

NATIONAL VOCATIONAL EDUCATION
AND TRAINING RESEARCH PROGRAM

RESEARCH REPORT

Vocational education's variable links to vocations

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About the research

Vocational education's variable links to vocations

Gavin Moodie, RMIT, and Nick Fredman, Emmaline Bexley and Leesa Wheelahan, University of Melbourne

This report is part of a wider three-year program of research, *Vocations: the link between post-compulsory education and the labour market*, which is investigating the educational and occupational paths that people take and determining how their study relates to their work. Previously the authors theorised that vocational streams, whereby people study for a field of practice rather than a specific job, could support occupational progression; for example, a 'care' vocation could include workers within aged care, mental health, child care and disability care.

This report looks specifically at mid-level qualifications, such as diplomas, advanced diplomas and associate degrees, and how they assist entry to and progression in the labour market. In order to explore these issues, the authors analyse data from the Student Outcomes Survey and the Survey of Education and Work. In addition, they undertake case studies of mid-level qualifications in engineering and finance and also examine the roles of physician assistants in health, and veterinary technologists in agriculture, to see how mid-level qualifications can be strengthened.

Key messages

At a time when the vocational education and training (VET) sector is designing entitlement models and introducing contestability to improve the outcomes of learning, this report identifies a number of key issues.

- Generally, there is a weak link between education and work for students in most mid-level qualifications and fields of education. The exceptions are in occupations where there are licensing requirements or strong regulations.
- Employment outcomes for graduates improve as the level of study increases from certificate I to certificate III. However, only 37% of graduates obtain employment in their field of education, although this result does differ by field.
- Mid-level qualifications have three main roles, either as a labour market qualification (entry or upgrade), a transition to a higher-level qualification, or to widen access to higher-level qualifications.
- Training institutions could play a vital role in constructing and offering qualifications differently to suit the purpose they serve.
- Improving outcomes requires encouraging industry bodies and intermediaries to focus on improving the relationship between work and education.

Rod Camm
Managing Director, NCVET

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Executive summary

This report and the accompanying support document are part of a three-year project entitled *Vocations: the link between post-compulsory education and the labour market*. The investigation is being conducted in three strands over three stages. This report considers the roles that tertiary education qualifications, in particular mid-level qualifications, play in assisting their graduates to gain entry to and progression in work and how they may be strengthened. Statistical data from the 2011 Student Outcomes Survey, conducted by the National Centre for Vocational Education Research (NCVER), and the Australian Bureau of Statistics (ABS) Surveys of Education and Work from 1998 to 2012 are used in this investigation. The report explores how the role of qualifications may be strengthened by examining four cases in which tertiary institutions have introduced new qualifications to meet a new or emerging work role.

The study found that graduates of vocational certificates III and above had similar employment rates after training – of over 80% – which were markedly higher than the employment rate for certificate II graduates (67%), which in turn was markedly higher than the rate for certificate I graduates (58%). However, these differed substantially by field of education. In engineering and related technologies and in veterinary studies, certificates III and IV graduates had higher employment rates than graduates of diplomas and above. In nursing, diploma graduates (91%) had a higher employment rate than graduates of certificates III (87%) and IV (86%), reflecting the new requirement of a diploma for registration as an enrolled nurse (see the support document accompanying this report). In banking and finance, graduates of diplomas and above had a modest employment rate of 69%. This may reflect students' use of the diploma as a path to higher education qualifications, which employers use as entrance screening for higher-level work in finance fields (Yu, Bretherton & Schutz 2012, p.22).

We also note from the Student Outcomes Survey that, for all fields, only 29% of graduates of certificate III proceeded to further study, presumably reflecting the strong employment focus of apprenticeships and traineeships, which are offered at certificate III. For all other qualifications, relatively similar proportions, of around 33%, proceeded to further study. Again, these outcomes differed significantly by field. The proportions of graduates of all levels proceeding to further study were relatively high in creative arts (48%), information technology (47%) and banking and finance (43%) and relatively low in agriculture (23%), and process and resources engineering (22%).

For all fields, at all levels of qualification, only 37% of vocational education and training (VET) graduates were employed in the same field as their qualification. This also differs by level of qualification, with the proportion of certificate III graduates employed in the same field (55%) being more than double that of graduates of diplomas and above (26%). The proportion of VET graduates working in the same field as their qualification varies even more by field of education, with the proportion for nursing (72%) and electrical and electronic engineering and technology (64%) being two to three times that for creative arts (10%) and information technology (25%). In many fields the proportion of graduates working in the same field differs significantly by qualification level. For example, in electrical and electronic engineering and technology, 84% of certificate III, but only 30% of diploma and above, graduates worked in the same field, whereas in agriculture only 34% of certificate III, but 52% of diploma and above, graduates worked in the same field as their qualification.

Lastly, from the Student Outcomes Survey, we examine the proportion of vocational graduates who were employed six months after training and who were working at a higher skill level than before training. Again, there was considerable variation by qualification level within field. For example, in

nursing, 47% of certificate IV graduates and 41% of diploma graduates worked at a higher level after training than before training, but the proportion for certificate III graduates was only 11% (with a relative standard error of more than 50%). In contrast, in society and culture, 21% of certificate III graduates were working at a higher level, but only 14% of certificate IV and 16% of graduates of diplomas and above were. As would be expected, a higher proportion of graduates working in the same occupation as their qualification were working at a higher skill level (25%) after training than those who were employed in a different occupation (13%).

We extend our investigation of the role of tertiary education qualifications in assisting their graduates to gain entry to and progression in work by examining the ABS Survey of Education and Work from 1998 to 2012. These data do not provide strong evidence that people whose highest qualification is a bachelor degree are being employed at lower-level occupations; nor do they provide strong evidence that people whose highest qualification is a bachelor are displacing people whose highest qualification is a diploma or advanced diploma from employment in management, professional or lower-level occupations. Although the ABS changed the classification of occupations used to report results from the Survey of Education and Work in 2007, it seems that the proportion of diploma and advanced diploma graduates employed as managers or professionals has fallen since 2010 and the proportion of bachelor graduates employed in these occupations fell from 2011 to 2012. But these changes are within the bounds of historical variations and have subsequently recovered. From this we conclude that bachelor graduates may be displacing diploma graduates in the workforce, but data from future Surveys of Education and Work will be needed to confirm this.

We consider how the role of tertiary education qualifications in assisting their graduates to gain entry to and progression in work may be strengthened by examining the development of mid-level qualifications in engineering and finance, as well as for physician assistants (health) and veterinary technologists (agriculture). The minerals industry national associate degree is sponsored by the Minerals Council of Australia, with support from the Australian Government and in collaboration with tertiary education institutions. It was developed by the Minerals Tertiary Education Council, established in 1998 by the Minerals Council of Australia, following a review in which problems in both tertiary education and industry were identified.

While the *Financial Services Reform Act 2001* requires a diploma for those providing independent financial advice, since 2007 the Financial Planners Association has required a bachelor degree for membership. This has effectively set the requirement for entry to practice and is undermining the viability of the Diploma in Financial Services (Financial Planning). It is now less possible for people to enter financial services at a modest level and work their way up the profession.

The programs for physician assistants and veterinary technologists are examples of educational institutions taking the initiative in establishing programs that prepare graduates for the paraprofessions. They have achieved only modest success so far, largely because of trenchant opposition from competing professionals. The case studies for physician assistants and veterinary technologists suggest three conditions by which educational institutions could introduce mid-level qualifications that will be accepted:

- Identify a role in the workforce.
- Convince employers of the benefits of the new role.
- Understand workforce structure and dynamics.

The report concludes that there is limited scope for tertiary education institutions alone to foster links between qualifications and work. Tertiary education institutions are mostly limited to following rather than initiating structural change in the workforce. New qualifications can play an important role in building links between lower- and higher-level qualifications and in professionalising and upgrading the skills of particular industries, but this is most effective when it is done collaboratively by the education and industry social partners – employers, unions and government.

Introduction

What roles do tertiary education qualifications play in assisting their graduates to gain entry to and progression in work and how may these roles be strengthened?

These questions were asked as part of a project entitled *Vocations: the link between post-compulsory education and the labour market*. The project is investigating the potential to improve pathways and flows within and between education and work. The project's duration is three years and consists of three interrelated strands:

- Strand 1: entry to vocations, concentrating on VET in Schools as a pathway to work or further study
- Strand 2: the role of educational institutions in fostering vocations, concentrating on VET and higher education institutions
- Strand 3: understanding the nature of vocations in work today and their potential improvement.

Each strand is concentrating on four industries: agriculture, engineering, finance and health.

A working paper and a report produced in the first year of the work in strand two investigate the role of educational institutions in fostering vocations (Moodie 2012; Wheelahan et al. 2012). In the discussion paper arising out of the first year of the project, the team (Wheelahan, Moodie & Buchanan 2012, p.30) noted that there has been a 'hollowing-out' of the middle of the skill distribution, while those at the high and low ends have increased (Cully 2003). The team further noted Curtain's (2003, p.1) claim that there has not been sufficient policy attention to intermediate skills and the adequacy of skills formation for intermediate skills. This work seeks to begin to address that lack of attention by examining mid-level qualifications in Australia.

The project examined this issue by reviewing statistical data from NCVER's 2011 Student Outcomes Survey and from the ABS Surveys of Education and Work, from 1998 to 2012. By investigating four cases in which tertiary institutions had introduced new qualifications to meet a new or emerging work role, the project explored how the role of qualifications might be strengthened.

The Australian Qualifications Framework (AQF) divides qualifications into ten levels (table 1). Almost all qualifications at level 7 (bachelor) and above are accredited only as higher education qualifications, while almost all qualifications at level 4 (certificate IV) and below are accredited only as vocational qualifications. Associate degrees at level 6 are only higher education, while advanced diplomas also at level 6 and diplomas at level 5 may be accredited as vocational or higher education qualifications.

Table 1 Australian Qualifications Framework, 2013

Level	Qualification	Notional duration of student learning (years)
10	Doctoral degree	3–5
9	Master's degree (extended)	3–4
	Master's degree (coursework)	1–2
	Master's degree (research)	1–2
8	Graduate diploma	1–2
	Graduate certificate	0.5–1
	Bachelor honours degree	1
7	Bachelor degree	3–4
6	Associate degree	2
	Advanced diploma	1.5–2
5	Diploma	1–2
4	Certificate IV	0.5–2
3	Certificate III	1–2
2	Certificate II	0.5–1
1	Certificate I	0.5–1
	Senior secondary certificate of education	2

Source: Adapted from Australian Qualifications Framework Council (2011, pp.7–10; 2012).

The team identified as mid-level qualifications diplomas at AQF level 5 and advanced diplomas and associate degrees at AQF 6. However, because the study is considering the role of qualifications in the workforce, its organising concepts are those of the workforce, not educational qualifications and structures. The study so far has found no general direct relation between work and education, meaning that different qualifications have different and often broad roles in different industries. A role that is served by a qualification at one level in a particular field is served by a qualification at another level in a different field. The blurring of the boundary between vocational and higher education seems to reflect changes in the construction of work and occupations. Industries are changing in different ways at different speeds, having started from different points. This introduces an unavoidable breadth and perhaps an imprecision to the identification of mid-level qualifications. It was therefore necessary to investigate a range of qualifications to observe changes over time.

In a previous technical paper (Moodie & Fredman 2013) we examined whether mid-level qualifications are losing their share of student load to qualifications at other levels, particularly baccalaureates. We examined student load from 2002 to 2011 in AQF 4 (certificates IV), AQF 5 (diplomas), AQF 6 (advanced diplomas and associate degrees) and AQF 7 (bachelor's degree). The key results for the purposes of this report are set out in table 2. The first column shows each qualification's share of student load in the qualifications in 2011 – how important each qualification was in 2011. Column two shows the percentage change in each qualification's student load from 2002 to 2011 – how much their current importance was the result of changes over the last decade. The third column shows by how much each qualification changed its share of student load in the qualifications from 2002 to 2011.

We note that, while bachelors had a high 58.5% share of the load of all mid-level qualifications in 2011 and that bachelors' student load had increased by 34% from 2002 to 2011, bachelors' share of mid-level student load fell by 4.5% from 2002 to 2011. Vocational diplomas and advanced diplomas

together were 13.6% of student load in 2011, their combined load increased by 49% from 2002 to 2011 and their share of the qualifications' load increased marginally by 0.4% from 2002 to 2011. Higher education sub-degree qualifications, which include higher education diplomas and associate degrees, increased their share of the load by 1.4%. The biggest increase in share of the qualifications' student load was in certificates IV, which increased their share by 2.4% from 2002 to 2011 (table 2).

Table 2 Changes in qualifications' share of student load, 2002–11, %

Qualification	Share of student load in 2011	Change in student load 2002–11	Change in share of student load 2002–11
Certificate IV	11.7	83	2.4
VET diploma	11.3	68	1.6
VET advanced diploma	2.4	-4	-1.2
Sub total VET diplomas	13.6	49	0.4
HE sub degree	2.5	207	1.4
Bachelor degree	58.5	34	-4.5

Source: Moodie & Fredman (2013, table 4).

From 2010 the Australian Government phased in demand-driven enrolments in baccalaureates in public universities by allowing universities to enrol as many bachelor students as they wished, except in medicine. In 2010 and 2011 the government provided full funding for enrolments up to 10% above universities' target, and for any additional student it allowed universities to retain student tuition fees but did not pay them the public subsidy. The demand-driven system was introduced fully in 2012, when universities received full funding for as many baccalaureate students they enrolled, again with the exception of medicine. While universities increased their enrolments in baccalaureates substantially from 2010, this did not reverse baccalaureates' falling share of the qualifications considered. A fuller report and analysis is published in Moodie and Fredman (2013).

Qualifications have different values, functions and roles, often concurrently. Keating (2008, p.7) observed that 'all qualifications carry value – for the graduates and for the users':

The intrinsic value is the personal benefit and status that a qualification gives to the learner, the platform and motivation it gives for further learning, and the wider social value of an educated citizenry. The exchange value is realised in the employment market and in access to further formal learning. Both intrinsic and exchange value need to have a base in knowledge.

Gallacher (2011) considered the functions of higher national certificates and higher national diplomas in Scotland. Higher national certificates are roughly equivalent to the first year of a bachelor degree and higher national diplomas are roughly equivalent to the first two years of a bachelor degree. They are therefore similar to what we have identified as mid-level qualifications. Gallacher posited three functions of higher national certificates and higher national diplomas:

Occupational education and training

Most of these qualifications were initially developed to provide education and training for specified occupational areas, generally at technician, technologist and first line manager level, and a number of these qualifications continue to have this primary role ...

Transitional qualification for progression to degree programmes

For many HNC/Ds [higher national certificates/diplomas] their primary role is now as transitional qualifications, which are used by students to enable progression to undergraduate degrees ...

Widening access to higher education

Associated with the growing role of HNC/Ds as transitional qualification, it has been increasingly recognized that these programmes now have a key role in widening access through providing 'second chance' education for students from areas of social and economic deprivation.

(Gallacher 2011, pp.2–3)

Arguably, Australian mid-level qualifications, and indeed qualifications at most levels, may have these three roles:

- as a labour market qualification – entry or upgrade
- as a transition to a higher-level qualification
- for widened access to higher-level qualifications.

A qualification may serve these and indeed other roles concurrently. Some students may enrol in a certificate IV in information technology as a preparation for work in computer customer support or to upgrade from customer support to computer technician, using the certificate mainly as a labour market qualification. Other students may enrol in the same program, hoping to transfer to a diploma of information technology systems administration, and using the qualification mainly as a transition to a higher-level qualification. Yet other students may enrol in the certificate IV as part of a joint offer of admission to a bachelor of information technology offered by a university to widen access to its undergraduate degree. And some students may enrol in the certificate to equip them to operate their home computer system.

A qualification's main role is shaped by whether it has an employment or educational logic. The project's synthesis discussion paper (Wheelahan, Moodie & Buchanan 2012, p.21) noted Iannelli and Raffe's (2007) distinction between the employment logic of upper secondary student transitions systems and those with an educational logic. Systems with an employment logic have strong links between education and the labour market:

In countries with strong linkages, employers or trade unions have a larger role in the design, regular updating, delivery, and assessment of vocational programmes; there is frequent contact and communication between educational and labour-market institutions; and labour-market signals to the education system are strong and clear ... In countries where the *education logic* dominates, vocational upper-secondary education has weak links with employment, is less sharply differentiated from academic upper-secondary education, and has stronger links with tertiary education. It 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. (Iannelli & Raffe 2007, p.51, emphasis in original)

It is important to note that Iannelli and Raffe's systems logics describe mainly their orientation – for progression to work or to further education – and accordingly their deepest relations – to employers or to education institutions. As was emphasised in the project's strand two stage one report (Wheelahan et al. 2012, p.14), system logics should not be confused with curriculum. Many educational systems in northern continental Europe have an employment logic, but curriculum in vocational qualifications is broad and includes liberal components that prepare students for citizenship. In contrast, in Australia and England there is a strong educational logic underpinning vocational education, which nonetheless is 'functional, workplace focussed and task-oriented' (Guthrie 2009, p.17).

This paper applies Iannelli and Raffe's educational and employment logics to qualifications. The clearest illustrations are associate degrees, which are relatively new qualifications to Australia. They are also of particular salience to this project because they are arguably augmenting and perhaps displacing (advanced) diplomas as mid-level qualifications that prepare graduates for mid-level occupations. Associate degrees may also be displacing (advanced) diplomas as 'cross over' qualifications between vocational and higher education (Karmel & Nguyen 2003), that is, in fulfilling the second role as a transition to a higher-level qualification.

Some associate degrees such as the associate degrees in engineering, mining and geoscience described in the case study and RMIT's associate degrees in engineering technology (civil engineering), fashion design and technology, and legal practice (paralegal) have strong employment logics: they prepare graduates for specific and well-identified roles in the workplace, they are designed and offered in close collaboration with employers, and most have strong work-integrated learning. Possibly the Australian associate degree with the strongest employment logic is Charles Sturt University's associate degree in policing practice, which is the entry program for the NSW Police. While these qualifications have links with lower and higher educational programs, their strongest links are with work. Some, such as RMIT's associate degree in legal practice (paralegal), have relatively weak links with higher-level qualifications.

Other associate degrees have strong educational logics, for example, by being truncated baccalaureates. This is true of most associate degrees in the United States, which typically provide the general education and foundation provided in the first two years of four-year baccalaureates. A good Australian example is Deakin University's associate degree of arts, business and sciences, which 'provides flexible pathways into university and a guaranteed pathway into a range of Deakin degrees at the Warrnambool Campus or the Geelong Waurin Ponds Campus, or via off campus study. The Associate Degree may also be taken as a stand-alone, two year exit qualification' (Deakin University, no date).

The next chapter of this report describes the methods used in the report. The following chapter reports on the examination of the role of mid-level tertiary qualifications in assisting their graduates to gain entry to and progression in work by reviewing statistical data from NCVET's 2011 Student Outcomes Survey and from the ABS Surveys of Education and Work from 1998 to 2012. The subsequent chapter explores how the role of qualifications may be strengthened; this is done by examining four cases in which tertiary institutions had introduced new qualifications to meet a new or emerging work role; that is, with an employment logic.

We conclude by finding that mid-level qualifications have limited roles in providing entry to and progression in work outside those occupations strongly regulated by the state, such as the licensed trades and some health occupations and a few occupations that are strongly regulated by the industry, independent of the state, such as accounting.

The development of mid-level qualifications can be an important part of professionalising occupations within industries, or supporting the emergence of new occupations and roles at mid-level. However, unless this is led and supported by social partners such as employers, unions and government (particularly as a large employer in many industries), then it is difficult for the qualification to become established and fulfil a role as a labour market qualification which supports entry or upgrade. Mid-level qualifications need to be relevant and realise occupational outcomes if they are to support both educational and occupational progression.

There is therefore limited scope for tertiary education institutions alone to foster progression in vocations by initiating mid-level qualifications. Tertiary education institutions are mostly limited to following rather than initiating structural change in the workforce. However, they can play an important role in supporting structural change, if this is being led by the social partners.

A profession seeking to emerge as a clearly defined professional field of practice, with boundaries that distinguish it from other professions (as will be seen to be the case with the finance industry), can opt to specify requirements for higher-level qualifications. In areas where the relation between education and employment is very loose and where there are not yet well-established social partners to support the emergence of the profession and regulate entry requirement and membership conditions, it may well be the case that mid-level qualifications will emphasise transition to higher-level studies and widen access to higher-level qualifications. Such qualifications will still be relevant as a labour market entry qualification, but this will not be its primary purpose. It is quite likely that such qualifications will, under these circumstances, serve as a 'signal' to employers about the capacities and potential of applicants, rather than being direct preparation for work.

Because qualifications serve different functions and because they have variable roles in providing entry to and progression in work, policy and funding regimes should not expect all mid-level qualifications to play all roles equally, but should support the differentiated purposes of these qualifications.

The concluding chapter of this report revisits the notion of vocational streams, which we introduced in the first year of this project, and considers whether vocational streams could be relevant and help to support tighter links between education and work in the light of the analysis in this report.

Methods

The team's initial task was to identify and indeed to find an agreed term for 'middle level', 'intermediate' or 'paraprofessional' qualifications. The team began by identifying the gap in the skills distribution reportedly being hollowed out, as that between skilled and professional occupations, usually known as paraprofessional occupations. The qualifications normally utilised by paraprofessionals are diplomas, which are at the AQF level 5, and advanced diplomas and associate degrees, at AQF 6. The team agreed with NCVER to use the term 'mid-level' to refer to qualifications that prepare graduates for the paraprofessions. The team's two key research questions were:

- What are the roles of tertiary education qualifications in assisting their graduates to gain entry to and progression in work?
- How may they be strengthened?

The team investigated the link between mid-level qualifications and work by examining two established statistical surveys, NCVER's Student Outcomes Survey in 2011 and the ABS Survey of Education and Work, from 1998 to 2012. A confidentialised unit record file of the 2011 student outcomes data was obtained from NCVER and analysed in SAS. For each broad field of education and for each narrow field of education used as case studies the team calculated the proportion of graduates with qualifications at each level who at the time of the survey were employed, were working in the same occupation as their training, were working at a higher skill level than before training, and were in further study.

ABS reports of its Survey of Education and Work from 1998 to 2012 were downloaded from its website and analysed in Microsoft Excel. Over this period, minor changes occurred in the way qualifications were reported, which are unlikely to have affected materially the results reported here. However, in 2007 the ABS changed the classification of occupations used to report results from the Survey of Education and Work. Nonetheless, it was considered appropriate for the limited purposes of this study to map the highest occupational level from 1998 to 2006, called 'managers and administrators', to the highest occupational level from 2007 to 2012, called 'managers', and to associate the second highest occupational levels, which were called 'professional' from 1998 to 2006 and again from 2007 to 2012. The report considers only broad historical trends in these data.

For the case studies the team reviewed developments in each of the four industries on which the project is concentrating: agriculture, engineering, finance and health. The team sought programs in each industry with an employment logic but which had been initiated or developed by an educational institution. The team was able to identify only a few qualifications that met these conditions, and these were studied.

Some of the cases are clearly of mid-level qualifications, such as the first case of associate degrees in engineering, mining and geoscience and the second study of the transition of the financial planning qualification. The third study is of physician assistants. Physician assistants were developed as 'assistants with special training, intermediate between that of the technician and that of the doctor' and theirs is clearly a paraprofessional role. However, reflecting the variable relation between work and qualifications (and the contingencies of current higher education funding rules), physicians' assistants undertook a master of physician assistant studies, which is not a mid-level qualification. The fourth study in agriculture is of veterinary technologists. The role of veterinary technologist is relatively new in Australia and sits between veterinary nurses and veterinary practitioners. This is also

clearly a paraprofessional role. But again reflecting the variable relation between work and education, veterinary technologists undertake a bachelor of applied science (veterinary technology extended major), which would not normally be identified as a mid-level qualification.

The case studies are descriptive and are used to illustrate some of the issues and potential for educational institutions developing qualifications with an employment logic. Detailed explanations of who was consulted in each industry case study and the methods used to prepare each case study are included in the support document attached to this report.

Employment, study and skills outcomes of mid-level qualifications

2011 Student Outcomes Survey

We first examine data from the NCVER's 2011 Student Outcomes Survey. It surveys VET graduates who completed their study in 2010 and asks about their activity in 2011, six months after they completed their study. Table 3 shows the proportion of graduates employed after training by level of qualification, broad field of education and narrow field of education for the narrow fields of particular interest to this study. We note that, for all fields, graduates of certificates III, certificates IV and diplomas and above had similar employment rates after training, ranging from 80.8% to 83.4%. This was markedly higher than the employment rate for certificate II graduates (66.9%), which in turn was higher than the rate for certificate I graduates (57.6%).

However, this differed substantially by field of education. In engineering and related technologies and in veterinary studies, certificates III and IV graduates had higher employment rates than graduates of diplomas and above. In nursing, diploma graduates (91.0%) had a higher employment rate than graduates of certificates III (86.8%) and IV (86.0%), reflecting the new requirement of a diploma for registration as an enrolled nurse (see support document). In banking and finance, graduates of diplomas and above had a modest employment rate of 68.6%, which may reflect students' use of the diploma as a path to higher education qualifications and which employers use as entrance screening for higher-level work within finance fields (Yu, Bretherton & Schutz 2012, p.22).

Table 4 shows the proportion of graduates in further study after training by level of qualification, broad field of education and narrow field of education for the narrow fields of particular interest to this study. We note that, for all fields, only 29.0% of graduates of certificate III proceeded to further study, presumably reflecting the strong employment focus of apprenticeships and traineeships, which are offered at certificate III. For all other qualifications, relatively similar proportions proceeded to further study, ranging from 32.9% to 36.3%. Again, these outcomes differed markedly by field. The proportions of graduates of all levels proceeding to further study were relatively high in creative arts (48.2%), information technology (46.6%) and banking and finance (43.2%), and relatively low in process and resources engineering (22.0%) and agriculture (23.4%).

Table 3 Percentage of graduates in employment six months after training, by level of qualification and broad and selected narrow field of education, 2011

Field of education	Cert. I	Cert. II	Cert. III	Cert. IV	Diplomas & above	All levels
Natural and physical sciences	–	65.9**	64.7	59.6	61.4	62.2
Information technology	–	47.8	48.4	58.2	63.1	56.1
Engineering and related technologies	62.7	74.4	90.8	94.6	83.0	85.6
Process and resources engineering	86.6	85.5	90.7	95.9	87.7	89.7
Electrical and electronic engineering and technology	36.9**	78.4	93.8	96.1	76.9	88.6
Architecture and building	76.2	75.6	93.4	88.3	83.9	86.3
Agriculture, environmental and related studies	53.6	74.5	87.4	90.1	92.3	82.8
Agriculture	41.4*	77.3	91.0	91.1	94.2	85.4
Health	42.1	79.7	83.2	87.7	91.0	84.3
Nursing	–	12.4**	86.8	86.0	91.0	88.4
Veterinary studies	43.5	62.3	80.4	87.6	78.0**	71.6
Education	43.7	100.0**	78.0	91.2	98.2	89.9
Management and commerce	55.2	61.9	75.8	83.7	85.7	76.3
Banking and finance	100.0**	42.8*	72.7	72.9	68.6	70.8
Society and culture	53.4	55.9	77.0	83.0	83.7	77.6
Creative arts	36.5	53.7	53.4	60.3	68.2	60.1
Food, hospitality and personal services	55.8	67.7	77.5	85.8	71.8	73.3
All fields	57.6	66.9	80.8	83.1	83.4	77.4

Notes Blank cells indicate a zero sample size.

* Relative standard error > 25%. ** Relative standard error > 50% or cell sample size <10.

Source NCVET (2011).

Table 4 Percentage of graduates in further study six months after training, by level of qualification and broad and selected narrow field of education, 2011

Field of education	Cert. I	Cert. II	Cert. III	Cert. IV	Diplomas & above	All levels
Natural and physical sciences	–	22.6**	29.8	40.1	37.7	35.2
Information technology	–	28.1**	52.4	44.4	44.4	46.6
Engineering and related technologies	34.3	32.1	19.6	22.4	41.9	24.9
Process and resources engineering	17.1**	22.4	20.8	20.5	47.6*	22.0
Electrical and electronic engineering and technology	100.0**	45.7	26.1	28.6	42.0	32.9
Architecture and building	25.5	35.2	21.4	27.9	33.7	26.2
Agriculture, environmental and related studies	34.2	29.6	22.3	21.9	22.9	25.1
Agriculture	49.4	29.7	20.1	18.3	15.2	23.4
Health	46.5	25.5	29.7	37.9	34.1	31.0
Nursing	–	45.4**	20.1**	37.7	32.6	33.8
Veterinary studies	48.1	53.4	37.8	16.6*	23.1**	40.9
Education	33.1*	0	26.7	27.0	32.7	27.3
Management and commerce	28.5	43.1	36.3	30.1	33.6	35.4
Banking and finance	100.0**	44.6**	42.9	46.0	41.4	43.2
Society and culture	23.5	43.6	36.1	38.1	31.7	36.2
Creative arts	44.3	49.1	49.2	57.6	39.4	48.2
Food, hospitality and personal services	28.1	35.0	26.3	26.5	25.8	30.2
All fields	33.2	36.3	29.0	32.9	34.2	32.4

Notes Blank cells indicate a zero sample size.

* Relative standard error > 25%. ** Relative standard error > 50% or cell sample size <10.

Source NCVET (2011).

Next we consider the proportion of VET graduates who were employed in the same field as their qualification six months after completing their qualification, shown in table 5. For all fields, at all levels of qualification, only 37.2% of VET graduates were employed in the same field as their qualification. This differs by level of qualification, with the proportion of certificate III graduates employed in the same field (54.6%) being more than double that of graduates of diplomas and above (25.5%). The proportion of VET graduates working in the same field as their qualification varies even more by field of education, with the proportion for nursing (72.3%) and electrical and electronic engineering and technology (64.1%) graduates of all levels being two to three times that for creative arts (9.8%) and information technology (24.7%) and other fields. Within many fields the proportion of graduates working in the same field differs significantly by qualification level. For example, in electrical and electronic engineering and technology, 83.7% of certificate III but only 30.0% of diploma and above graduates worked in the same field, whereas in agriculture only 34.2% of certificate III but 51.7% of diploma and above graduates worked in the same field as their qualification.

Table 5 Percentage of those employed six months after training working in the same occupation as their training, by level of qualification and broad and selected narrow field of education, 2011

Field of education	Cert. I	Cert. II	Cert. III	Cert. IV	Diplomas & above	All levels
Natural and physical sciences	–	55.3**	38.2	49.3	56.6	46.3
Information technology	–	–	23.5	17.9	33.2	24.7
Engineering and related technologies	6.8*	13.0	66.3	39.1	35.1	49.1
Process and resources engineering	10.7**	37.8	43.6	15.2*	37.9**	36.5
Electrical and electronic engineering and technology	0	8.0*	83.7	55.5	30.0	64.1
Architecture and building	7.1*	7.7	76.0	27.4	26.9	50.9
Agriculture, environmental and related studies	26.1**	20.4	34.5	35.4	37.3	30.2
Agriculture	43.6**	28.9	34.2	31.9	51.7	34.4
Health	6.1**	6.2	39.9	45.7	58.9	34.4
Nursing	–	–	8.4**	70.0	78.1	72.3
Veterinary studies	6.1**	36.2	42.2	88.8	35.7**	52.0
Education	–	–	64.5	31.8	56.6	35.2
Management and commerce	8.4*	26.8	32.0	23.3	17.9	24.8
Banking and finance	0	0	33.7	39.8	22.4	31.1
Society and culture	–	25.9	63.1	35.4	19.4	45.4
Creative arts	0	11.9*	9.1	9.0*	10.9	9.8
Food, hospitality and personal services	21.1*	20.8	58.0	37.7	2.7**	40.1
All fields	8.7	17.7	54.6	31.1	25.5	37.2

Notes Sample base includes only those who had indicated an occupation after training.

Blank cells indicate a zero sample size.

* Relative standard error > 25%. ** Relative standard error > 50% or cell sample size <10.

Source NCVET (2011).

Finally from the Student Outcomes Survey, we examine the proportion of vocational graduates who were employed six months after training and who were working at a higher skill level than before training, shown in table 6. Again, there was considerable variation by qualification level within field. For example, in nursing, 47% of certificate IV graduates and 40.6% of diploma graduates worked at a higher level after training than before training, but the proportion for certificate III graduates was only 10.6% (with a relative standard error of more than 50%). In contrast, in society and culture, 20.9% of certificate III graduates were working at a higher level, but only 13.8% of certificate IV and 15.8% of graduates of diplomas and above were. As might be expected, a higher proportion of graduates

working in the same occupation as their qualification were working at a higher skill level (24.8%) than those who were employed in a different occupation (13.1%). (See table 16 in support document.)

Table 6 Percentage of those employed six months after training working at a higher skill level than before training, by level of qualification and broad and selected narrow field of education, 2011

Field of education	Cert. I	Cert. II	Cert. III	Cert. IV	Diplomas & above	All levels
Natural and physical sciences	–	0	26.3	31.5	25.7*	27.6
Information technology	–	0	25.7	16.5	29.6	22.8
Engineering and related technologies	13.0	17.8	24.5	9.6	20.0	20.5
Process and resources engineering	0.9**	8.4*	9.4	7.7**	10.0**	8.7
Electrical and electronic engineering and technology	52.6**	34.5	39.8	7.6*	26.0	33.4
Architecture and building	11.7	20.1	27.0	12.8	23.7	22.3
Agriculture, environmental and related studies	0	9.7	10.1	9.6*	10.2	9.8
Agriculture	0	8.2	6.7	11.7*	9.5*	8.0
Health	0	6.5	14.3	24.0	32.3	18.2
Nursing	–	–	10.6**	47.0	40.6	41.0
Veterinary studies	0	22.3	21.0*	32.7	0	24.3
Education	0	–	21.4	7.9	3.5**	8.5
Management and commerce	10.5*	17.3	23.2	12.0	11.9	15.8
Banking and finance	0	0	17.1	9.9	12.2	13.1
Society and culture	6.3**	11.5	20.9	13.8	15.8	17.1
Creative arts	0	20.5	15.6	10.2	25.3	18.4
Food, hospitality and personal services	14.5**	15.4	25.8	16.2	22.4	20.9
All fields	11.1	14.6	22.2	12.3	16.6	17.3

Notes Blank cells indicate a zero sample size.

* Relative standard error > 25%. ** Relative standard error > 50% or cell sample size <10.

Source NCVER (2011).

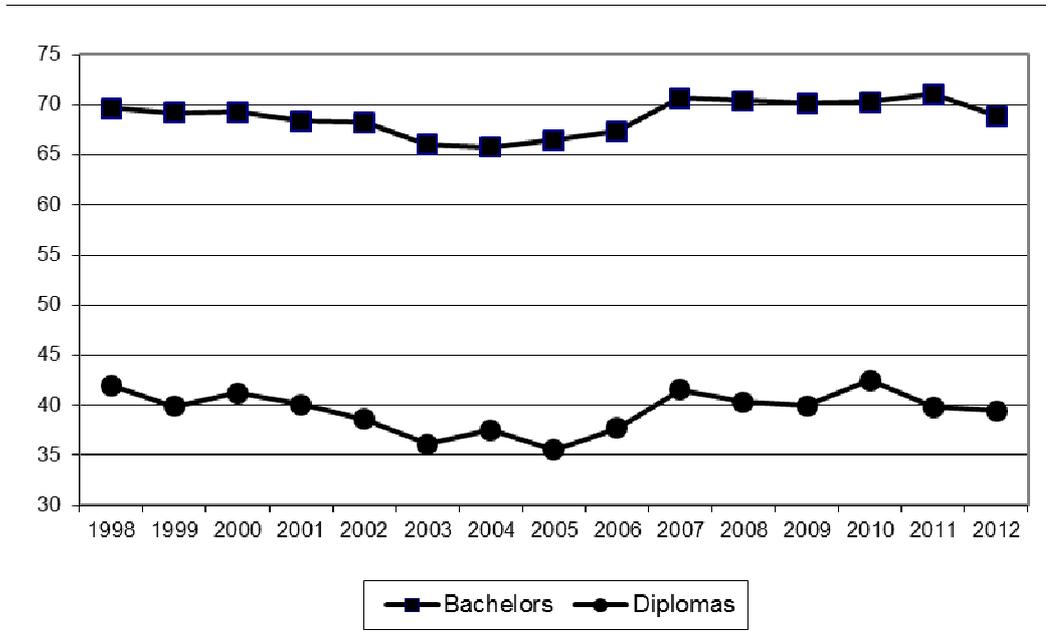
The relevant chapter in the support document contains additional tables and discussion, including tables showing the predicted probabilities of employment and further study after graduation, controlling for field, sex and previous employment status. The results suggest that qualifications at diploma and higher levels are, by comparison with other qualification levels, particularly useful for young people, both for accessing higher education and moving to more highly skilled work.

Survey of Education and Work 1998–2012

The ABS Survey of Education and Work reports, amongst other things, people's occupation by their highest level of qualification. This is analysed in some detail in the supporting document. In summary, these data do not provide strong evidence that people whose highest qualification is a bachelor degree are being employed at lower-level occupations. Neither do they provide strong evidence that people whose highest qualification is a bachelor degree are displacing people whose highest qualification is a diploma or advanced diploma in employment in management, professional or lower-level occupations. This may be because some people working in these occupations held a diploma and subsequently upgraded it to a bachelor degree. Figure 1 shows the proportions of people employed as managers or professionals whose highest qualification was a baccalaureate and people whose highest qualification was a diploma or advanced diploma, from 1998 to 2012. Many diplomas and advanced diplomas prepare graduates as paraprofessionals, so the modest proportions shown in figure 1 of people whose highest qualification is an (advanced) diploma and who are employed as managers or

professionals might be expected. It will be noted that the proportion of diploma and advanced diploma graduates employed as managers or professionals has fallen since 2010 and the proportion of bachelor graduates employed in the top two occupations fell from 2011 to 2012, but these changes are within historical trends. Bachelor graduates may be displacing diploma graduates in the workforce, but data from future Surveys of Education and Work will be needed to confirm this.

Figure 1 Percentage of people whose highest qualification was bachelor or whose highest qualification was a diploma or advanced diploma employed as managers or professionals, 1998–2012



Source: ABS (2012, table 11).

Conclusion

Previous reviews of enrolment data and this review of data from the NCVER’s Student Outcomes Survey and from the ABS Survey of Education and Work do not provide much evidence that bachelor degrees are displacing diplomas and advanced diplomas in enrolments, employment outcomes or levels of occupation. These have changed recently, but not all in the same direction and are within historical bands. Bachelors may be displacing diplomas and advanced diplomas, but future data will be needed to confirm this.

Indeed, few generalisations are evident from these data at the level of qualification. Certificates I and to some extent certificates II have different roles from other vocational qualifications in employment. More informative are analyses by qualification level by students’ age group and by field of education. Diplomas play different roles for young and older people. From additional tables and analysis reported in the support document we find that diplomas but not certificates give young people greater access to higher education than older people and to more highly skilled work. The most significant differences are observed by level of qualification within field of education, particularly narrow field of education. Some qualifications in some fields are needed for entry to or progression in some occupations, particularly those licensed by the state or strongly regulated by industry bodies. These qualifications are more likely to lead to employment, particularly relevant employment and skilled employment, much more than qualifications not leading to regulated employment.

This raises the question of what scope there may be for systemic changes to tertiary education to improve the link between education and work without such changes being led by the social partners: employers, unions and government. This is investigated in the case studies reported in the next chapter.

Case studies of mid-level qualifications

This chapter reports on the development of qualifications with an employment logic for preparing graduates for paraprofessional occupations in engineering and finance, and for physician assistants (health) and veterinary technologists (agriculture).

Associate degrees in engineering, mining and geoscience

The initiative for developing nationally consistent associate degrees in mining, engineering and geoscience came from the Minerals Council of Australia (2012), which ‘represents Australia’s exploration, mining and minerals processing industry, nationally and internationally, in its contribution to sustainable development and society. MCA member companies produce more than 85 per cent of Australia’s annual mineral output’. In 1998 the Minerals Council of Australia established a Minerals Tertiary Education Council to foster a network of selected university partners to cooperate in developing and delivering undergraduate and postgraduate programs in the earth sciences. The Tertiary Education Council was established following the publication of a discussion paper arguing for the reshaping of minerals tertiary education. The discussion paper found that:

- graduates often have a poor understanding of how their theoretical knowledge can be applied in practice. They also tend to be unaware of the importance of communication and ‘people skills’, how business decisions are made, occupational health and safety, the demands of life in (often remote) operational settings and other significant issues facing industry;
- industry has a poor record of employing new graduates, with most companies preferring to recruit professionals with some experience. The Western Australia Taskforce survey found that only 16% of responding companies intended to employ new graduates;
- industry uptake of new graduates is profoundly affected by the business cycle. This has established a ‘boom or bust’ environment for educators, graduates and ultimately, for industry, which is far from optimum;
- industry has been inconsistent and ad hoc in interacting with the tertiary education system. An example of this is the unwillingness of too many companies to offer students opportunities for their mandatory vacation work experience; and
- industry has adopted too narrow and restricted a view of what constitutes an acceptable preparation for a career as a minerals specialist, particularly as a mining engineer or metallurgist. With some important exceptions, this has robbed industry of the opportunity to diversify its sources of graduates and strengthen its standards of competence. It has also restricted an opportunity to make up the frequent shortages of specialist graduates.

(Minerals Council of Australia 1998, pp.5–6).

In 2012 the Minerals Tertiary Education Council established the Minerals Industry National Associate Degree project with funding from the Australian Government’s Workforce Innovation Program. The project seeks:

- The articulation of paraprofessional roles that share the workload with traditional four-year graduates;

- Formalised national collaboration by a consortium of at least four VET/dual-sector/higher education institutions to develop and deliver the Associate Degree programs;
- Two new industry-supported, nationally consistent and nationally accessible Associate Degree programs in the disciplines of mining engineering and minerals geoscience, including flexible learning platforms and support tools required to ensure high completion rates;
- At least four companies supporting their existing employees (including women and Indigenous Australians) to be up-skilled by participating in and completing the new Associate Degree programs;
- Expanded career and articulation pathways for mining engineers and geoscientists, including into the Associate Degree programs and from these to the workforce or further study;
- An Associate Degree program model and marketing strategies for education institutions and employers in the resources sector and other industries available for ongoing public dissemination.

(Minerals Council of Australia 2012b)

The project is piloting an associate degree of engineering offered by the University of Southern Queensland. The pilot is progressing well and has good potential to solve the problems identified by the Minerals Council of Australia and by the research more generally. Attracting interest from a broad range of employers, universities and TAFE (technical and further education) institutes, the project could be used as a general model for other disciplines. This case is the most successful of those studied, since, importantly, it involves collaboration by the three social partners. An industry association initiated the qualification, described the work role for which the qualification should prepare graduates and set the aims for the project. Educators consulted employers and their colleagues, developed the qualification, and now offer it in close association with employers. Governments established the regulatory environment and funded the development of the qualification, as well as subsidising its teaching and offering income-contingent loans for student fees.

The context for the project and the challenges of mid-level qualifications in engineering are described and discussed in the supporting document.

Financial planning

Financial planning emerged as a distinct occupation in Australia in the 1980s (Cowen, Blair & Taylor 2006). At that time practitioners were likely to be accountants, bankers or insurance brokers who were 'self-taught, with most having no specific formal education in financial planning' (Cowen, Blair & Taylor 2006). The industry grew extremely quickly after the introduction of compulsory superannuation, creating the impetus for regulating the industry following the 1996 Financial System Inquiry (FSI, or the Wallis Inquiry, 1997)

Financial planning is regulated as part of the financial services industry, along with the superannuation industry, under the *Financial Services Reform Act 2001* (Cull 2009; Jackling & Sullivan 2007). Under the Act, people providing financial advice must comply with Regulatory Guide 146: Licensing: Training of financial product advisers. Regulatory Guide 146 aims to 'protect consumers of financial advice by ensuring that those who provide the advice are competent to do so', because 'retail clients generally do not have the resources or expertise to assess whether their adviser has an appropriate level of competence to provide financial advice. It is important for ASIC to set training standards that ensure a level of competence' (Australian Securities and Investments Commission [ASIC] 2012, p.4).

Regulatory Guide 146 requires that those offering financial advice should have undertaken training at an equivalent of at least the AQF certificate III for tier 2 (financial product sellers) or AQF diploma for tier 1 (those providing independent financial advice) (Australian Securities and Investments Commission 2012). Training is likely to be continuing, for Regulatory Guide 146 requires that practitioners be trained in the particular areas in which they are providing advice, and that their knowledge is up to date. Training must be completed by a course listed on the ASIC training register, but this is to change to a self-regulated system in 2013. Entry to financial planning may therefore be through a Diploma or Advanced Diploma in Financial Services (Financial Planning) or equivalent as the minimum requirement under ASIC, or, above that, a bachelor's degree, postgraduate studies, or professional accounting qualification with a financial planning specialisation.

Three professional associations represent financial planners: the Financial Planning Association (FPA) as well as the accounting bodies CPA (Certified Practising Accountants) Australia and the Institute of Chartered Accountants in Australia (ICAA) (Cull 2009). The Financial Planning Association, formed in 1992 to develop financial planning as a profession, today has over 12 000 members, of whom around 5000 are certified CFP (Certified Financial Planners) (FPA interview 2012). The Financial Planning Association introduced certification of practising financial planners in 1997, with education key to certification and continuing registration (Cull 2009). Before 1 January 2007 financial planners could gain certification with FPA as a Certified Financial Planner having completed a Diploma or Advanced Diploma in Financial Services (Financial Planning), with additional training requirements offered through the Financial Planning Association. In 2007 the FPA moved to a bachelor for certification. From 2012 a bachelor degree will be required for practitioner affiliation as well (interview with the Financial Planning Association). The move by the association to require at least a bachelor qualification for certification as a Certified Financial Planner has been seen as motivated by a desire to have the industry recognised as a profession, and to bring it into line with professions such as accounting and law (Cowen, Blair & Taylor 2006; Jackling & Sullivan 2007).

Financial planning, then, has shifted in just three decades from a specialisation of accounting or insurance broking undertaken largely by self-taught practitioners, to a regulated industry requiring mid-level qualifications to practise, and finally to a nascent profession, which in practice requires the status of a bachelor or postgraduate qualification for a high-level career.

This apparent credential creep makes it harder for people to enter the industry at a modest level and work their way up just by learning and gaining experience in employment. It is an extremely pertinent example of a change in the way people navigate education-to-work, occupation-to-occupation and work-to-education-to-occupation pathways. The difference between membership of a regulated industry and membership of a high-status profession is spelt out in the explicit and implicit educational requirements. This has resulted in two very different types of qualifications being offered. One type was training for 'product sellers', delivered by a private college and sponsored by an employer to meet regulatory requirements. This was in sharp contrast to the bachelor or postgraduate education offered by a university, which met the requirements of the professional association. TAFE institutes approached for the study reported too few enrolments in their Diplomas in Financial Services (Financial Planning) to continue offering the qualification. This is not surprising in view of the very few full-year training equivalents enrolled in the qualification across Australia, and there were no enrolments in this qualification between 2007 and 2011, the latest year figures available (table 7).

Table 7 Full-year training equivalents enrolled in the diploma of financial services (financial planning) 2003–11

	2003	2004	2005	2006	2007	2008	2009	2010	2011
Full-year training equivalents	4.2	43.4	38.3	3.2	0.0	0.0	0.0	0.0	0.0

Source: VOCSTATS (<www.ncver.edu.au/resources/vocstats/intro.html> extracted 28/5/2013).

Physician assistant

Physician assistants originated in the United States. In 1961 Dr Charles L Hudson (1961, pp.839–40) proposed the ‘creation of two new groups of assistants to doctors from nonmedical and nonnursing personnel’, one of which would be ‘assistants with special training, intermediate between that of the technician and that of the doctor, who could not only handle many technical procedures ... but could also take some degree of medical responsibility’. Hudson proposed that this assistant would have two or three years of higher education plus ‘vocational training’.

The initiative for physician assistants in Australia came in 2006 from Peter Brooks (2006, p.14), then dean of the University of Queensland’s Faculty of Health Science. The first physician assistants’ program in Australia was the Master of Physician Assistant Studies first offered by the University of Queensland in July 2009 (University of Queensland 2010, p.86). The program comprised half a year of coursework and a full year of clinical rotations. The entry requirements were a bachelor’s degree in biological or health sciences or a related field and one year of direct patient care experience (University of Queensland no date). The program admitted 11 students in its first year and 23 students in its second year.

However, in May 2011 the University of Queensland announced that it would close its physician assistant’s program ‘in the light of a combination of key factors. This includes the resignation of the Program Director and the difficulty in recruiting a replacement within this field, the significant uncertainty about the future of a physician assistant workforce in Australia, and the associated financial risk’. Swan (Swan & Wilkinson 2012) described this explanation as ‘very diplomatic’. Others cited trenchant opposition from the Australian Medical Association and nurses (Edwards 2007; Jolly 2008, p.32; Swan & Wilkinson 2012; Sweet 2011a; Pashen in Sweet 2011b). Physician assistants were, however, supported by the Australian College of Rural and Remote Medicine (2011). The closure was criticised heavily by Brooks, now at the University of Melbourne (Sweet 2011b).

Other Australian universities have begun physician assistant programs. The University of Adelaide promoted a Master of Physician Assistant Studies in 2010 but is not offering the program in 2012. James Cook University (2011) introduced a Bachelor of Health Science (Physician Assistant) in 2012. The program comprises coursework for the first two years and clinical health service placements with limited residential blocks in the third year. Entrants are required to have a health-related degree or equivalent and a minimum of two years equivalent full-time experience in a healthcare setting that includes direct patient contact (James Cook University 2012). Edith Cowan University (2011) introduced a Master of Medical Science (Physician Assistant) program in 2011. The program’s entry requirements were a Bachelor in Biological or Health Sciences or a related field and one year of direct clinical care experience. The program comprised half-time coursework in the first year and four full-time clinical rotations in the second year. The program is not included in the university’s 2012 handbook.

The Australian and state governments seem likely to continue promoting physicians' assistants, since a review by Health Workforce Australia concluded that physician assistants could make a significant contribution to addressing a number of key health needs (Miller et al. 2011, p.1).

Veterinary technologist

Australia also followed the US in establishing veterinary technology programs, where they may have been introduced by extension from physician assistants. Kogan and Stewart (2009, p.220) argued that the US should introduce 'a mid-tier veterinary professional health care provider ... similar to the human medical profession's physician assistant'.

The first and currently only veterinary technology program offered in Australia is the Bachelor of Applied Science (veterinary technology extended major) offered by the University of Queensland. The program is broadly similar to other veterinary technology baccalaureates, such as that offered prominently by Purdue University since the late 1990s (Clarke, Schull & Coleman 2009, p.241). The first year establishes a foundation in sciences such as chemistry, biology, animal anatomy and physiology. The second year introduces biochemistry and microbiology and applied sciences such as genetics and animal breeding, animal reproduction and animal nutrition. The final year is intensively clinical, with a combination of laboratory classes and clinical placements, concentrating on small animals but also including equine and big animal health and management studies (Clarke, Schull & Coleman 2009, p.241). The clinical rotations and industry placements are in locations such as the university's veterinary teaching hospital, veterinary practices, zoos, wildlife parks, government agencies, welfare organisations, animal breeding enterprises and pharmaceutical companies. Students may complete the veterinary technology program jointly with a Certificate IV in Veterinary Nursing.

A review of rural veterinary services conducted for the Australian Government in 2003 argued that the veterinary profession should promote new models of rural practice and that scope exists for veterinarians and paraprofessionals in allied fields to work more cooperatively and closely (Frawley 2003 pp.77, 115). However, the review noted that 'Among older veterinarians, in particular, there is some antipathy towards para and other professionals' (Frawley 2003, p.76). The coordinator of the final year of the University of Queensland's veterinary technology program reports that veterinary practice is changing faster than veterinary principals realise. Opportunities for veterinary technology graduates are emerging in practice management, specialist technical areas such as emergency and critical care, dermatology, and veterinary research and pharmaceuticals. Opportunities are also arising in stock inspection for disease control and animal welfare regulation (Clarke 2004, p.39).

It is perhaps significant that the coordinator of the final year of the University of Queensland's veterinary technology program, Ms Patricia (Trish) Clarke, is a veterinary physician with close links with practitioners, and that the champion of the University of Queensland's physician assistant program, Professor Peter Brooks, is now Director of the Australian Health Workforce Institute. Maintaining such close knowledge of the relevant industry is feasible for the program coordinator and head of school, but is probably too detailed for most deans of faculty and other senior academic managers not directly related to the field.

Conclusion

Of the qualifications preparing graduates for the paraprofessional roles considered here, the one that seems to have the most potential for filling mid-level gaps in work is the minerals industry national associate degree. It is significant that this is a collaboration between the social partners: it is

sponsored by an industry body, supported by the Australian Government and was developed and is being offered by tertiary education institutions. It is also noteworthy that the project developed from the Minerals Tertiary Education Council, established by the Minerals Council of Australia in 1998, following a review which identified problems in both tertiary education and industry.

While the *Financial Services Reform Act 2001* requires a diploma for those providing independent financial advice, since 2007 the Financial Planners Association has required a bachelor degree for membership. This has effectively set the requirement for entry to practise and is undermining the viability of the Diploma in Financial Services (Financial Planning), reducing opportunities for people to enter the industry at a modest level and work their way up.

The programs for physician assistants and veterinary technologists are examples of educational institutions taking the initiative in establishing programs to prepare graduates for the paraprofessions. They have achieved only modest success so far, largely because of trenchant opposition from competing professionals. These two cases suggest the following conditions for educational institutions to introduce successful qualifications with an employment logic.

- Identify a role in the workforce.

The first and crucial step is to identify a role in the workforce to be filled by the new worker who would undertake the qualification. In their early and perhaps developmental form some of these statements of roles are somewhat vague; they tend to be cast in general terms so they don't limit the potential for the new worker to develop their role or to anticipate an objection that the proposed role is already performed by another worker. Initial role statements also tend to be ambiguous to avoid conflicts with other workers' roles. Most educational programs, particularly those with an employment logic, tend to incorporate structured work experience. A description of the work experience to be undertaken by students helps to clarify graduates' roles by stating the scope of their practice and the contexts in which it may be exercised.

- Convince employers of the benefits of the new role.

It is necessary to convince at least some employers of the benefits of the new work role. Many occupations are found in a variety of settings and are employed by different types of employers. In general, employers with few employees differentiate work roles less often than large employers, meaning that the latter are likely to be more receptive to the benefits of a new work role. Proponents may concentrate on the most receptive employers, at least initially. Again, students' work experience can usefully crystallise the extent of employers' support for a new role. While planning a new program, educational institutions may ask employers whether they would in principle and be likely to accept students on work experience. There seems little point in proceeding with a program unless it appears likely that work experience places will be available for most students. While a program is being introduced, work experience is as much experience for employers as it is for students, and if employers' experience is good they are more likely to employ the program's graduates.

- Understand workforce structure and dynamics.

The long-term prospects of mid-level job roles and thus mid-level qualifications depend on the structure of the relevant labour market and therefore the structure of the relevant industry and how both change. The staff developing and offering mid-level qualifications therefore need to have continuing close connections to the field.

Conclusion

In the first year of this project we noted that only 36.6% of VET graduates in 2007 were employed in the field of their training package six months after completing their program (Karmel, Mlotkowski & Awodeyi 2008, p.10; Moodie 2012, p.15). The support document accompanying this report notes that the proportion of vocational education graduates in 2011 employed in the same field as their training package barely increased, to 37.2%. This seems very low for qualifications that ‘specify the skills and knowledge required to perform effectively in the workplace’ as the National Skills Standards Council (2012, p.4) specifies.

The analysis of the 2011 Student Outcomes Survey and the historical analysis of the Survey of Education and Work reported here found few general, systemic trends in mid-level qualifications. For most students in most qualifications in most fields, there is a weak link between education and work. In general, Australian mid-level qualifications have an educational rather than an employment logic. There are, however, substantial differences in the outcomes of different mid-level qualifications by age group and field of education. Diplomas but not certificates give young but not older people access to higher education and to more highly skilled work.

The most marked differences are observed by level of qualification within field of education, particularly by narrow field of education. Some qualifications in some fields are needed for entry to or progression in some occupations, particularly those licensed by the state or strongly regulated by industry bodies. These qualifications increase employment, relevant employment and skilled employment much more than qualifications not leading to regulated employment.

This suggests that mid-level qualifications have one of three main roles, and that these roles are different for students in different age groups:

- as a labour market qualification – entry or upgrade
- as a transition to a higher-level qualification
- for widened access to higher-level qualifications.

Case studies of the minerals industry national associate degree, financial planning, physician assistants and veterinary technologists again suggest limited scope for tertiary education institutions alone to foster progression in vocations by initiating mid-level qualifications. Of the four qualifications examined, the mid-level qualification with the most potential for entry to and progression in a vocation is the minerals industry national associate degree. This is distinctive in being a collaboration between the social partners.

This suggests that to improve progression to and within vocations, policy should concentrate on the construction of work, and in particular, on encouraging and supporting industry bodies and intermediary organisations to improve the relation between employment and education. Industry or intermediary bodies may also usefully coordinate and codify employers’ expectations of tertiary qualifications, which will assist tertiary education institutions in designing and offering their qualifications.

The different outcomes for qualifications by field, level and students’ age group suggest that system-wide approaches are probably not the most effective. Educational institutions may increase the effectiveness of their qualifications by designing them differently to suit the different purposes they

serve. For example, in 2012, 37% of equivalent full-time diploma students were aged under 25 years.¹ From the 2011 Student Outcomes Survey, some 26% of diploma graduates aged between 15 and 19 years and 26% of diploma graduates aged between 20 and 24 years study at the level of bachelor degree or higher six months after graduation (NCVER 2011). The diploma is therefore, importantly, a transitional qualification for younger students. While some vocational diplomas provide successful transitions to higher education, the mid-level qualifications, which are mainly a transition to a higher-level qualification or which widen access to higher-level qualifications, are arguably more effective if they are higher education diplomas or associate degrees: they display more curriculum coherence with degrees and they have more capacity to include foundation studies and develop scholastic skills.

In contrast, qualifications which prepare graduates for one of the regulated occupations have a strong employment logic. While these qualifications should also provide the foundation for students to progress in their careers and update and upgrade their qualifications after graduation, qualifications with an employment logic should incorporate substantial amounts of work-integrated learning. They should have substantially different curriculum and pedagogy from transitional qualifications.

Policies and funding arrangements need to give institutions the flexibility to construct and offer their qualifications differently to suit the different purposes they serve. Moreover, given the different relation between education and work in different industries and the greater potential for some compared with others to develop closer links, it would be appropriate to develop differentiated skill-formation strategies to support these closer links, where that is possible, and to develop alternative strategies in other industries. Strategies in other industries may emphasise qualifications as 'screening' qualifications rather than being specific preparation for specific occupations.

Vocational streams

The different roles and logics of qualifications may be encompassed within the concept of vocational streams. We explored the notion of 'vocations' and 'vocational streams' in year one of this project (Wheelahan et al. 2012). Vocational streams consist of linked occupations that relate to the core underpinning concept and set of practices; for example, care and care work. Preparation for a vocational stream implies that education will have a broader focus because it is preparation for a number of linked occupations rather than being specific preparation for specific jobs. In preparing students for vocational streams the focus will need to move beyond specific tasks and roles within jobs, to 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 within a broadly defined field of practice, in which educational and occupational progression is combined.

Preparation for vocational streams fosters identification with the field of practice rather than with a specific employer, enterprise, job or occupation. Preparation for vocational streams requires education in related clusters of knowledge and skills, which allows individuals to progress and/or specialise within a field of practice, or to move laterally into related occupations. Preparation for work would need to be based on a continuum of knowledge and skill that links work, vocational and higher education and include the capacity to accrue skills coherently and cumulatively. The notion of vocational streams is premised on the structure and nature of work, but it allows for differentiation between different fields of practice and different emphases in the qualifications that prepare people for work, while still incorporating the three purposes of qualifications as outlined above. Even in those areas where there are tight relations between education and work, it would be necessary to

¹ Calculated from VOCSTATS (<www.ncver.edu.au/resources/vocstats/html>, viewed 13 August 2013).

ensure that the qualifications support educational progression as well as widening participation. Indeed, using vocational streams as the framework for the preparation for work requires greater emphasis on the educational purposes of qualifications if they are to support and link occupational and educational progression.

Such an approach could help to support occupational progression in areas where there are tight links between education and work because the social partners' attempts to build occupational structures (as in the engineering case study) can be supported. This approach also has the potential to support occupational progression in areas where links are looser: qualifications would help students enter a broader range of occupations and support their educational progression. Qualifications in both instances may look quite different and emphasise different aspects of the three purposes of intermediate qualifications in different ways. Strand three's report examines these issues from a labour market perspective and considers the nature of practice and partnerships between social partners that would be needed to support vocational streams (Yu, Bretherton & Buchanan, forthcoming).

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Support document details

Additional information relating to this research is available in *Vocational education's variable links to vocations: support document*. It can be accessed from NCVET's website <<http://www.ncver.edu.au/publications/2689.html>> and contains the following information:

- Introduction
- Employment, study and skills outcomes of mid-level qualifications
- Appendix: employment and study outcome regression results
- Are diploma graduates losing mid-level jobs to bachelor graduates?
- Case study: associate degrees in engineering, mining and geoscience
- Case study: financial planning
- Case studies of physician assistants and veterinary technologists
- References

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