is to increase the skills of the population to ensure that Australia is competitive in the international economy and the second is to support social inclusion. The assumption of the first objective is that higher qualifications represent higher skills and that highly skilled workers are more productive. The assumption of the second objective is that those without post-school qualifications suffer higher levels of social exclusion because they are more likely to be unemployed or in casual, short-term employment with bleak career prospects. It assumes that educational progression is linked to occupational progression so that those who acquire higher-level qualifications can access more highly skilled work with better pay and other conditions.

Realising both objectives requires effective pathways within education and within work, and strong links between education and work. This project is designed to research these links and to explore the extent to which these pathways exist and the extent to which educational and occupational progression are linked.

There is extensive research on educational pathways, but almost no research on the extent to which students follow pathways within fields of education. There is rather less research on pathways within work and very little on the links between educational and occupational progression. While there is a great deal of research on the relation between qualifications and work, this focuses on the extent to which individuals can get jobs, the types of jobs they get and how long it takes to get them, their rates of pay and the return they get on their qualification (Fitzpatrick et al. 2011; Herault, Zakirova & Buddelmeyer 2011; Karmel & Liu 2011; Karmel & Nguyen 2006). Pocock (2009) and her colleagues (Pocock et al. 2011) have researched the extent to which VET qualifications provide those in lower-skilled jobs with access to higher-skilled jobs. There is also an emerging body of work on the 'match' between education and work (Karmel, Mlotkowski & Awodeyi 2008), the extent to which individuals feel their skills are being effectively deployed at work, and the extent to which their qualifications are matched to the kind of work they do (Mavromaras, McGuinness & Fok 2010; Mavromaras et al. 2011; Ryan & Sinning 2011). The National Centre for Vocational Education Research (NCVER) has, in recent years, published research on the structure of different industries and how this relates to qualifications (see for example, Evesson et al. 2009; Karmel & Blomberg 2009; Norton & Rafferty 2010).

However, most research on transitions within education, within work, and between education and work focus on a single transition. This characterises international comparative studies as well. Raffe (2008, p.283) says that 'there has been little comparative research on "yo-yo" transitions from education to the labour market and back again'. There are few Australian longitudinal studies that explore sequences of transitions. An exception is some work that uses the Longitudinal Surveys of Australian Youth (LSAY) and the NCVER Students Outcomes Survey (Anlezark 2011; Sherman 2006). There is very little research that seeks to understand *trajectories* and key transition points within these trajectories. Such research is needed to inform government policies that seek higher levels of participation and attainment in education, pathways within education, better links between education and work, and skills deepening for those already in work. These policies are predicated on the existence of links within education and work, and between education and work.

Given these concerns, NCVER has supported a three-year research program entitled 'Vocations: the link between post compulsory education and the labour market'. Earlier research by this research team (Buchanan, Yu, Marginson & Wheelahan 2009; Buchanan et al. 2010) identified that a key problem with education and labour market pathways in Australia today arises from policy and practice being structured on two very limiting approaches. These can be summarised as:

- *The competency-based training approach*: this approach dominates VET and the labour market for low- and medium-skilled jobs. It holds that education and work can be linked by workers, firms and registered training organisations (RTOs) endlessly recombining highly disaggregated units of competence in response to ever-changing circumstances.
- *The exclusory occupational closure approach*: coexisting with this approach is that of the tight specification of how educational qualifications link to tightly defined — often licensed — occupations. This approach is particularly prevalent in higher education and the upper reaches of the labour market.

In our earlier papers we argued that it might be more useful to structure education and labour market pathways on a different point of reference: what we called 'vocational streams'. These are more coherent ensembles of skill than those assumed in competency-based training, but equally they would not be as confined as tightly defined trades and professions. We have since developed our

understanding of vocational streams by drawing on the capabilities approach of the economics Nobel Laureate Amartya Sen (1985, 1992, 1999, 2000) and the philosopher Martha Nussbaum (2000).[1] We define vocations thus.

A vocation emerges from fields of practice where there are commonalities; for example, the commonalities between nursing, aged care and childcare. The vocation is care work and it is located within a 'care work' vocational stream. Vocational streams consist of linked occupations that relate to the core underpinning concept and set of practices; for example, care and care work. Vocational streams operate within broad fields of practice, where the focus is on the development of the person, the attributes they need and the knowledge and skills they require to work in a broadly defined field of practice that combines educational and occupational progression (Buchanan, Yu, Marginson & Wheelahan 2009). A vocation groups related clusters of knowledge and skills that allow individuals to progress and/or specialise within a field of practice, or to move laterally into related occupations. It is based on a continuum of knowledge and skill that links work, VET and higher education and is premised on the capacity to accrue skills in a coherent, cumulative fashion (Buchanan, Yu, Marginson & Wheelahan 2009, p.29). It fosters identification with the field of practice rather than a specific employer, enterprise, job or occupation.

Vocations are underpinned by capabilities. The capabilities approach relates the conditions individuals need to make choices about their lives, engage in work and progress through a career with the requirements of broad vocational streams. It focuses on what people need to be able to do to exercise complex judgments at work and what they need to be able to do in the future — rather than on workplace tasks and roles that have been defined for them or are based on existing or past practice. It focuses on what people need to be able to do in a range of related occupations.

Capabilities link individuals, education and work by identifying the individual, social, economic and cultural resources that individuals need to develop as autonomous, innovative and creative workers within broad vocational streams. Capabilities are differentiated from generic skills, employability skills or graduate attributes because they are not 'general' or 'generic'. In the capabilities approach, the focus is on the development of the individual and on work, and consequently students need access to the knowledge, skills and capabilities they need to work in their vocational stream. While there will be some commonalities, the nature of knowledge, skills and capabilities will differ between vocational streams. For example, 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.

The purpose of this discussion paper is to synthesise the findings from each strand's working paper and consider what they mean more broadly for the relationship between education and work. It uses three frameworks to undertake this analysis. The first is the literature on 'transition systems', which explores the way in which social institutions mediate the transition from education to work (mainly for young people) and transitional labour markets, which explores key transition points in individuals' lives and work. The second is the literature that examines the relation between economies, the state and education systems, such as the varieties of capitalism literature and the skills ecosystems literature. The third is on the capabilities approach. We have extended this literature to relate it to vocations and vocational streams.

[1] The capabilities approach is increasingly used in international and national public policy (Robeyns 2005; Henry 2007, 2009). This is discussed later in this paper.

This paper identifies a number of dilemmas. It looks at the disjuncture between the ostensible purpose of qualifications and the reality of how most are matched to work; the relative absence of occupational pathways; the potential for and limits to greater links between education and work, given the structure of our economy; and the extent to which policies about the relation between education and work can be realised.

# The story so far

The common theme running through the working papers prepared by each strand are the discontinuities within education, between education and work, and within work. Each has found that pathways, transitions, and outcomes are shaped by social and institutional factors that mediate the relation between education and work. In particular, the way occupations are structured within different segments of the labour market shapes the relation between education and work. Where there are strong occupational pathways with entry requirements specified and controlled by professional and occupational bodies, there are strong educational pathways *within* those occupations, but not necessarily for (usually) lower-skilled occupations in the same industry. The regulated occupations, which require relatively long training and the development of specific high-level knowledge and skills, such as in the skilled trades and some professions, have the strongest links between education and work. The links between work and education are much weaker in most areas of the labour market, and result in much more tenuous links between educational and occupational progression, with, consequently, weaker educational pathways within fields of education. The next stage of this project will research the extent to which improving educational and occupational pathways can achieve the government objectives of higher skills and social inclusion, or whether alternative approaches might be needed to achieve these outcomes, and whether (and if so how) the links between them can be improved.

## Strand 1: entry to work from school

Over 90% of Australian schools are now delivering some form of vocational education (Nguyen 2010). While most VET in Schools (VETiS) does not provide a strong, high-quality pathway to employment or further study, stronger outcomes have been experienced by students undertaking certificates III and above as part of their senior school certificates. The proportion of students participating in VET in Schools in certificate III and above is growing and varies significantly across the states and territories, with higher levels in Queensland and Victoria than in the other jurisdictions. Despite this growth, most (92%) VET qualifications completed within senior secondary certificates are at the certificate I and II levels. School-based apprentices and trainees make up 7.5% of all VET in Schools students and they are more likely to complete certificate III or above qualifications than other VET in Schools students. Vocational education in schools is being used to increase school retention and provide alternative pathways to work and further study for the majority of students not proceeding to university. However, VET in Schools is largely undertaken at certificate I and II levels by students from low socioeconomic backgrounds with low levels of academic achievement (Polesel 2008) and fails to provide a strong pathway to employment or further study. VET in Schools can be a social filter for low socioeconomic background students by placing them in non-university pathways, which do not necessarily result in higher retention rates to Year 12 or in strong connections to work or further study related to their VET in Schools (Polesel 2008; Anlezark, Karmel & Ong 2006; Nguyen 2010).

VET in Schools exists within complex policy environments. The way in which VET qualifications and vocational learning are accommodated within senior certificates affects the type and strength of the relation between VET in Schools and the labour market. Discussions of VET in Schools and its role as an entry to vocations for early school leavers and school completers need to be linked to our understanding of how the architecture of senior secondary certificates poses inadvertent barriers to

strong VET in Schools pathways and disincentives to students and schools to use and access vocational programs.

Clarke and Volkoff (2012) argue that, while the notion of VET is well understood, the 'in schools' part is less well considered. They find that VET in Schools continues to struggle within the constraints of the senior secondary certification structures and is mediated by systemic, regional, and school-based factors. These factors need further analysis if the quality and outcomes of VET in Schools are to be improved. In the next stage of this project, the researchers will explore: 'deep' or 'intense' models of vocational learning in schools, which they define as VET programs at certificate III or above; vocational learning in schools that has clearly defined links to occupations and the labour market; and/or a programmatic approach, in which a complete program of study is designed around an industry area and/or occupational pathway. As well as considering these models, they will examine the contexts in which vocational education in schools is delivered and how deep or intense models of VET in Schools can be supported. They will undertake qualitative analysis and mapping of VET in Schools in four regions by developing four case studies and a number of international comparisons.

## Strand 2: the nature of educational pathways and their links to the labour market

Educational pathways vary within tertiary education by field of education. Most students undertake further qualifications in their original sector (VET or higher education) rather than move between sectors. Pathways between sectors vary by field of education. There are high levels of student transfer between VET and higher education where there are strong occupational pathways such as nursing. There are also high levels of transfer between VET and higher education where related fields of education in each sector prepare students for the same industry but without strongly differentiated labour market outcomes or strongly differentiated requirements for knowledge and skills such as sales and marketing. There are lower levels of student transfer where occupational pathways are weaker such as in the natural and physical sciences or liberal arts, 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 engineering. Overall, the links between education and work 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 for their job. Similarly, there are mismatches between level of education and job, with many finding that their qualification is not used sufficiently in their job or that they need a higher-level qualification to do it (Mavromaras, McGuinness & Fok 2010; Mavromaras et al. 2011; Ryan & Sinning 2011).

Moodie (2012) argues that the idealised model of educational progression linked to occupational progression is not strong in Australia. There are exceptions such as nursing, but even here there are very few students transferring into entry-level nursing jobs from other related care occupations. He asks whether it is possible to create stronger links between education and work. In the next stage of this project, strand 2 will undertake qualitative research on the nature of the transition between qualifications in the four industry case studies as well as more quantitative exploration of patterns of student movement.

## Strand 3: the nature of labour market pathways and their links to education

Yu and her colleagues (2012) analysed the work and study history of over 6000 individuals, spanning nine years, using nine waves of the longitudinal Household, Income and Labour Dynamics in Australia (HILDA) Survey. They found that, rather than individuals changing careers many times over their working lives, the Australian labour market is characterised by occupational stasis and strong labour market segmentation. Many people stay in the same occupation for a long time.[2] Similarly, work histories are not characterised by individuals moving from lower- to higher-level skilled roles. Flows between occupational segments are limited, and those in lower-skilled occupations rarely move into higher-skilled occupations, although they 'churn' in a range of other lower-skilled occupations (see Sweet 2011 for similar findings).

Yu and her colleagues distinguished three broad trajectories within the four industry case studies (primary industry, health, electrical/engineering and finance). The first is 'high skill trajectories', which were characterised by access to high-skill work, either by accumulating expertise in one role or by upward occupational mobility. This mobility was observed mainly in higher-skilled occupations, where there are clearer pathways from higher education to professional work, and from professional to managerial roles. The second is 'low skill trajectories', which were characterised by entrenchment in low-skill occupations. This consisted mainly of those working in semi-skilled and unskilled roles with little movement to higher-skilled occupations. Occupational mobility, to the extent that it existed, was between semi-skilled and low-skilled occupations, with spells of unemployment or time outside the labour force, and was best described as high turnover. The third is 'marginal attachment trajectories', which are characterised by clusters of inactivity that include periods of unemployment and time outside the labour force. Marginal attachment includes the unemployed, but also women moving in and out of the labour force, as well as older workers with decreasing attachment to the labour market. Where paid employment exists, it is generally on the 'outskirts' of the labour market in low-skilled, marginal positions.

Yu and her colleagues found that there was significant heterogeneity between the different industry case studies, and they conclude that different institutional arrangements in each industry mediate the relationship between occupational and educational progression and the nature of the occupational pathways themselves. Some, such as the financial services industry use higher education qualifications to screen entry to the professions, while much training for the profession occurs on the job, often within internal labour markets (Buchanan, Yu et al. 2010). Higher education graduates also contributed to the low trajectory pattern by undertaking clerical roles. Primary industry is strongly segmented, with an ageing workforce and relatively low levels of educational attainment. Structural impediments to the low- to high-trajectory pathway include high entry-level costs for farming and equipment, poorly defined 'middle level' jobs and poor, often unregulated, work conditions (Evesson, Jakubauskas & Buchanan 2009). Healthcare and community services has strong occupational segmentation, with little cross-over between occupations, even though there may be pathways within occupations. It is a strongly regulated industry, one which specifies the qualifications and experience required for entry to and progression in high-skilled occupations, and increasingly also for lower-skilled occupations (Bretherton & Oliver 2008). Trades and engineering consist of relatively stable occupational segments, with entry requirements and standards governed by occupational bodies.

[2] Their data do not show if people move jobs within their occupation, or if they moved from more junior to senior roles within their occupation, but it does show if they moved from (for example) professional to managerial roles, or sales workers to community/personal service workers.

Trades workers were the most stable group, while there was movement between professional and managerial occupations. There was churn within lower-skilled occupations, which included some moving into and out of the trades. In the next stage of this project Yu and her colleagues will undertake qualitative research in the four industry areas to better understand workers' experiences and the factors that contribute to their occupational location, mobility and possibilities.

Strand 3's finding that trades workers were the most stable of the groups they investigated is consistent with Karmel, Lim and Misko's (2011) recent findings that:

> - Job and occupational mobility in the trades is not particularly different from that experienced in the professions, although there is considerable variation across the trades (and across the professions).
> - The rate of attrition in the trades is remarkably similar in good times and in bad times, although the balance between job losers and job leavers is affected by economic conditions. However, job churn within a trade is higher in good times, and this gives the impression to employers that attrition is higher.
>
> (Karmel, Lim & Misko 2011, p.26)

Interestingly, Karmel, Lim and Misko (2011) also found that the one trade occupation that stands out as good foundation for a future career is electrotechnology and communications. 'Electrotechnology and telecommunications trade workers are the highest-paid, have the highest prestige of the trades and on average move on to better jobs' (Karmel, Lim & Misko 2011, p.26). One might add that training for the electrotechnology and communications trades includes substantial education in mathematics and physics, and that it is regulated strongly.

## Concluding comments

Our key conclusions 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 of the 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.

Achieving government policy objectives to expand and deepen skills, increase productivity and use skills more effectively, increase the level of qualifications in the population, and contribute to social inclusion are not well served by the discontinuities within and between education and work. These links will need to be improved if government objectives are to be achieved. The next section of the paper explores the way in which we can make sense of these fragmented and segmented flows, using the notions of transition and capability.

# Transition systems and deepening capability

This section draws on two different 'transition' literatures. The first is on the educational 'transitions systems' literature (Raffe 2008), and the second is on the literature on 'transitional labour markets' (Schmid & Schömann [eds] 2003). These should perhaps be regarded as complementary literatures rather than different literatures. Raffe (2008, p.278) defines a transition system as those enduring institutional and structural arrangements that shape young people's transitions from education to work and their outcomes. Transition systems comprise different structural and institutional relations in education and the labour market, but they are also shaped by social welfare systems and family structures (Raffe 2008, p.277). Heinz (2009, p.392) says that 'transitions from education to employment evolve through time-dependent interactions of individual decisions and pathways in the context of institutions and changing opportunities'.

The Organisation for Economic Development and Cooperation (OECD 2000, p.13) thematic review on the transition from education to working life identifies six ingredients of effective transition systems. They are:

- 'A healthy economy
- Well organised pathways that connect initial education with work and further study
- Widespread opportunities to combine workplace experience with education
- Tightly knit safety nets for those at risk
- Good information and guidance
- Effective institutions and processes.'

They argue that a well-functioning economy is 'perhaps the most fundamental factor to shape young people's transition from initial education to work' (OECD 2000, p.13). Raffe (2008, p.291) argues that these are common or general components of successful transition systems, while they may require different policies in different countries to ensure they are implemented.

'Transition systems' is a broad heading to refer to the different approaches that are used to compare education and training systems in different countries. Raffe argues that the transitions systems approach has four achievements: first, 'the initial hypothesis of "institutional effects" has been supported'. That is, the structure of social institutions has an impact on transitions, and this in turn provides insight into the nature of social change and has implications for policy. Second, our knowledge of countries' comparative transition patterns has been improved. Third, several important characteristics of transition systems have been identified. And fourth and from the perspective of this project most importantly, it:

> has helped researchers and policy-makers to gain a better understanding of their own transition systems and their distinctive logics. It has provided conceptual tools for analysing a country's transition patterns and the institutional features which may explain them. (Raffe 2008, p.291)

There are also limitations in the transitions systems literature because of the paucity of data that can be used to compare countries. Raffe says the approach suffers from theoretical eclecticism and tends to result in a narrow focus on the education—work axis because these are the data that are available.

He says analyses 'often lack crucial information on topics [such] as social background, education and skills which are central to the analysis of transitions' (Raffe 2008, p.292).

Raffe (2008, p.292) argues that, while it has value, the educational literature on transition systems is not sufficient to conceptualise the way in which transitions take place and how transition systems change. He explains that this literature has demonstrated the path dependence of countries in the nature of their social and institutional structures, but it is less able to explain why and how transition systems change. He argues that we need to engage with theories of social change and the role of the nation state, and to draw on comparative political economy for explanations about how skills systems are structured, the relation between systems of skill formation and the state, variability within regions and between industries in nation states, and mutual influences and interrelationships between nation states.

We may add a further caveat to Raffe's: the education transitions systems literature is mainly used in studying young people's transitions, but arguably it can be used to study transitions between education and work more broadly. This is possible if a broader notion of transition is used to understand individuals' life trajectories. Transition refers to movement from one state to the other, such as from education to work, or work to unemployment or retirement. Trajectories, by contrast, refer to the general direction in which individuals' multiple transitions take them. This may include, among other things, trajectories that lead to higher- or lower-skilled jobs, to marginal attachment to work or to long-term secure careers, or to a sense of disengagement from work or to a sense of a calling in employment.

Buchanan and his colleagues (2009, p.11) draw on research on transitional labour markets that theorises the nature of working life so that it overcomes the limitations of linear models that posit unproblematic life transitions from youth to adulthood (and family) and education to work. They argue that working life 'is best understood as comprising a series of key transitions involving education, family formation, [and] spells outside of paid employment and retirement' (Buchanan, Yu, Marginson & Wheelahan 2009, p.11). They explain that the 'defining assumption of this model is that not only does the nature of work continually change, but so too do workers' preferences and working life choices'. And, as with young people, the structure of the economy, the labour market and social institutions affect the nature of individuals' transitions. Buchanan and colleagues (2009) argue that the intersection between Australia's social institutions and individuals' transitions results in fragmented flows of labour marked by deep inequalities. People can be at their most vulnerable during times of transition, and consequently policy should focus on providing support through transitions. Schömann and O'Connell (2003, p.19), both of whom are researchers within the transitional labour markets tradition, argue that:

> (1) Both initial investments in education and training, as well as the early experience of transitions, have lasting effects on entry into the labour market and subsequent labour market transitions; (2) segmentation tendencies early in the education system, and particularly at the time of entry and re-entry into the labour market, have a strong tendency to persist unless mitigated through transitional labour market arrangements which confer additional qualifications.

The next section draws on the varieties of capitalism literature and other models of skill formation processes to analyse the relation between the structure of the economy and education. It argues that these approaches are helpful in understanding national dynamics but that the skills ecosystems approach helps us to understand differences between regions and within industries. It then returns to the transitions systems literature to explore the difference between systems where vocational education follows an 'employment logic' and those where it follows an 'education logic' (Iannelli & Raffe 2007).

## The impact of the economy and social institutions on education

There is a body of literature that argues that the relation between social institutions in society shapes education systems and their relation to the economy. The 'varieties of capitalism' literature posits two main types of market economies: liberal market economies, typical of Anglophone countries; and, coordinated market economies, typical of Northern European countries, with varying points along the way (Hall & Soskice 2001). There are other approaches such as that of Ashton, Sung and Turbin (2000), who identify four models of skills formation associated with different types of economies: the 'market model' of the Anglophone liberal market economies; the corporatist model of Northern European countries; the 'developmental state' of industrialised Asian countries (Singapore, Japan, South Korea and Taiwan); and, neo-market models in countries such as Chile, Mexico and Brazil.

Liberal market economies use the market to coordinate the economy and to match graduates to jobs. Coordinated market economies use mainly non-market mechanisms to coordinate the economy, based on social partnerships between employers, workers and the state, and these mechanisms are used to match graduates with jobs. Each results in different 'systems of labour market regulation, of education and training, and of corporate governance' (Culpepper 2001, p.4). The skill formation system is different in each. There are tight links between work and education in the coordinated market economies (although this is mainly restricted to entry-level occupations for young people), reflected in strong apprenticeship systems that prepare young people for work and for citizenship more broadly.

The links between education and work are much looser in liberal market economies. The emphasis is on general education and on using qualifications to screen for entry into the labour market. Apart from the regulated occupations, where the professional and occupational bodies have strong input into curriculum, there is little direct engagement between education and work, as this is mediated by the market. Education is itself a market and institutions compete for funding and students. Graduates need skills to compete with each other in the market and broader knowledge and skills that can be used in a wider range of areas. Vocational education is developed in the absence of strong corporatist institutions and in countries such as the United Kingdom and Australia is based on industrial models which are 'functional, workplace focused and task-oriented' (Guthrie 2009, p.17).

The structure of senior secondary and post-school education reflects these differences in coordinated and liberal market economies. The Northern European coordinated market economies have tracked vocational and higher education systems: graduates go to different occupational destinations and draw on different knowledge and skills in each. Streaming between vocational and academic education starts in secondary school. The Anglophone liberal market economies tend to have unified secondary school systems, which emphasise academic or general education, and unified tertiary education systems where there may well be sectoral divides, but the differences are a matter of degree, not of type. These systems emphasise pathways between qualifications, sectors and to and from vocational and academic education. Australia is unusual because it has a liberal market economy with a unified secondary school system, but a tracked tertiary education system that differentiates between VET and higher education, which is characteristic of Northern Europe.

Bosch and Charest (2008, p.445) explain that coordinated and liberal market economies are trying to create bridges between vocational and academic education. They argue, however, that vocational education is being crowded out by academic education in liberal market economies, while in coordinated market economies the attempt to establish bridges is a response to the growing

complexity and knowledge requirements of different occupations, including the growing importance of soft skills. They conclude that:

> developments in vocational training cannot be understood solely by examining the inner dynamics of education and training systems. They do not acquire their societal significance and their value for companies and trainees until they are embedded in the labour market. In particular, differences in industrial relations, welfare states, income distribution and product markets are the main reason for the persistent high level of diversity in vocational training systems. The difference can perhaps be summarised as follows: in the coordinated market economies, the modernisation of vocational training is seen as a contribution to innovation in the economy, while in liberal market economies it is seen as a siding into which weaker pupils can conveniently be shunted. (Bosch & Charest 2008, p.445)

## Skills ecosystems

The relevance of the above analysis is that it helps to explain the weak relation between education and work in Australia. More nuanced analyses that distinguish between a broader range of economies and their relationship to the state are possible (for example, Ashton, Sung & Turbin 2000), but a broad analysis is adequate for our purposes, particularly since most analyses of liberal market economies and their relation to education and training are similar.

While nation states can be broadly understood as having liberal or coordinated market economies that shape their national system of institutions and provide the national context in which they operate, these typologies are less helpful for understanding regional diversity or diversity between industries. The skills ecosystems approach is premised on diversity between regions and within industries. Different ecosystems have different logics for the development of skills, the deployment of labour, and the relationships between social institutions. Buchanan, Schofield et al. (2001, p.21) define skills ecosystems as 'clusters of high, intermediate or low-level competencies in a particular region or industry shaped by interlocking networks of firms, markets and institutions'. Explanations that blame VET for economic underperformance, skill shortages and skill mismatches are not adequate because they do not take into account prior questions such as the nature of the demand side and how it is structured. The features structuring regional or sectoral skills ecosystems are:

- 'business settings (e.g. type of product market, competitive strategies, business organisation/networks, financial system)
- institutional and policy frameworks (VET and non-VET)
- modes of engaging labour (e.g. labour hire)
- structure of jobs (e.g. job design, work organisation)
- level and type of skill formation (e.g. apprenticeships, informal on-the-job training)'.

(Buchanan et al. 2001, p.22)

They argue that 'analysing the interaction between these inter-locking forces is necessary to understand changes to approaches to skill formation for a particular region or sector' (Buchanan, Schofield et al. 2001, p.22). The changing nature of the labour supply also affects the way skills ecosystems develop and the way skills are developed and deployed. Buchanan (2006, p.14) argues that 'changing life courses, especially concerning the roles of women and students in the workforce, have profoundly reshaped the options available to both workers and employers in recent years'. He says that, while the development and deployment of labour are matters to be considered in all skills ecosystems, the form it will take will differ between systems.

Skills ecosystems are able to account for change and development. They can be internally diverse, as exemplified by each of the four industry case studies undertaken by Strand 3 (Yu et al. 2012). Importantly, they will result in relations between education and work that are either tighter or looser, so that some (the regulated occupations) may be embedded in the occupational field of practice similar to coordinated market economies, while they will not, however, be identical to the coordinated market economies because they are located within a liberal market economy. Other skills ecosystems will have a contingent relationship between education and work. The skills ecosystems approach also provides insights into how we can improve links between education and work and consequently has implications for policy. This will be explored in the next stage of this project.

## Transition systems with an employment or educational logic

Iannelli and Raffe (2007) broadly define transition systems as having an employment or an educational logic. Systems (like those in coordinated market economies) with strong institutional links between work and education tend to follow an 'employment' logic, while systems (like those in Anglophone liberal market economies) with weak institutional links tend to follow an 'educational' logic. In systems with an employment logic, upper-level vocational education (usually upper-level vocational secondary education) has strong connections with work, but weak connections with higher education, except in some cases where higher education is in the same vocational area. Vocational qualifications are highly valued, and as a consequence, the difference between higher and vocational education cannot be reduced to simple status hierarchies. They explain that:

> Vocational programmes are less likely to be stigmatized or to signal low ability or low motivation to employers, because employers have more direct knowledge of the programmes and of the students they recruit. And young people have more contact with employers and easier access to recruitment networks. (Iannelli & Raffe 2007, p.50)

In contrast, transition systems, where the educational logic is dominant, have weaker links between education and work. Furthermore, vocational education is less differentiated from academic education, and there are stronger connections to tertiary education. Iannelli and Raffe (2007, p.51) state that vocational education:

> functions more straightforwardly as a part of the education system, and its relationship with academic upper-secondary education is defined more by its lower status than by its stronger orientation to employment. Employers select applicants with the greatest potential rather than those with vocational skills: potential is indicated by the level of study and attainment in education, and vocational qualifications may signal a low educational level.

These two concepts provide us with the tools to understand the dynamics in the Australian education and training system. They cannot by themselves account for the dynamics within education — for this we need a broader analysis — such as skills ecosystems — to provide insights into how skills ecosystems change and the impact this has on relations between education and work.

We can see both the educational and employment logics operating in Australia. Overall, Australia's education system follows an educational logic, and this helps to account for the low status of VET. It also accounts for the overall weak link between education and work. However, there are industries where the links between education and work are much stronger, such as in the regulated occupations. The occupational and professional bodies have much greater input into the development of these qualifications, but also students must undertake substantial learning in the workplace. This includes apprenticeships of course, but extends to professions. For example, Mather (2011, p.28) reports that

nurses must undertake mandatory work placements for 800 hours, secondary teachers for 60 days, engineers for 12 weeks, and social workers for 1000 hours.

Improving educational and occupational progression will require building links between education and work. This poses a number of dilemmas for our system, given the overall dynamics of liberal market economies and transition systems with educational logics. Raffe's (2008) point is, however, that transition systems can and do change (see also Bosch & Charest 2008). It is possible to consider the types of policy interventions that can help to achieve government objectives for education and its role in the economy as long as we understand the current dynamics. A later section outlines a number of dilemmas that have been identified by each strand in their discussion paper. It raises questions for discussion, and these will establish the basis for the next stage of the project, which will explore how we can link educational and occupational progression, using the broad concept of vocations.

## Capability: a better foundation for pathways?

Creating better links and flows within and between work and education will not occur in existing institutional structures in education and work and with existing models of qualifications in both higher education and VET. There needs to be greater coherence between qualifications in the sectors, based on a common understanding about the type of person, student and worker that we envisage. And, there needs to be a common understanding about how Australia wants work to develop in the future. We argue that the type of person envisaged in VET and the person in higher education are different; the person envisaged in higher education (including and particularly in the professions) is an autonomous individual who is a co-producer of their own learning, while in VET the person envisaged is one who is under the direction of others (Buchanan, Yu, Marginson & Wheelahan 2009). This undermines flows in and between education and work.

The innovation literature shows that workplaces that lead innovation are characterised by 'discretionary learning' (OECD 2010a). They require high levels of learning, problem-solving and task complexity, combine high levels of autonomy in work, have lower constraints on work pace, less monotony and less repetitiveness (OECD 2010b, p.36). The Business Council of Australia (2006, p.6) argues that innovation is 'the inspired application of knowledge (old or new) to create additional value' and that it extends to all areas of the business.

The workers envisaged in such enterprises (and economy) are required to have high levels of autonomy, be creative and exercise judgment. This in turn requires individuals with these attributes. The capability to exercise skill at work is an emergent property of more fundamental, complex and wide-ranging knowledge, skills and abilities. Capability arises from the interrelationship between personal, social and working lives, and that means learning *for* work needs to go *beyond* work.

The project team is drawing from the capabilities approach of economics Nobel Laureate Amartya Sen (1985, 1992, 1999, 2000) and the philosopher Martha Nussbaum (2000) to consider these issues. The capabilities approach is increasingly being used in economic and social policy. It underpins the United Nations' Human Development Index.[3] The previous Treasury Secretary, Ken Henry (2009, p.7), explains that the development of Treasury's wellbeing framework was heavily influenced by Sen's work. The capabilities approach is used to evaluate and assess individual wellbeing and assess individual, social and economic arrangements, social policy and proposals for change (Robeyns 2005, p.94).

[3] Amartya Sen's work underpins the United Nations' Human Development Index <http://hdr.undp.org/en/humandev/origins/>, viewed 29 January 2011. The Human Development Index is at this website: <http://hdr.undp.org/en/statistics/hdi/>, viewed 29 January 2011.

The capabilities approach aims to build people's capabilities to act in different ways. This provides the basis for human choice and autonomy. Ken Henry (2007) argues that:

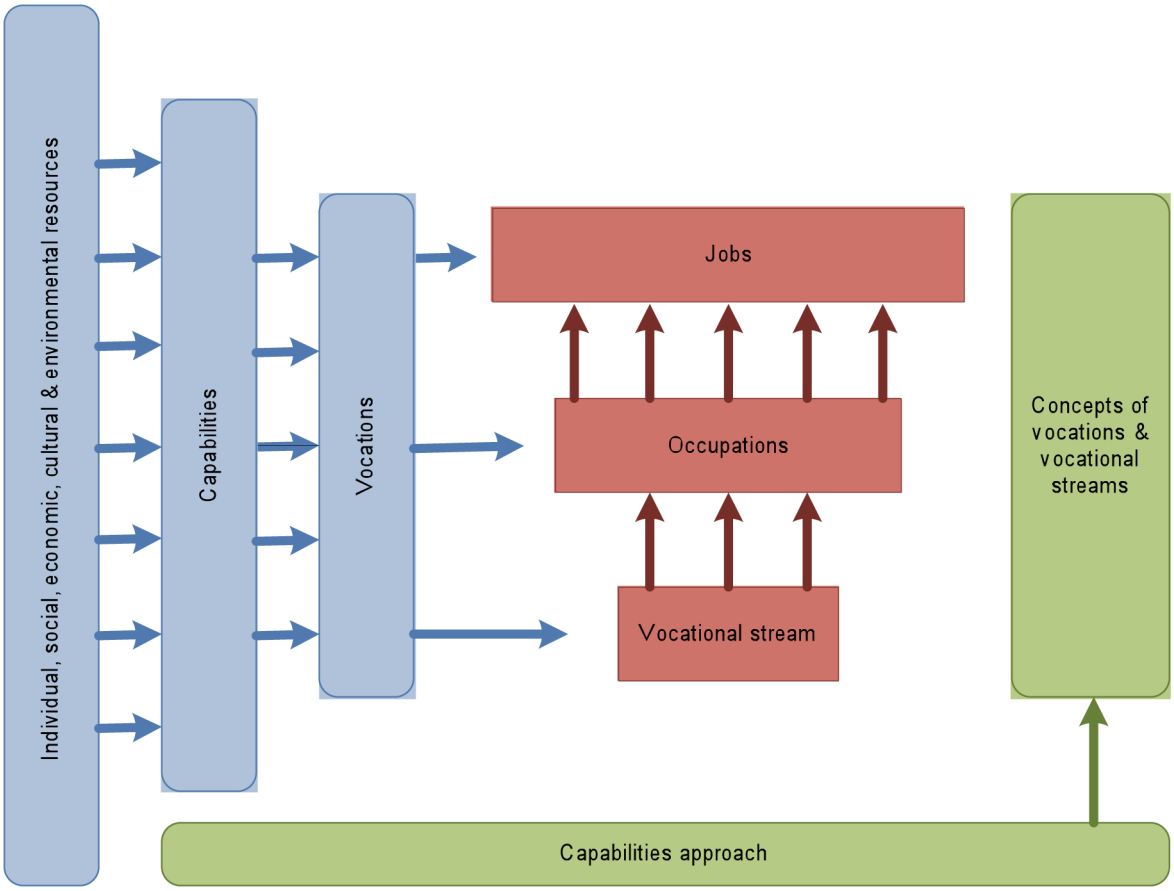
> Essentially, we must create a society in which all Australians have the opportunity to build a powerful set of capabilities — capabilities that allow all of us the freedom to choose to live our lives in ways that have real meaning and real value. This is not only vital for individuals, it is critical for our economy.

Capabilities refer to the *potential* to act in different ways, rather than the outcome that arises from the exercise of choice. Two individuals with a similar set of capabilities may have different lives because of the way they choose to use their capabilities. However, capabilities are not restricted to individual attributes: they include the individual, social, economic and environmental resources that individuals need as the basis for their capabilities. This is why the capabilities approach is used to evaluate social policy. Sen (2000) defines social exclusion as 'capability deprivation' and this arises when people do not have the capabilities they need to choose how they will live their lives. For example, he argues that someone without education or with poor health has a poorer capability set than someone with access to education and good health.

Vocations are underpinned by capabilities. The capabilities approach relates the conditions that individuals need to make choices about their lives, including choices about work and progress through a career, to the requirements of broad vocational streams. It focuses on what people need to be able to do to exercise complex judgments at work and what they need to be able to do in the future, rather than on workplace tasks and roles that have been defined for them or based on existing or past practice. The implications for education are that a concern with capabilities starts with the person, and not specific skills. It asks about the capabilities that people need to achieve a range of outcomes.

Capabilities link individuals, education and work by identifying the individual, social, economic, cultural and environmental resources that individuals need to develop as autonomous, innovative and creative workers within broad vocational streams. Capability is contextualised by the broader social and economic environment in which people live and work, and this means ensuring students have access to the knowledge, skills and capabilities they need to work in a vocation or broad occupational field. Capabilities are differentiated from generic skills, employability skills or graduate attributes because they are not 'general' or 'generic'. In the capabilities approach, the focus is on the development of the individual and on work, and consequently students need access to the knowledge, skills and capabilities they need to work in their vocational stream. While there will be some commonalities, the nature of knowledge, skills and capabilities will differ between vocational streams. This is depicted in figure 1 and explained in the text box.

**Figure 1 Relationship between capabilities, vocations and vocational streams**




**Relationship between capabilities, vocations and vocational streams**

Figure 1 shows the relationship between capabilities, vocations and vocational streams. Capabilities are underpinned by individual, economic, social, cultural and environmental resources. Capabilities 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 and depend 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. A vocation emerges from fields of practice where there are commonalities in the nature of practice and in 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 in vocational streams, rather than knowledge and skills for a specific job.

The team has not yet empirically identified vocational streams; however, Buchannan (2006, pp.15–16) and Buchannan and colleagues (2009) suggested these potential candidates:

- logistics
- care work
- customer service

- engineering
- business services
- IT/processing
- animal and land husbandry.

However, this requires more attention, both analytical and policy development.

## Rethinking vocational qualifications overseas

Related but different approaches are being developed overseas to rethink vocational qualifications. Fuller and Unwin (2003) propose the notion of expansive and restrictive participation to describe a continuum of different approaches to offering UK modern apprenticeships. Fuller and Unwin (2003, p.419) observe that the expansive approach includes:

- planned time off-the-job for reflection and exploration
- post-apprenticeship progression — envisioning trajectories, availability of role models
- opportunities for personal development by extending identity through boundary crossing.

The institutional features of an expansive approach to apprenticeships include:

- access to a range of qualifications including knowledge-based vocational qualifications
- explicit recognition in the employment relationship of, and support for, the apprentice's status as learner as well as employee
- highly developed reification of apprenticeship, connected with practice and accessible to all apprentices. (Fuller & Unwin 2003, p.423)

A recent European Union project investigated 'hybrid' vocational qualifications, which are qualifications that prepare graduates for 'qualified entrance to working life while at the same time opening access to higher education' (Deißinger et al. no date). The project investigated hybrid qualifications in Austria, Denmark, England and Germany. The aim was to contribute to European education and training policy 'to open up transition and progression between general, vocational and higher education ("vertical permeability"), as well as to link VET more reliably with the labour market ("horizontal permeability")' (Deißinger et al. no date).

## Conclusion and future directions

There are two contrasting and indeed contradictory trends in educational and labour transitions. The first is the atomisation of work roles and the vocational education that prepares graduates for these roles. This is seen in the narrowing of vocational qualifications to prepare graduates for specific work roles and jobs rather than occupations, let alone careers. It is also seen in the push to expand 'skills sets', which are training for parts of jobs rather than whole jobs. Also part of this trend is a conflation of education and work, which is seen in the basing of vocational education on work competencies and an increased emphasis of work-based training at the expense of education in educational institutions. This combination of a homogenisation of education and work and an atomisation of work and training seeks to collapse transitions between education and work, but it increases transitions from one narrow training job 'set' to another. It also increases the gulf between VET—work and other parts of education — school and higher education. One possibility would be to atomise and homogenise secondary and higher education and work, and the project has observed these tensions in VET in Schools. Indeed,

employers are starting to criticise both VET in Schools and higher education for not preparing 'work ready' students, overlooking school education's critical role in forming pupils as citizens and higher education's further citizenship role and role in generating new knowledge and innovation.

The other trend, which is described in this chapter, is to aggregate VET programs and occupations to reduce the number of transitions between different programs and occupations. This is seen, for example, in the modernisation of Australian industrial awards conducted from 2008 to 2010, which replaced some 1560 state and federal awards covering 93 industries and occupations with 122 modern awards (O'Neill 2011). Skills ecosystems construct clusters of occupations to overcome blockages in the labour market, which both reduce workers' ability to move to different occupations and employers' pool of potential workers. We have used the terms 'vocation' and 'vocational stream' to refer to these more general conceptions of programs and occupations. We found that the notion of capability is valuable since it combines individuals' attributes and the characteristics of their environment to describe their potential for action. Developing people's capability thereby involves their education and the construction of work, amongst other factors, and thus is a way of managing transitions between education and work without collapsing one into the other. The capabilities approach may also have the potential to prompt us to think afresh about productivity since this, too, involves both workers' attributes and the construction of work, as well as other factors.

Strong transitions within and between education and work rely on a high level of trust in qualifications and work experience. Some educational institutions and employers are known for the quality of their activities and so are trusted by people, other educational institutions and other employers. However, there are too many people, institutions and employers interacting in too many complex ways to rely on individual reputations alone. Strong transitions therefore depend on strong communities of trust, which are established and maintained by systems of certification and quality assurance. The next phase of the research will explore communities of trust within and between education and work and the systems that support them.

This next phase will also explore what is happening with intermediate skills, jobs and qualifications. The diploma qualification has been a 'cross over' qualification between vocational and higher education (Karmel & Nguyen 2003), yet diploma enrolments were static over the period 2003—07 and diploma graduates' occupation progression is being displaced by bachelor graduates (Karmel 2008). This could reflect changes in the nature of work as it becomes more complex and thus needing higher qualifications; or it may reflect credential creep — people seeking higher and higher-level qualifications to advantage them in the competition for jobs since many employers use qualifications to screen potential workers. Static enrolments and flat employment for diplomas may also reflect a change in the structure of the economy and labour market, such as from a possible 'hollowing out' of intermediate jobs (Cully 2003). This is raised and elaborated as a dilemma in the next chapter.

# Dilemmas

This chapter identifies key challenges in creating better links between education and work. The key dilemma for policy-makers is how to increase and strengthen the links between education and work where these are needed to achieve government objectives to increase productivity and social inclusion. Reforms to education since the late 1980s have consistently sought to create stronger links between education and work, with little success. The intention of VET in Schools was to provide better links between education and work, as was basing VET qualifications on workplace competencies. Universities have established stronger links with work by making their programs more vocational in orientation, introducing 'graduate attributes' and introducing work-integrated learning, or integrating work experience more or less closely with the curriculum. The Australian Qualifications Framework was introduced in 1995 to improve pathways between the sectors of education, and between work and education. However, while some progress has been made, the links between education and work remain tenuous, educational pathways within education are underdeveloped, and there are blockages within the labour market. This is so, even though we still experience skill mismatches and require substantial increases in the percentage of the population with post-school qualifications and higher-level qualifications (Skills Australia 2011).

The emphasis in policy has been on the supply side, and education has been identified as being responsible for the weak links (Goozee 2001). Only recently has the demand side come under scrutiny, with Skills Australia (2010a, p.45) claiming that:

> It was also widely recognised that Australia needs to address not only skills supply (the competence of the workforce) but skills demand (the effectiveness of the workplace in harnessing skills), as shaped by employer practices. To create a more productive economy requires employers to shift their business strategies to focus on differentiated or higher-end markets, and adopt forms of work organisation that require more skill and offer more opportunities for learning and development.

Clearly, tying education more firmly to work is not the solution, given that most people don't end up in jobs for which they are trained, yet this has been the consistent call from employer peak bodies, unions and governments over the last 20 years. The occupational structures that link education and work are generally absent, as are the pathways that link educational and occupational progression. Any long-term policy response will need to consider the kinds of social partnerships that are needed to support the development of better links between the two, and the implications for the way work and education are structured.

## Year 12 is no longer enough

Karmel and Lui (2011) have analysed how completing Year 12, undertaking VET or undertaking higher education contribute to successful post-school transitions for young people aged up to 25 years. They compared the outcomes for women and men separately, as there were strong gender differences. They also considered the outcomes for students who have a low academic orientation and those who have a high academic orientation. They find that completing Year 12 and going to university was the best option for females, regardless of whether they had a high or low academic orientation. The best options for young men were finishing Year 12 and undertaking an apprenticeship or going to university. They say:

> It seems that the Year 12 or equivalent debate is missing the point — that the successful paths tend to be Year 12 plus further study. Year 12 is no longer sufficient, and other paths involving Year 11 plus further training are not as good as Year 12 plus university or, for males, Year 12 plus an apprenticeship. Another point to emerge is that VET study is not always advantageous. Apprenticeships for males are clearly an attractive path for males, but traineeships or other VET study are generally ambiguous in their impact. It is more of a matter of 'it depends'. In some circumstances no doubt a VET path will be beneficial, but not necessarily.
>
> (Karmel & Liu 2011, p.29)

Fitzpatrick and his colleagues (2011, p.8) argue that changes to the labour market have made it more difficult for young people to make the transition from full-time education to full-time work. Growth has been mainly in highly skilled occupations that require higher levels of education, while casual and part-time jobs have grown more quickly than full-time and continuing employment, particularly for young people. Heinz (2009, p.392) argues that 'increasing labour market volatility and declining coordination between education, training and employment have been making [young people's] transition not only extended, but more precarious'. Fitzpatrick et al. (2011, p.28) distinguish between the time it takes young people to get 'any job, any job at all', and the time it takes for them to get their first full-time job. They find that, compared with early school leavers, students with Year 12 and higher-level qualifications take about the same time to get 'any job', while those with post-school education get their first full-time job quicker than those with just Year 12. It may be time to consider whether policy should emphasise the importance of Year 12 as a step to post-school study and not to work, given the outcomes of students who go straight from Year 12 to work.

## Rethinking VET in Schools

The original objectives of VET in Schools were to increase school retention rates and provide pathways for students to work or to further study. Rather than achieve these outcomes, VET in Schools has contributed to siphoning disadvantaged students into streams, with poor outcomes (Polesel 2008). The outcomes of VET in Schools suggest that it will need to be reconsidered, as will the way it is included in senior school certificates. The recent review of vocational education in England by Alison Wolf (2011, p.69, emphasis in original) has come to the same conclusion in arguing:

> What is crucial is that 14—19 education should equip young people to follow different routes successfully, and **not operate as a tracking system**. Vocational education needs to give all young participants the **skills they need for later progression**, including, if they wish, a return to education in later life; and it needs, critically, to address the diminishing opportunities for employment and genuine workplace experience that today's young people face.

She argues that the current focus of vocational education on qualifications derived from narrow industry requirements leads to poor student outcomes and a greater wedge between academic and vocational education:

> This argues strongly for quite general vocational programmes for any 14—19 year olds, as is, indeed, the case in almost all developed countries. (This is not just the case for school/college-based programmes. Apprenticeships in other European countries all involve a substantial amount of off-the-job general education.) However, **English education policy currently tries to enforce a bifurcated system in which either narrow, specifically occupational qualifications, or traditional academic qualifications are offered to 16—19 year olds.**
>
> (Wolf 2011, p.74, emphasis in original)

The project team will investigate whether a 'deeper' form of vocational education in VET in Schools should be developed, one which allows students to engage comprehensively in VET before undertaking the senior school certificates and which will help them to understand what VET is. Moreover, the project will attempt to develop a senior school study program primarily based in VET. At the moment in many states the structure of the senior school certificates is such that VET subjects are chosen individually, rather than coherent programs of VET study being available. However, students receiving high academic scores, which allow them to enter elite university programs such as medicine and law, are able to construct a program that prepares them for their vocation from a broad suite of available subjects. The same choice is not available to VET students, and where VET in Schools is based on training packages, it reflects the problems identified by Alison Wolf. A deeper notion of VET in Schools would reflect the approach in Northern European countries, where the purpose is to develop students as well-rounded citizens as well as knowledgeable and skilful workers (Clarke & Winch 2006).

## Is any job better than no job for social inclusion?

Fitzpatrick and colleagues (2011, p.29) say that differentiating between getting 'any job' and getting a full-time permanent job reflects academic and policy debates over the nature of transitions to work. They explain that:

> The first view suggests that rushing to get any job is better than getting no job at all. The idea is that obtaining any job reduces the risk of scarring and the human capital deterioration that follows prolonged periods of being out of work. The second view suggests that rushing to get any job increases the risk of getting a bad or a mismatched job, which in itself may reduce the chances of getting a better job later, thus locking the employee into a vicious circle of low-quality employment. (Fitzpatrick et al. 2011, p.29)

They argue that the empirical literature shows that there are elements of truth in both arguments.

In Australia, welfare-to-work policies and VET in Schools policies support getting 'any job' over having no job. Butterworth and his colleagues (2011, p.6) explain that 'Work-first policies are based on the notion that any job is better than none as work promotes economic as well as personal well-being'. They explain that, overall, those in employment have better mental health than those who are unemployed (Butterworth et al. 2011). However, their recent research shows that the extent to which the mental health of those who were unemployed improves once they gain employment depends on the quality of the job. Poor jobs are defined as those with 'low job control, high job demands and complexity, job insecurity and the perception of unfair pay' (Butterworth et al. 2011, p.7). They found that the mental health of those who moved from unemployment to poor jobs declined compared with those who remained unemployed. This cannot be reduced to individual attributes; they found that individuals reported significantly worse mental health when they were employed in poor-quality jobs compared with when they were unemployed, not in the labour force or working in better quality jobs (Butterworth et al. 2011, p.4). Moreover, the 'mental health of those in the poorest quality jobs declined more over time than the mental health of respondents who were unemployed' (Butterworth et al. 2011, p.5).

The connection between work and social inclusion and training in welfare-to-work programs needs to be reconsidered. Barnett and Spoehr (2008) argue that current welfare-to-work policies do not adequately distinguish between training for short-term, insecure employment and that required for high-quality employment. Churn in work and churn in low-level qualifications, where those who

already have qualifications (including higher-level qualifications) undertake certificates I and II, do not necessarily contribute to social inclusion, higher productivity or pathways to decent work, where educational and occupational progression are linked.

## The loose fit between work and qualifications means we need to rethink both

Strand 2's working paper reported on research that shows that the links between education and work are loose, and that there are high levels of mismatch between people's qualifications and their jobs, and between their skills and their jobs (Moodie 2012). Most people, other than those in the skilled regulated occupations, do not end up in jobs directly associated with their qualification (Karmel, Mlotkowski & Awodeyi 2008). At the sub-group level, only 30% of VET graduates in 2010 were employed in jobs directly associated with their qualification; 33% reported that their qualification had some relevance, while 15% said their qualification wasn't relevant to their job (NCVER 2010a, table 13). Only 11% of those who had undertaken management qualifications were in their intended occupation; while this rose to 54% of trades and technical workers. VET's qualifications are based on units of competence specified by industry which define workplace tasks and roles. If graduates do not work in jobs directly associated with their qualification, then we need to rethink what we mean by education that prepares students for work.

## Intermediate skills – the missing link?

There has been a 'hollowing out' of the middle of the skill distribution, while skills at the high and low end have increased (Cully 2003). Curtain (2003, p.1) argues that there has not been sufficient policy attention to intermediate skills and the adequacy of skills formation for intermediate skills. He cites the OECD in defining intermediate skills as:

> 'skilled' occupations requiring 'a high degree of skill, usually in a wide range of related activities, performed with minimal direction and supervision. In contrast to operatives, persons in such vocations are competent to carry out a broad range of related tasks'. (Curtain 2003, p.2)

These are the occupations that were serviced by certificates III and IV and by diplomas. As discussed below, graduates from these qualifications are most likely to report that their qualifications were not being sufficiently used. This suggests we may need to rethink the place of intermediate skills in Australia, particularly as there isn't a strong link between lower-level occupations and more skilled occupations. Developing more qualifications at the 'middle' level of the labour market will not solve the lack of continuity in the labour market, and will make it difficult to establish occupational pathways that are matched to educational pathways.

### There are problems with the diploma

Historically, the diploma has been an intermediate qualification that prepares people for jobs at that level and it has been a 'cross over' qualification between vocational and higher education (Karmel & Nguyen 2003). But diplomas are now declining in importance as an entry-level qualification to the labour market. Many of the jobs that required diplomas as the entry-level qualification now require degrees, and diploma and degree graduates now compete for the same jobs (Karmel 2010a). The group most likely to report that they are working at a level below that commensurate with their qualifications is those with diplomas and advanced diplomas (Skills Australia 2009, pp.8—9). There were more diplomas and advanced diploma graduates reporting that they were working at a level

lower than their qualification in 2007 than in 2001. In 2001 many more bachelor degree graduates reported that they were working at a level lower than their qualification than those with certificates III and IV, but this had reversed by 2007, when certificate III and IV graduates became the second highest group reporting that they were working at a lower level than their qualification (Skills Australia 2009, p.9). Karmel (2010b, p.54) says that there is an 'inexorable trend towards greater proportions of the workforce having formal and higher-level qualifications'. He presents evidence to demonstrate this is so, and suggests that the future of the diploma is problematic. He argues that:

> The policy challenge is to ensure that the position of diplomas and advanced diplomas is consolidated, by building up articulation arrangements with degrees where appropriate, and by improving the attractiveness of diploma and advanced diploma graduates for employers.
>
> (Karmel 2008, p.10)

## One qualification, many purposes

There is a conflict in the purposes of qualifications, particularly VET qualifications at diploma level. On the one hand, they are designed to prepare students for work; on the other hand, they are the main equity qualification in Australia because they are the transition or cross-over qualification for students from disadvantaged backgrounds who are over-represented in lower-level VET qualifications (Wheelahan 2010). There is a tension between the vocational and equity purposes of diplomas; they are designed to prepare students for specific jobs but many students use them mainly as a transition qualification to higher education (Stanwick 2006). There are similar findings in the United Kingdom. Ingram and Gallacher (2010) undertook research on foundation degrees in England and higher national diplomas and certificates in Scotland. All these are vocationally focused short-cycle higher education qualifications. They found that there is a continuum in the way students used these qualifications. At one end of the continuum are the qualifications that students use mainly to gain work in the associated field, while at the other end students used them mainly as a transition qualification to bachelor degrees. This suggests that, like Australia, England and Scotland have different skills ecosystems, where the relation between education and work is structured differently, based on different skills formation requirements.

In a draft paper discussing these findings Gallacher and his colleagues (2011, pp.2—3) argue that foundation degrees and higher national diplomas and certificates have three purposes: developing skills; enabling progression to bachelor degrees; and, increasing flexibility in and access to higher education. They argue that 'programmes which have their primary objective as vocational preparation cannot have widening access to higher education as an objective of equal strength' (Gallacher, Ingram & Reeve 2011, p.5).[4] They explain that, while these purposes do not necessarily conflict, they can nonetheless be difficult to reconcile. They argue that these qualifications should not be considered as a homogenous group as tends to be the case in policies in both countries, and that their multiple purposes need greater recognition. Similar arguments can be made about VET qualifications in Australia.

Arguably, the same applies to VET in Schools. By making equity its main focus, VET in Schools does not provide students with a sufficiently deep experience of VET to result in good vocational outcomes — whether this is defined as getting a sustainable, secure job or further, higher-level VET. This raises questions about the extent to which Australia has an overly homogenous approach to VET

[4] This view was expressed by the researchers in England and Scotland Leesa Wheelahan interviewed for this project, as well as policy leaders and senior managers in further education colleges she met as part of a joint LH Martin Institute and TAFE Directors Australia study trip in June—July 2011.

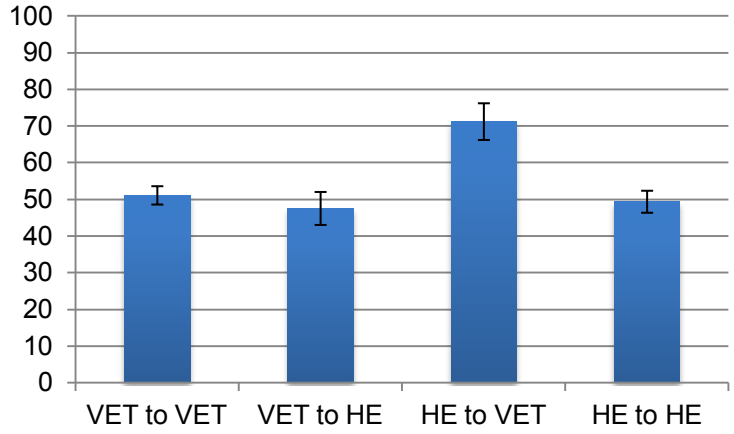
qualifications. In contrast, while arguably VET in Schools suffers from a lack of focus, higher education differentiates more between different types of qualifications and their different purposes by providing education for the professions and education in the 'pure' disciplines.

## Pathways within tertiary education are loosely linked

Most student articulation in VET and higher education is within each sector, rather than between them (Moodie 2012). Strand 2 has extended its analysis of unpublished data from the 2009 ABS Survey of Education and Training 2009 (ABS 2010) to find that graduate progression within fields of education varies by the broad field and sector of graduates' first qualification. Figures 2—7 and associated tables in the appendix are derived from the Survey of Education and Training. Standard errors and confidence intervals for the figures and tables were calculated using the jack-knife method of replicate weighting implemented in SAS.

Figure 2 and appendix table A1 in the appendix show the overall extent to which students change fields between a first and a second qualification. There are four possible post-school educational pathways that combine vocational education and higher education. These show that the proportion changing fields is around half for three pathways: 48% for VET to higher education transitions, 49% for higher education to higher education transitions and 51% for VET to VET transitions. However, 71% of students change field when making the transition from higher education to VET. Overall, 52% of students change fields when moving from their first to second qualification.

**Figure 2 Students changing fields between a first and second qualification for each pathway (%)**

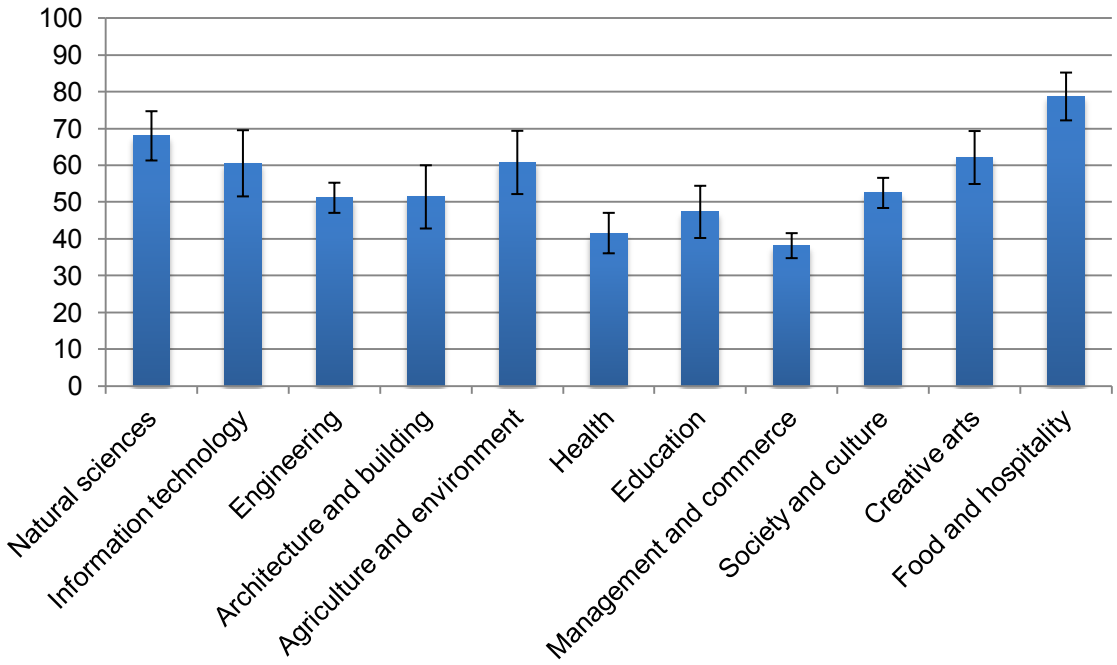



Note: 95% confidence intervals.
Source: Survey of Education and Training, 2009, unpublished data.

Figure 3 and the corresponding table A2 in the appendix show the overall change of field between a first and a second qualification for each broad field of education of a first qualification.[5] We can see a considerable variation, from a low of 38% in management and commerce, to a high of 79% in food, hospitality and personal services.

[5] For the purposes of this section we are disregarding the ASCED broad field 'mixed field'.

**Figure 3 Students changing fields between a first and second qualification for each field of first qualification (%)**




Note: 95% confidence intervals.
Source: Survey of Education and Training, 2009, unpublished data.

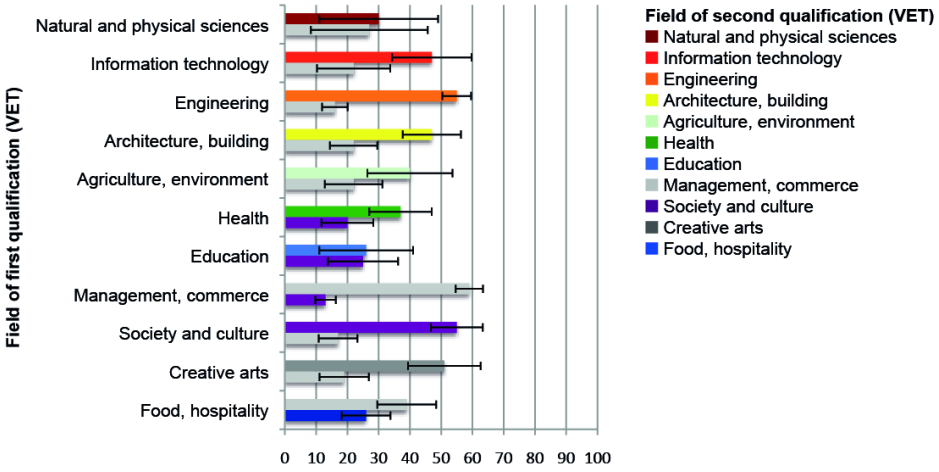
We examined field-to-field changes in more detail, considering the second field entered for each pathway. These results are presented in figures 4–7 and tables A3–A5. The confidence intervals shown in figures 2 and 3 indicate that these overall figures are quite reliable. However, the often small sample sizes in particular field-to-field combinations are reflected in some quite wide confidence intervals in figures 4–7. Nevertheless, the figures obtained give us a useful indication of trends. The discussion below will draw on the more reliable figures (generally from the fields with larger graduate numbers).

Figure 4 shows graduates whose first and second qualifications were in VET; the corresponding table A3 is in the appendix. The vertical axis shows graduates' first qualification, while the horizontal axis shows graduates' second qualification. It should be noted that, of the VET graduates in natural and physical sciences who gained a second qualification in VET, 30% gained it in management and commerce and 27% gained their second VET qualification in natural and physical sciences. Of VET engineering graduates who gained a second VET qualification, 56% gained their second VET qualification in engineering but, even so, 17% gained their second VET qualification in management and commerce.

Overall, of the VET graduates who acquired a second VET qualification, the highest proportion acquired it in the same field as their first qualification in eight of the 11 broad fields of education, although this was less than half. For example, 47% of VET information technology graduates undertook their VET second qualification in information technology, 36% of VET health graduates undertook their second VET qualification in health, and 26% of VET graduates in food, hospitality and personal services undertook their second VET qualification in the same field. It is also noteworthy that management and commerce was the most or second most popular field for VET graduates' second VET qualification

from ten fields. Overall, 31% of VET graduates undertook their second VET qualification in management and commerce.[6]

**Figure 4 First qualification is VET and second qualification is VET, by field of education**

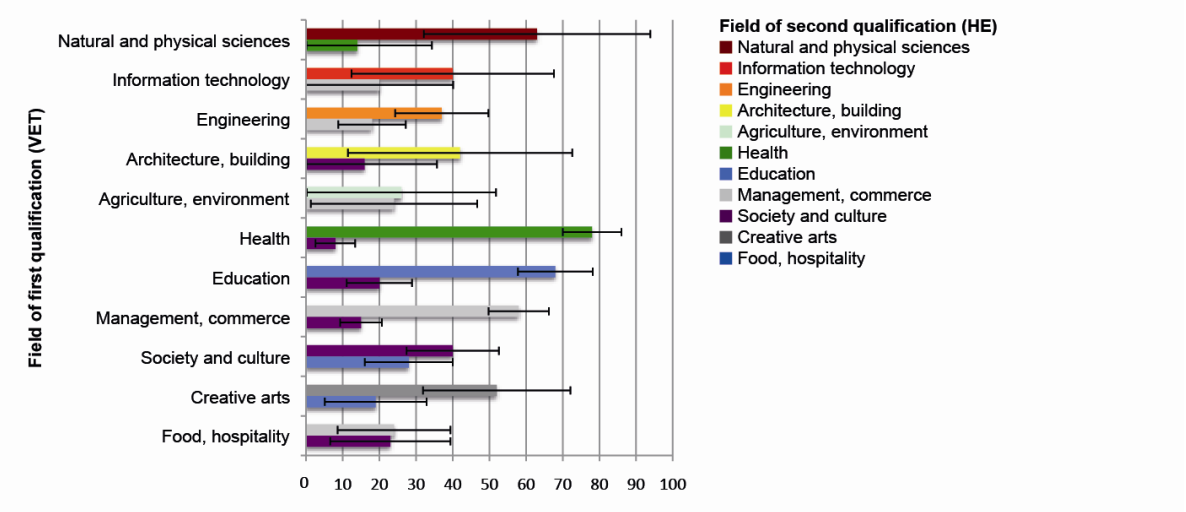



Note: 95% confidence intervals.
Source: Survey of Education and Training, 2009, unpublished data.

Figure 5 shows graduates whose first qualification was in VET and their second qualification was in higher education; the corresponding table A4 is in the appendix. It will be noted that of VET health graduates who acquired a second qualification in higher education, 78% did so in the same broad field of health. Half or more VET graduates in natural and physical sciences (63%), education (67.6%), management and commerce (59%) and the creative arts (52%) acquired their second qualification in the same field as their first qualification. However, of the remaining six fields of education, fewer than half of the VET graduates gained their second qualification in the same field as their first qualification. For example, only 37% of VET graduates in engineering and related technologies undertook their higher education qualification in the same field. Of the VET graduates who gained a second higher education qualification the highest or second highest proportion in six broad fields got their second qualification in society and culture and the highest or second highest proportion in five broad fields got their second qualification in management and commerce.

[6] The 95% confidence interval for this figure is 33.9% to 43.7%.

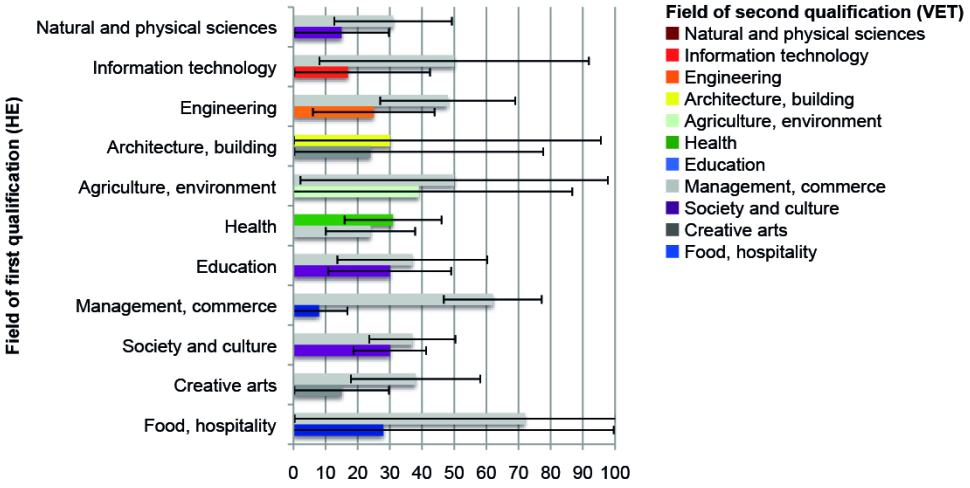
**Figure 5 First qualification is VET and second qualification is higher education by field of education**




Source: Survey of Education and Training, 2009, unpublished data.

Figure 6 shows graduates whose first qualification was in higher education and their second qualification was in VET; the corresponding table A5 is in the appendix. The number of transfers from higher education to vocational education is rather small and there are consequently considerable errors, but it will be noted that most higher education graduates in ten fields completed their second qualification in management and commerce in VET. Management and commerce was the second most popular field of education in one of the remaining two fields of education. Overall, 42% of higher education graduates who go to VET for their second qualification undertake it in management and commerce.[7]

**Figure 6 First qualification is higher education and second qualification is VET by field of education**



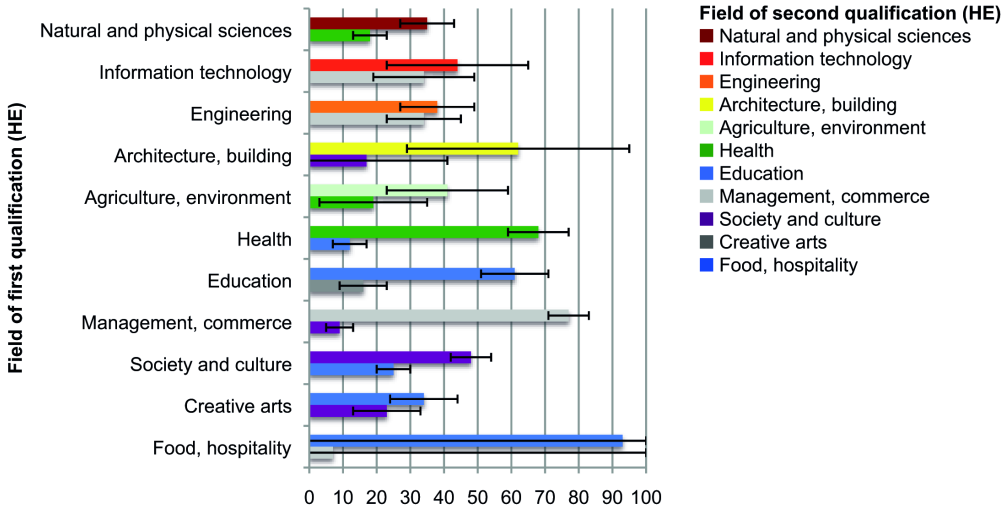

Note: 95% confidence intervals.
Source: Survey of Education and Training, 2009, unpublished data.

Figure 7 shows graduates whose first and second qualifications were in higher education; the corresponding table A6 is in the appendix. It will be noted that in nine broad fields the largest proportion of higher education graduates who gained a second higher education qualification gained it in the same field as their first qualification. Even so, in only a few broad fields did more than 50% of students acquire a second qualification in the same field as their first qualification: health (68%),

[7] The 95% confidence interval for this figure is 36.4% to 47.3%.

education (61%) and management and commerce (78%). It was close to half in society and culture (49%). Some health occupations such as nursing have graduate programs strongly related to occupational specialisation and progression and others split prequalifying studies between undergraduate and postgraduate programs. Education and management and commerce also have graduate programs strongly related to occupational specialisation and progression. Society and culture is mixed, but includes psychology, in which qualifying programs are typically split into undergraduate and graduate programs, and law, in which graduate programs are closely associated with occupational specialisation and progression. The most or second most popular field of education was management and commerce; however, this was the case in only five fields of education and the proportions were relatively small in some.

**Figure 7 First qualification is higher education and second qualification is higher education by field of education**




Note: 95% confidence intervals.
Source: Survey of Education and Training, 2009, unpublished data.

Overall, these figures show that only a minority of graduates get a second qualification in the same broad field as their first qualification and this varies markedly by broad field of education and sector. Within and between vocational and higher education pathways within fields of education aren't particularly strong. The data seem to support two contradictory interpretations and implications for policy. One possibility is that pathways within vocational and higher education and from vocational to higher education are underdeveloped and more work is needed to strengthen these pathways. On this interpretation the somewhat stronger pathways in higher education seem to reflect higher education's greater emphasis on preparing students for further education. But even so, only 35% of higher education graduates in the natural and physical sciences who get a second higher education qualification get one in the same broad field, and it seems less plausible that this indicates a weak pathway to higher-level study, since higher education programs in the natural and physical sciences are strongly oriented towards disciplinary knowledge and preparing students for further study. It is more likely that many students study natural and physical sciences in higher education as a preparation for a program that prepares them for an occupation in health, the field to which 18% of natural and physical sciences graduates move for their second higher education qualification.

Another possible interpretation is that the pathways within tertiary education aren't particularly strong, not because the links in tertiary education are underdeveloped, but because graduates' decisions on undertaking a second tertiary qualification are heavily influenced by their perception of

whether this may improve their job or career prospects. An implication of this interpretation is that, while tertiary institutions should do what they can to build pathways between programs in the same broad field in both their own and the other sector, they shouldn't invest too heavily in curriculum mapping and other labour-intensive activities, since this won't encourage many more students to follow these pathways. According to this interpretation, 'build and they will come' does not apply to pathways within tertiary education. A second implication of this interpretation is that graduates may be encouraged to proceed from one tertiary qualification to another by a labour market incentive.

There has been a steady decrease in the proportion of publicly funded vocational education studied mainly on campus, from 89% of all load in 1997, to 71% of total load in 2009, a fall of 18 percentage points. Most of the increase has been in work-based education, from 1% in 1997, to 12% in 2009, an increase of 11 percentage points (table 1). However, a large majority of publicly funded vocational education remains based on campus.

**Table 1 Publicly funded vocational education notional contact hours by study mode, 1997–2009 (%)**

| Study mode | 1997 | 1999 | 2001 | 2003 | 2005 | 2007 | 2009 | 1997–2009 |
|---|---|---|---|---|---|---|---|---|
| Campus-based | 88.5 | 83.5 | 81.1 | 80.4 | 76.6 | 75.3 | 70.5 | -18.0 |
| Remote access | 4.3 | 4.0 | 3.8 | 3.8 | 4.7 | 3.5 | 4.9 | 0.6 |
| Employment-based | 0.8 | 4.3 | 5.7 | 6.9 | 6.6 | 8.9 | 11.5 | 10.7 |
| Other | 5.1 | 5.5 | 6.5 | 5.8 | 9.4 | 8.6 | 7.2 | 2.1 |
| Not known/ not applicable | 1.3 | 2.7 | 2.9 | 3.0 | 2.7 | 3.8 | 5.9 | 4.6 |
| **Total** | **100** | **100** | **100** | **100** | **100** | **100** | **100** | **0** |
| **Total hours ('000 000)** | **283.9** | **299.6** | **341.7** | **356.6** | **362.0** | **390.1** | **438.9** | **155.0** |

Source: NCVER (2010b), Delivery hours by selected training characteristics and state and territory, 1996–2009.

Skills Australia (2010, p.27) notes that about 27% of campus-based students are studying for reasons relating to their current job, 23% are employed but studying in a field unrelated to their current job and about half (or 30% of all VET students) are unemployed or not in the labour force. So 73% of students studying on campus are not employed in the field in which they are studying. For most of these students vocational education is a preparation for their desired occupation and therefore the most important pathway is from vocational education to their desired occupation. About equal proportions of work-based VET students are trade apprentices and trainees, non-trade apprentices and trainees and workers training and retraining on the job (Skills Australia 2010b, p.27). Work-based VET students may be new to their occupation or deepening their expertise in their occupation, and so vocational education is both a pathway for entry to an occupation and progression in an occupation for work-based vocational students.

In 2010 some 80% of VET graduates and 72% of students who completed a module reported that their main reason for undertaking their VET study was related to employment (NCVER 2010a, table 1). Only 4.3% of graduates and 2.1% of module completers reported that their main reason for VET study was to undertake further study, and 15.4% of graduates and 26.4% of module completers said that their main reason for study was personal development. These proportions have remained fairly steady over the last five years except that the proportion of graduates whose main reason for VET study was personal development fell from 17.4% in 2005 to 15.4% in 2010 and the proportion of module completers who studied mainly for personal development fell from 29.6% to 26.4%. In contrast, 32% of VET graduates and 4.4% of module completers were enrolled in further study after completing their VET program in 2010 and this has also been steady since 2005 (NCVER 2010a, table 1). This may be because, although proceeding to further study wasn't the main reason VET students started their

study, it was a subsidiary reason and they pursue their subsidiary reason after completing their VET program. Alternatively, VET graduates may find that they need to undertake further study to achieve their main employment goal, or study may change their study goals.

## How can vocational pathways be constructed within vocational streams?

Dostal (2009, p.168) argues that: 'The declining stability of employment structures and the growing mobility of job holders reduces identification with employers and strengthens identification with occupation'. He refers to UNESCO's 'Hangzhou declaration' (UNEVOC 2004), which specifies 12 broad vocational disciplines:

- business and administration
- production and manufacturing
- civil engineering
- electrical and electronic, engineering and information and communication technology
- process engineering and energy
- health care and social care
- education and culture
- leisure, travel and tourism
- agriculture, food and nutrition
- media and information
- textile and design
- mining and natural resources (Dittrich 2006, p.3).

Dostal (2009, p.165) writes that:

> From the point of view of vocational training those occupational areas or fields are of far higher significance than single occupations and they characterise the stability of the occupational landscape in the long run.

One possibility might be to try to strengthen pathways within post-compulsory education and from post-compulsory education to work by basing vocational post-compulsory education on broad vocational disciplines or streams. Vocational streams would be constructed jointly by educational institutions, occupational bodies and skills councils. The aim would be to relate vocational post-compulsory qualifications to occupations, but with the breadth and preparation to proceed to other occupations within the vocational stream.

There are isolated examples of strong educational and occupational pathways, such as from the diploma of nursing to become an enrolled nurse, to the bachelor of nursing to become a registered nurse. Most of these examples are in the strongly regulated occupations and one possibility would be to integrate currently isolated licensing arrangements. For example, aged care licensing could be integrated with health care licensing to build an educational and occupational pathway from personal care attendant to division 2 nurse. Indeed, Germany's dual system of vocational education comprises some 150 occupations regulated at the national, state and regional levels. While there may be scope to extend pathways in this way, the extensive regulation in Germany's coordinated market economy is unlikely to be introduced into Australia's liberal market economy. However, governments have other ways of supporting occupational and educational pathways in its own employment, in its procurement policies and in its labour market programs (Bosch & Charest 2008, p.444).

# Conclusion – issues for further investigation

Each stream's working paper and this discussion paper have raised several issues to be investigated in subsequent stages of this project.

## Strengthening VET in Schools

The outcomes for most pupils who complete VET in Schools are not strong and this in turn may reflect, at least partly, weaknesses in the way VET in Schools is currently constructed. Most VET in Schools offerings have no internal logic. Many VET in Schools pupils don't complete a VET qualification and even those who do are able to do so without undertaking a coherent program of study, since most training programs have only weak patterning requirements. This may reflect the way some jobs are organised but generally VET in Schools does not have any other coherence, particularly for the majority of graduates who are not employed in the jobs for which they have ostensibly been prepared.

From the work done for this project so far it appears that VET in Schools is not a strong preparation for further vocational education. Polesel (2008) argues that in Victoria transition from VET in Schools programs to post-school VET has actually declined over recent years. One reason is that many TAFE institutes do not give appropriate recognition for VET qualifications completed in schools, notwithstanding that this is required by the former Australian Quality Training Framework, now the VET Quality Framework. Regardless of whether TAFE institutes' scepticism of VET in Schools is justified or not, there is clearly a need to rebuild confidence in VET in Schools. It is equally clear that the arrangements for assuring the quality of VET that are being implemented over the next few years will not improve confidence in VET in Schools since they will not be materially different from the quality assurance arrangements that have eroded trust in VET in Schools.

From the project's work so far and from NCVER's research, it appears that pupils whose path constitutes no more than school to work do not have good prospects for rewarding work and successful careers. The best outcomes are enjoyed by pupils of both sexes who proceed from school to vocational or higher education and pupils who proceed from school to apprenticeships in the traditional trades, which are dominated by men. Recent research (Australian Council for Educational Research 2008; Polesel & Volkoff 2009) notes the strong gender biases in school-delivered VET. While there are problems with the design of VET in Schools and the way it is implemented in schools, as discussed in this report, these post-school outcomes cannot be solely attributed to VET in Schools. The fact that school to work alone is a generally poor outcome in all states, for all types of schools and for all types of programs (VET in Schools, academic senior secondary certificate, Victorian Certificate of Applied Learning) suggests that, in addition to whatever failings there may be in schools, poor outcomes are due at least partly to changes in employers' demands. It also seems possible that this may be a continuing trend.

## Intermediate skills

From other work and its own investigations, the research team has found in its own work that intermediate skills are not being developed well in many occupations. This may be contributing to the apparent decline in the importance of diplomas as the 'cross over' qualification between

vocational and higher education and between skilled and professional occupations. Strengthening the development of intermediate skills is important: to meet employers' needs for higher skilled and professional workers; to improve labour mobility; to improve educational mobility and, hopefully, to improve the links between education and work. The team will consider how these goals may be achieved.

## Capability

The research team has posited the notion of capability to link education and general personal development with employment and broader social participation. The concept is powerful because it focuses on individuals' agency — their capacity and opportunities to realise their ambitions. It can be used to identify the economic, social, and cultural resources that are needed to develop capability. The way we are using capability is to anchor it in the vocational field of practice to identify the types of capabilities that are needed for the development of autonomous workers who can contribute to innovation. Using this approach therefore may be a way of understanding how training and work may be constructed to strengthen pathways within and between education and work. We have suggested the ideas of vocations and vocational streams to link occupations that share characteristics, which may provide opportunities for progression and give meaning to progression from one job and occupation to another. Vocational streams may also identify opportunities to fill educational and workforce gaps to develop intermediate skills. These ideas are conceptual at this stage and considerable work will be needed to make them analytically robust and for their empirical foundation to be tested such that they are implementable in policy.

## Communities of trust (and mistrust)

Another major issue for the team to investigate is the structures and processes that build trust between educational institutions and sectors, between employers and labour sectors, and importantly between education and work. This is a crucial issue because transitions within and between education and work depend on institutions and employers having confidence in people's previous training and work experience. It is also important to give people the confidence that investing their time and effort in advancing their education and training will have employment and broader rewards.

# References


Anlezark, A 2011, *At risk youth: a transitory state?*, NCVER, Adelaide, viewed 21 March 2011, <http://www.lsay.edu.au/publications/2342.html>.

Anlezark, A, Karmel, T & Ong, K 2006, *Have school vocational education and training programs been successful?*, NCVER, Adelaide, viewed 6 June 2007, <http://www.ncver.edu.au/students/publications/1654.html>.

Ashton, D, Sung, J & Turbin, J 2000, 'Toward a framework for the comparative analysis of national systems of skill formation', *International Journal of Training and Development*, vol.4, no.1, pp.8—25.

ABS (Australian Bureau of Statistics) 2010, *Education and training experience*, cat.no.6278.0, ABS, Canberra, viewed 30 March 2010, <http://www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/0/4EF49EB9552322F4CA2576F500120083/$File/62780_2009.pdf>.

Australian Council for Educational Research 2008, *LSAY briefing number 15*, ACER, Camberwell.

Barnett, K & Spoehr, J 2008, *Complex not simple: the vocational education and training pathway from welfare to work*, NCVER, Adelaide, viewed 30 August 2009, <http://www.ncver.edu.au/publications/1987.html>.

Bosch, G & Charest, J 2008, 'Vocational training and the labour market in liberal and coordinated economies', *Industrial Relations Journal*, vol.39, no.5, pp.428—47.

Bretherton, T & Oliver, D 2008, *Identifying paths to skill growth or skill recession: a literature review on workforce development in the community services and health industries*, Community Services and Health Industry Skills Council, Sydney, viewed 15 August 2009, <https://www.cshisc.com.au/index.php?option=com_docman&task=cat_view&gid=36&Itemid=79>.

Buchanan, J 2006, *From 'skill shortages' to decent work: the role of better skill ecosystems*, Board of Vocational Education and Training, NSW, Sydney, viewed 17 January 2010, <https://www.training.nsw.gov.au/forms_documents/industry_programs/workforce_development/skill_ecosystem/buchanan.pdf>.

Buchanan, J, Schofield, K, Briggs, C, Considine, G, Hager, P, Hawke, G, Kitay, J, Meagher, G, Macintyre, J, Mounier, A & Ryan, S 2001, *Beyond flexibility: skills and work in the future*, Australian Centre for Industrial Relations Research and Training, University of Sydney, and Research Centre for Vocational Education and Training, University of Technology, Sydney, Sydney, viewed 6 May 2004, <http://www.skillecosystem.net/data/files/general/Beyond%20Flexibility.pdf>.

Buchanan, J, Yu, S, Marginson, S & Wheelahan, L 2009, *Education, work and economic renewal: an issues paper prepared for the Australian Education Union*, Workplace Research Centre, University of Sydney, Sydney, viewed 26 August 2009, <http://www.aeufederal.org.au/Publications/2009/JBuchananreport2009.pdf.

Buchanan, J, Yu, S, Wheelahan, L, Keating, J & Marginson, S 2010, *Impact analysis of the proposed strengthened Australian Qualifications Framework conducted for the Australian Qualifications Framework Council (AQFC)*, Workplace Research Centre, University of Sydney, Sydney, viewed 25 October 2010, <http://www.aqf.edu.au/Portals/0/Documents/AQFC%20-%20impact%20analysis%20-%20final%208Oct10%20(3).pdf>.

Business Council of Australia 2006, *New concepts in innovation: the keys to a growing Australia*, Melbourne, viewed 11 November 2011, <http://www.bca.com.au/Content/100408.aspx>.

Butterworth, P, Leach, L, Strazdins, L, Rodgers, B, Olesen, SC, Rodgers, B & Broom, DH 2011, 'The psychosocial quality of work determines whether employment has benefits for mental health: results from a longitudinal national household panel survey', *Occupational and Environmental Medicine*, vol.68, no.11, pp.806—12, viewed 25 July 2012, <http://oem.bmj.com/content/68/11/806>.

Clarke, K & Volkoff, V 2012, *Entry to vocations: current policy trends, barriers and facilitators of quality VET in Schools*, NCVER, Adelaide.

Clarke, L & Winch, C 2006, 'A European skills framework? But what are skills? Anglo-Saxon versus German concepts', *Journal of Education and Work*, vol.19, no.3, pp.255—69.

Cully, M 2003, *Pathways to knowledge work*, NCVER, Adelaide, viewed 10 June 2004, <http://www.ncver.edu.au/publications/927.html>.

Culpepper, PD 2001, 'Employers, public policy, and the politics of decentralized cooperation in Germany and France', eds PA Hall & D Soskice, *Varieties of capitalism the institutional foundations of comparative advantage*, Oxford University Press, pp. 275—306.

Curtain, R 2003, *The intermediate skills pool, new apprenticeships and skill shortages*, Curtain Consulting, Melbourne, viewed 12 September 2010, <http://www.curtain-consulting.net.au/download_controlled/Skill%20formation/sub101.pdf>.

Deißinger, T, Aff, J, Fuller, A & Jorgensen, CH no date, '"Hybrid qualifications" — increasing the value of vocational education and training in the context of lifelong learning', viewed 19 November 2011, <http://hq-lll.eu/index.html>.

Dittrich, J 2006, 'Vocational disciplines — how could a general framework look like?', *Innovation and internationalisation in the qualification of technical and vocational education and training (TVET) experts*, Colombo, Sri Lanka, 23—25 November 2006, viewed 2 March 2011, <http://www.unip-net.org/modules.php?op=modload&name=UpDownload&file=index&req=getit&lid=49>.

Dostal, W 2009, '3.1.1 Occupational research', eds F Rauner & R MacLean, *Handbook of technical and vocational education and training research*, Springer, New York.

Evesson, J, Jakubauskas, M & Buchanan, J 2009, *Choosing a sustainable future: workforce development in Victorian primary industries, r*eport prepared by the Workplace Research Centre, University of Sydney for the Victorian Department of Innovation, Industry and Regional Development, Sydney.

Evesson, J, Bretherton, T, Buchanan, J, Rafferty, M & Considine, G 2009, *Understanding vocational education and training, productivity and workforce participation: an issues paper*, NCVER, Adelaide, viewed 6 September 2010, <http://www.ncver.edu.au/publications/2154.html>.

Fitzpatrick, D, Lester, L, Mavromaras, K, Richardson, S & Sun, Y 2011, *From education to employment: how long does it take?*, NCVER, Adelaide, viewed 14 July 2011, <http://www.ncver.edu.au/publications/2373.html>.

Fuller, A & Unwin, L 2003, 'Learning as apprentices in the contemporary UK workplace: creating and managing expansive and restrictive participation', *Journal of Education and Work*, vol.16, no.4, pp.407—26.

Gallacher, J, Ingram, R & Reeve, F 2011, *Are* vocational *qualifications vocational? Draft*, Centre for the Research in Lifelong Learning, Glasgow Caledonian University, Glasgow.

Goozee, G 2001, *The development of TAFE in Australia*, NCVER, Adelaide, viewed 6 February 2004, <http://www.ncver.edu.au/publications/574.html>.

Guthrie, H 2009, *Competence and competency-based training: What the literature says*, NCVER, Adelaide, viewed 7 July 2009, <http://www.ncver.edu.au/publications/2153.html>.

Hall, PA & Soskice, D 2001, 'An introduction to varieties of capitalism', in *Varieties of capitalism: the institutional foundations of comparative advantage*, eds PA Hall & D Soskice, Oxford University Press, pp.1—68.

Heinz, WR 2009, 'Structure and agency in transition research', *Journal of Education and Work*, vol.22, no.5, pp.391—404.

Henry, Ken 2007, 'Creating the right incentives for Indigenous development', Cape York Institute Conference: *Strong foundations — rebuilding social norms in Indigenous communities*, Cairns, 26 June, viewed 29 January 2011, <http://www.treasury.gov.au/documents/1275/HTML/docshell.asp?URL=070624_CYI.htm>.

——2009, 'Fiscal policy: more than just a national budget', 2009 Whitlam Institute Symposium, 30 November, viewed 29 January, 2011 <http://www.whitlam.org/__data/assets/pdf_file/0006/111687/Whitlam_Institute_Speech2.pdf>.

Herault, N, Zakirova, R & Buddelmeyer, H 2011, *The effect of VET completion on the wages of young people*, NCVER, Adelaide, viewed 14 July 2011, <http://www.ncver.edu.au/publications/2379.html>.

Iannelli, C & Raffe, D 2007, 'Vocational upper-secondary education and the transition from school', *European Sociological Review*, vol.23, no.1, pp.49—63.

Ingram, R & Gallacher, J 2010, *HN tracking study: 2nd interim report*, Centre for Research in Lifelong Learning, Glasgow Caledonian University, Glasgow, viewed 8 August 2011, <http://www.crll.org.uk/media/crll/content/publications/researchreports/HNTrack2ndInterimReportNov2010.pdf>.

Karmel, T 2008, *What has been happening to vocational education and training diplomas and advanced diplomas?*, NCVER, Adelaide, viewed 9 February 2009, <http://www.ncver.edu.au/publications/2090.html>.

——2010a, 'A changing labour market and the future of VET', Centre for the Economics of Education and Training Conference: *Education and training for a more productive Australia*, Melbourne, viewed 18 March 2011, <http://www.education.monash.edu.au/centres/ceet/publications/conferencepapers/2010.html>.

——2010b, 'The future of VET: or, Allen Ginsberg revisited', eds F Beddie & P Curtin, *The future of VET: a medley of views*, NCVER, Adelaide, viewed 19 August 2010, <http://www.ncver.edu.au/publications/2284.html>

Karmel, T & Blomberg, D 2009, *Workforce planning for the community services and health industry*, NCVER, Adelaide, viewed 15 August 2011, <http://www.ncver.edu.au/publications/2143.html>.

Karmel, T, Lim, P & Misko, J 2011, *Attrition in the trades*, NCVER monograph series 07/2011, NCVER, Adelaide, viewed 20 November 2011, <http://www.ncver.edu.au/publications/2420.html>.

Karmel, T & Liu, S-H 2011, *Which paths work for which young people?*, NCVER, Adelaide, viewed 11 August 2011, <http://www.lsay.edu.au/publications/2397.html>.

Karmel, T, Mlotkowski, P & Awodeyi, T 2008, *Is VET vocational? The relevance of training to the occupations of vocational education and training graduates*, NCVER, Adelaide, viewed 5 August 2009, <http://www.ncver.edu.au/publications/2013.html>.

Karmel, T & Nguyen, N 2003, 'Australia's tertiary education sector', Centre for the Economics of Education and Training 7th National Conference, Monash University, Melbourne.

——2006, *The value of completing a vocational education and training qualification*, NCVER, Adelaide, viewed 5 August 2009, <http://www.ncver.edu.au/publications/1713.html>.

Mather, J 2011, 'Costs soar as calls for placements climb', *The Australian Financial Review*, 25 July, p.30.

Mavromaras, K, McGuinness, S & Fok, YK 2010, *The incidence and wage effects of overskilling among employed VET graduates*, NCVER, Adelaide, viewed 21 January 2011, <http://www.ncver.edu.au/publications/2231.html>.

Mavromaras, K, McGuinness, S, Richardson, S, Sloane, P & Wei, Z 2011, *Over-skilling and job satisfaction in the Australian labour force*, NCVER, Adelaide, viewed 7 June 2011, <http://www.ncver.edu.au/publications/2365.html>.

Moodie, G 2002, 'Identifying vocational education and training', *Journal of Vocational Education and Training* vol.54, no.2, pp.249—65.

——2012, *The role of educational institutions in fostering vocations*, NCVER, Adelaide.

NCVER (National Centre for Vocational Education Research) 2008, *2006 VET in Schools statistics: a report for the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) Secretariat: Draft report 1*, Adelaide, NCVER, viewed 8 March 2009, <http://www.mceetya.edu.au/verve/_resources/2006_MCEETYA_VET_in_Schools_report.pdf>.

——2010a, *Australian vocational education and training statistics: student outcomes 2010*, NCVER, Adelaide, viewed 6 December 2010, <http://www.ncver.edu.au/publications/2315.html>.

——2010b, *Vocational education & training in Australia from 1981*, NCVER, Adelaide, viewed 15 November 2010, <http://www.ncver.edu.au/statistic/publications/2244.html>.

Nguyen, N 2010, *The impact of VET in Schools on the intentions and achievements of young people*, NCVER, Adelaide, viewed 4 November 2010, <http://www.ncver.edu.au/publications/2294.html>.

Norton, K & Rafferty, M 2010, *Work, skills and training in the Australian red meat processing sector*, NCVER, Adelaide, viewed 14 November 2010, <http://www.ncver.edu.au/publications/2301.html>.

Nussbaum, MC 2000, *Women and human development: the capabilities approach*, Cambridge, Cambridge University Press (kindle book).

O'Neill, S 2011, 'Chronology of fair work: background, events and related legislation, background note', viewed 19 November 2011, <http://www.aph.gov.au/library/pubs/bn/eco/Chron_FWAct.htm>.

OECD (Organisation for Economic Co-operation and Development) 2000, *From initial education to working life: making transitions work*, Paris, viewed 15 August 2011, <http://www.oecdbookshop.org/oecd/display.asp?CID=&LANG=EN&SF1=DI&ST1=5LMQCR2K9V7D>.

——2010a, *Innovative workplaces: making better use of skills within organisations*, OECD, Paris, viewed 20 January 2011, <http://dx.doi.org/9789264095687-en>.

——2010b, *The OECD innovation strategy getting a head start on tomorrow* OECD, Paris, viewed 7 February 2011, <http://www.oecd.org/document/15/0,3746,en_2649_34273_45154895_1_1_1_1,00.html#HTO>.

Pocock, B 2009, *Low-paid workers, changing patterns of work and life, and participation in vocational education and training: a discussion starter*, NCVER, Adelaide, viewed 13 March 2009, <http://www.ncver.edu.au/publications/2104.html>.

Pocock, B, Skinner, N, McMahon, C & Pritchard, S 2011, *Work, life and VET participation amongst lower-paid workers*, NCVER, Adelaide, viewed 14 July 2011, <http://www.ncver.edu.au/publications/2378.html>.

Polesel, J 2008, 'Democratising the curriculum or training the children of the poor: school-based vocational training in Australia', *Journal of Education Policy*, vol.23, no.6, pp.615—32.

Polesel, J & Volkoff, V 2009 'Vocational studies in schools — does it matter if I'm a girl and if I'm poor?' *Educational Practice and Theory*, vol.31, no.1.

Raffe, D 2008, 'The concept of transition system', *Journal of Education and Work*, vol.21, no.4, pp.277—96.

Robeyns, I 2005, 'The capability approach: a theoretical survey', *Journal of Human Development*, vol.6, no.1, pp.93—114.

Ryan, C & Sinning, M 2011, *Skill (mis)matches and over-education of younger workers*, NCVER, Adelaide, viewed 11 January 2011, <http://www.ncver.edu.au/publications/2330.html>.

Schmid, G & Schömann, K (eds). 2003, *The concept of transitional labour markets and some policy conclusions: the state of the art*, Berlin, TLM.NET working paper no.2003—01.

Schömann, K & O'Connell, PJ 2003, 'Education, training and employment dynamics: transitional labour markets in the European Union', eds G Schmid & K Schömann, *The concept of transitional labour markets and some policy conclusions: the state of the art*, Berlin, TLM.NET working paper no.2003—01.

Sen, A 1985, *Commodities and capabilities*, Elsevier, Amsterdam.

——1992, *Inequality re-examined*, Harvard University Press, Cambridge, MA.

——1999, *Development as freedom*, Anchor Books, New York.

——2000, *Social exclusion: concept, application and scrutiny*, Asian Development Bank, viewed 25 January 2011, <http://www.adb.org/documents/books/social_exclusion/Social_exclusion.pdf>.

Sherman, R 2006, *Down the track: TAFE outcomes for young people two years on*, NCVER, Adelaide, viewed 30 August 2009, <http://www.ncver.edu.au/students/publications/1694.html>.

Skills Australia 2009, *Background paper two: powering the workplace: realising Australia's skill potential*, Sydney, viewed 20 August 2011, <http://www.skillsaustralia.gov.au/PDFs_RTFs/WorforceFuturesBackgroundpapertwo1.pdf>.

——2010a, *Australian workforce futures: a national workforce development strategy*, Sydney, viewed 9 March 2010, <http://www.skillsaustralia.gov.au/PDFs_RTFs/WWF_strategy.pdf>.

——2010b, *Creating a future direction for Australian vocational education and training: a discussion paper on the future of the VET system*, Sydney, viewed 10 November 2010, <http://www.skillsaustralia.gov.au/PDFs_RTFs/discussionpaper-creatingnewdirectionforVET-hr.pdf>.

——2011, *Skills for prosperity: a roadmap for vocational education and training*, Sydney, viewed 10 May 2011, <http://www.skillsaustralia.gov.au/PDFs_RTFs/SkillsProsperityRoadmap.pdf>.

Stanwick, J 2006, *Outcomes from higher-level vocational education and training qualifications*, NCVER, Adelaide, viewed 20 July 2009, <http://www.ncver.edu.au/publications/1702.html>.

Sweet, R 2011, *The mobile worker: concepts, issues, implications*, NCVER, Adelaide, viewed 18 April 2011, <http://www.ncver.edu.au/publications/2343.html>.

UNEVOC 2004, *UNESCO-UNEVOC International Meeting on Innovation and Excellence in TVET Teacher/ Trainer Education*, UNEVOC International Centre for Technical and Vocational Education and Training, Hangzhou, China, viewed 14 June 2010, <http://unesdoc.unesco.org/images/0014/001480/148003eo.pdf>.

Wheelahan, L 2010, 'Rethinking equity in tertiary education — why we need to think as one sector and not two', *VET research: leading and responding in turbulent times*, AVETRA 13th Annual Conference, Gold Coast, Qld, viewed 1 May 2010, <http://avetra.org.au/wp-content/uploads/2010/04/48.00-Leesa-Wheelahan.pdf>.

Wolf, A 2011, *Review of vocational education — the Wolf report*, Department for Education, England, London, viewed 17 June 2011, <https://www.education.gov.uk/publications/eOrderingDownload/The%20Wolf%20Report.pdf>.

Yu, S, Bretherton, T, Schutz, J & Buchanan, J 2012, *Understanding the nature of vocations today: exploring labour market pathways*, NCVER, Adelaide.

# Appendix: Pathways and fields: ABS Survey of Education and Training 2009

The following tables and the associated charts (figures 2–7) are derived from the 2009 ABS Survey of Education and Training. Standard errors and confidence intervals for the tables and charts were calculated using the jack-knife method of replicate weighting implemented in SAS.

**Table A1 Changing field between their first and second post-school qualification by pathway (%)**

| Pathway | Percentage of those changing fields | 95% confidence intervals for percentages | |
|---|---|---|---|
| VET to VET | 51.0 | 48.5 | 53.5 |
| VET to HE | 47.5 | 42.9 | 52.0 |
| HE to VET | 71.1 | 66.1 | 76.2 |
| HE to HE | 49.3 | 46.3 | 52.3 |
| **Total** | **52.1** | **50.6** | **53.7** |

Source: Survey of Education and Training, 2009, unpublished data.

**Table A2 Changing field between their first and second post-school qualification by first qualification field (%)**

| Field | Percentage of those changing fields | 95% confidence intervals for percentages | |
|---|---|---|---|
| Natural and physical sciences | 68.1 | 61.4 | 74.8 |
| Information technology | 60.6 | 51.6 | 69.6 |
| Engineering | 51.2 | 47.2 | 55.3 |
| Architecture and building | 51.5 | 42.9 | 60.1 |
| Agriculture and environment | 60.8 | 52.3 | 69.4 |
| Health | 41.6 | 36.1 | 47.1 |
| Education | 47.4 | 40.3 | 54.5 |
| Management and commerce | 38.2 | 34.8 | 41.7 |
| Society and culture | 52.6 | 48.4 | 56.7 |
| Creative arts | 62.2 | 55.0 | 69.4 |
| Food and hospitality | 78.8 | 72.3 | 85.2 |
| **Total** | **52.1** | **50.6** | **53.7** |

Source: Survey of Education and Training, 2009, unpublished data.

**Table A3 First qualification is VET and second qualification is VET, by field of education (%)**

| First qualification field | Second qualification field | % in second qualification field | 95% confidence intervals for percentages | |
|---|---|---|---|---|
| Natural and physical sciences | Management and commerce | 29.6 | 10.6 | 48.6 |
| | Natural and physical sciences | 26.8 | 8.1 | 45.5 |
| Information technology | Information technology | 46.7 | 34.0 | 59.4 |
| | Management and commerce | 21.9 | 10.2 | 33.6 |
| Engineering | Engineering | 55.7 | 51.1 | 60.3 |
| | Management and commerce | 16.5 | 12.4 | 20.6 |
| Architecture and building | Architecture and building | 47.4 | 38.1 | 56.8 |
| | Management and commerce | 21.6 | 14.0 | 29.3 |
| Agriculture and environment | Agriculture and environment | 42.0 | 28.4 | 55.6 |
| | Management and commerce | 21.1 | 11.9 | 30.3 |
| Health | Health | 36.1 | 26.1 | 46.1 |
| | Society and culture | 21.6 | 13.3 | 30.0 |
| Education | Society and culture | 27.7 | 12.7 | 42.7 |
| | Education | 25.2 | 14.0 | 36.4 |
| Management and commerce | Management and commerce | 58.5 | 54.1 | 62.8 |
| | Society and culture | 13.6 | 10.3 | 16.8 |
| Society and culture | Society and culture | 55.0 | 46.8 | 63.3 |
| | Management and commerce | 17.0 | 10.8 | 23.3 |
| Creative arts | Creative arts | 50.6 | 39.0 | 62.1 |
| | Management and commerce | 18.0 | 10.1 | 26.0 |
| Food and hospitality | Management and commerce | 39.8 | 30.4 | 49.2 |
| | Food and hospitality | 26.0 | 18.2 | 33.8 |

Source: Survey of Education and Training, 2009, unpublished data.

**Table A4 First qualification is VET and second qualification is higher education by field of education (%)**

| First qualification field | Second qualification field | % studying in second qualification field | 95% confidence intervals for percentages | |
|---|---|---|---|---|
| Natural and physical sciences | Natural and physical sciences | 63.0 | 32.1 | 94.0 |
| | Health | 13.9 | 0.0 | 34.2 |
| Information technology | Information technology | 40.1 | 12.5 | 67.7 |
| | Management and commerce | 19.6 | 0.0 | 39.7 |
| Engineering | Engineering | 36.9 | 24.2 | 49.6 |
| | Management and commerce | 18.3 | 9.1 | 27.5 |
| Architecture and building | Architecture and building | 41.6 | 11.0 | 72.2 |
| | Society and culture | 15.9 | 0.0 | 35.5 |
| Agriculture and environment | Agriculture and environment | 23.9 | 1.1 | 46.6 |
| | Management and commerce | 25.8 | 0.0 | 52.7 |
| Health | Health | 77.6 | 69.6 | 85.5 |
| | Society and culture | 8.4 | 3.1 | 13.8 |
| Education | Education | 67.6 | 57.4 | 77.8 |
| | Society and culture | 20.2 | 11.3 | 29.1 |
| Management and commerce | Management and commerce | 58.9 | 50.8 | 67.1 |
| | Society and culture | 14.8 | 9.0 | 20.5 |
| Society and culture | Education | 27.9 | 15.9 | 39.9 |
| | Society and culture | 39.7 | 27.1 | 52.4 |
| Creative arts | Education | 18.7 | 4.7 | 32.6 |
| | Creative arts | 52.4 | 32.3 | 72.5 |
| Food and hospitality | Management and commerce | 24.4 | 9.0 | 39.8 |
| | Society and culture | 23.7 | 7.3 | 40.1 |

Source: Survey of Education and Training, 2009, unpublished data.

**Table A5 First qualification is higher education and second qualification is VET by field of education (%)**

| First qualification field | Second qualification field | % studying in second qualification field | 95% confidence intervals for percentages | |
|---|---|---|---|---|
| Natural and physical sciences | Management and commerce | 31.3 | 13.0 | 49.7 |
| | Society and culture | 15.3 | 0.6 | 30.0 |
| Information technology | Management and commerce | 50.0 | 8.2 | 91.9 |
| | Education | 16.7 | 0.0 | 42.2 |
| Engineering | Management and commerce | 48.4 | 27.3 | 69.4 |
| | Engineering | 24.5 | 5.6 | 43.4 |
| Architecture and building | Architecture and building | 29.8 | 0.0 | 95.4 |
| | Creative arts | 23.7 | 0.0 | 77.4 |
| Agriculture and environment | Management and commerce | 50.2 | 2.4 | 97.9 |
| | Agriculture and environment | 39.3 | 0.0 | 87.0 |
| Health | Health | 31.2 | 16.1 | 46.2 |
| | Management and commerce | 23.6 | 9.7 | 37.5 |
| Education | Management and commerce | 37.1 | 13.9 | 60.4 |
| | Society and culture | 30.2 | 11.1 | 49.3 |
| Management and commerce | Management and commerce | 62.3 | 47.1 | 77.6 |
| | Engineering | 8.3 | 0.0 | 17.1 |
| Society and culture | Management and commerce | 37.0 | 23.6 | 50.4 |
| | Society and culture | 29.8 | 18.5 | 41.2 |
| Creative arts | Management and commerce | 34.8 | 14.7 | 54.9 |
| | Engineering | 15.1 | 0.4 | 29.7 |
| Food and hospitality | Management and commerce | 71.6 | 0.0 | 100.0 |
| | Food and hospitality | 28.4 | 0.0 | 100.0 |

Source: Survey of Education and Training, 2009, unpublished data.

**Table A6 First qualification is higher education and second qualification is higher education by field of education (%)**

| First qualification field | Second qualification field | % studying in second qualification field | 95% confidence intervals for percentages | |
|---|---|---|---|---|
| Natural and physical sciences | Natural and physical sciences | 34.9 | 26.9 | 43.0 |
| | Health | 18.3 | 13.0 | 23.6 |
| Information technology | Information technology | 43.8 | 22.6 | 65.1 |
| | Management and commerce | 33.7 | 18.3 | 49.1 |
| Engineering | Engineering | 37.6 | 26.2 | 49.0 |
| | Management and commerce | 34.0 | 26.2 | 49.0 |
| Architecture and building | Architecture and building | 61.7 | 29.0 | 94.4 |
| | Society and culture | 17.0 | 0.0 | 41.3 |
| Agriculture and environment | Agriculture and environment | 41.3 | 23.5 | 59.1 |
| | Health | 19.2 | 2.9 | 35.5 |
| Health | Health | 67.6 | 58.7 | 76.5 |
| | Education | 11.6 | 6.1 | 17.0 |
| Education | Education | 60.6 | 50.6 | 70.6 |
| | Society and culture | 16.1 | 9.2 | 23.1 |
| Management and commerce | Management and commerce | 77.3 | 71.0 | 83.5 |
| | Society and culture | 9.2 | 5.0 | 13.3 |
| Society and culture | Society and culture | 48.0 | 42.2 | 53.9 |
| | Education | 24.6 | 19.7 | 29.5 |
| Creative arts | Education | 34.4 | 24.2 | 44.5 |
| | Society and culture | 23.1 | 0.0 | 11.5 |
| Food and hospitality | Education | 92.6 | 0.0 | 100.0 |
| | Management and commerce | 7.4 | 0.0 | 100.0 |

Source: Survey of Education and Training, 2009, unpublished data.

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**National Centre for Vocational Education Research Ltd**
Level 11, 33 King William Street, Adelaide, South Australia
PO Box 8288, Station Arcade, SA 5000 Australia
Telephone +61 8 8230 8400 Facsimile +61 8 8212 3436
Website www.ncver.edu.au Email ncver@ncver.edu.au