

Submission to the Review of Australian Higher Education

July 2008



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Key points in this Submission:

- The number of places for domestic university students should be increased
- The scale of this increase should be substantial
- There is ample scope to increase post-school training given the high proportion of young adults not engaged in such training and the low share of Australian-born adults who hold university credentials
- Demand for analytic and communication skills seem likely to increase in the future job market
- There should be an expansion in the availability of university places across the spectrum of vocational and less vocational fields of study
- Australia's higher education system needs to be geared for the demands in work and research created by a carbon-constrained future
- There should be a closer integration of TAFE programs with university courses.

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Submission to the Review of Australian Higher Education: Introduction

The Review Discussion Paper,¹ recognises the importance of a flourishing higher-education system, not only for its role in providing skills for the labour market, but also for its contribution to Australia's fundamental and applied research effort, as well as to civic life in Australia. Our focus is on the labour market contribution. The evidence cited below on the extent of shortages of professionals trained in Australia would seem to imply that expansion of the system is warranted on this ground alone.

The Discussion Paper is open to this proposition. However, it introduces a note of caution on several grounds. It presents comparative evidence indicating that the share of the Australian workforce with degree qualifications compares well with other developed countries. It notes that there seems little sign of unmet demand from the school-leaver cohort eligible for university and that the size of the university-age cohort in Australia is not large enough to justify an increase in the share attending university. The Paper also indicates concern that any increase in this share may be at the expense of enrolments in the VET sector. In addition, the Discussion Paper indicates that the Review has not reached any firm conclusions about the likely scale of growth in demand for persons with higher-education qualifications. It cites widely-varying opinion on the matter.

This submission will first explore two main issues. The first concerns the adequacy of the higher-education training record in Australia. To the extent that it is inadequate, we explore the implications of any expansion in higher-education participation rates.

The second issue is the outlook for labour-market demand for university-trained persons. We then proceed to examine other issues germane to the Inquiry, including the adequacy with which graduates' skills are being utilised by Australian employers, the extent to which course availability should be better structured to meet skill needs in future (including those needed as Australian industry moves towards a more sustainable energy base) and, finally, issues concerning linkages between the higher education and vocational education sectors.

A brief comment on the labour market for university graduates

These comments are designed to set the scene for the submission. Australia has experienced a long economic boom, which has generated massive growth in employment levels. According to census data for 1996 and 2006, the number of employed workers in Australia grew by 19.2 per cent, from 7.6 million in 1996 to 9.1 million in 2006, or overall growth of 1.47 million. Thirty per cent of this growth was amongst persons employed in professional occupations. By comparison, there was a nine per cent growth in the number of persons employed as managers, 16 per cent growth in associate professionals and seven per cent growth in those employed as tradespersons.²

This pattern has continued since the Census was conducted. Table 1 shows the share of growth by major occupation group over the five year period May 2003 to May 2008. This data is drawn from ABS Labour Force Survey estimates. The table uses the superseded ASCO definitions in order to facilitate comparisons with the Census

data. This is because the 1996 Census data is only available according to the ASCO definitions.

The total growth in the employed workforce over the five year period to May 2008 of 1.2 million is massive. The share of this employment growth attributable to employment in professional occupations is 30.5 per cent – almost identical with the period 1996 to 2006. However, there have been some changes. The share of growth attributable to managers has increased to 21 per cent (compared with nine per cent), as has that of tradespersons, up from seven per cent to 12 per cent.

Table 1 Employed persons (000s) by occupation, occupation change and share of growth May 2003 and May 2008

	May-03	May-08	Change May 03-May 08	Occupation's share of total growth (%)
Managers and Administrators	675.1	930.3	255.2	20.9
Professionals	1751.2	2124.1	372.9	30.5
Associate Professionals	1185.3	1330.4	145.1	11.9
Tradespersons and Related Workers	1201.5	1346.4	144.9	11.9
Skilled occupations	4813.1	5731.2	918.1	75.2
Advanced Clerical and Service Workers	381	375.9	-5.1	-0.4
Intermediate Clerical, Sales and Service Workers	1639.5	1779.5	140	11.5
Intermediate Production and Transport Workers	808.5	917.2	108.7	8.9
Elementary Clerical, Sales and Service Workers	950.8	965.2	14.4	1.2
Labourers and Related Workers	865.6	910.2	44.6	3.7
Other occupations	4645.4	4948	302.6	24.8
Total	9458.5	10679.2	1220.7	100.0

Source: ABS, Monthly Labour Force Survey 2003 to 2008

Since most professionals hold degree qualifications, as do about a third of managers (documented below), the expansion in the ranks of professionals and managers implies a sharp increase in the number of and demand for degree-qualified employed persons in Australia.

Yet, at the same time as this growth in demand has occurred, there has been little increase in the number of domestic completions in Australian universities. Table 2 provides this detail for undergraduate completions by broad field of study. This completion situation reflects the policy adopted by the former Coalition Government after it came to office in 1996, of maintaining a cap on the number of Commonwealth subsidised places. The Coalition hoped that increases in training for domestic students might come from an expansion in the number of full-fee domestic students. This did not occur, however, except in law, which is included in the society and culture field of study.

Table 2 Domestic undergraduate completions by major field of study, 2002 to 2006

Major field of study	2002	2003	2004	2005	2006	Growth 2002-2006	
						N	%
Sciences	10035	10024	10514	10786	10774	739	7.4
Information technology	5648	6056	5647	5152	4140	-1508	-26.7
Engineering	6062	6049	6380	5878	6213	151	2.5
Architecture/building	2328	2356	2354	2577	2717	389	16.7
Agric./Environment	2748	2875	2591	2379	2219	-529	-19.3
Health	14149	14086	14909	15157	15826	1677	11.9
Education	12074	12670	12780	12962	12596	522	4.3
Management and Commerce	19735	20225	20272	20536	20745	1010	5.1
Society and Culture	25158	25841	26546	25563	26213	1055	4.2
Creative Arts	7940	8940	8932	7949	9503	1563	19.7
Food/Hospitality	25	26	15	23	36	11	44.0
Total	105902	109148	110940	108962	110982	5080	4.8

Source: DEEWR, Higher-education data collection, unpublished

The combination of strong demand for university-trained persons, yet stable completion numbers, has led to widespread shortages of degree-qualified professionals. A key response from the former Coalition government and, so far, from the Rudd government has been to increase the skilled migration program.

The number of visas issued to principal applicants with professional occupations under the temporary entry 457 visa program and to applicants under the permanent entry skilled visa subclasses has increased substantially in recent years. In the case of the 457 visa program, in 2007-08, there were 58,050 visas issued to principal applicants (up from 46,680 in 2006-07). Of this 58,050, 33,890 visas were issued to persons who were sponsored to fill professional positions.³

In the case of permanent entry program, the great majority of visas have also been allocated to professionals. By 2005-06, there was a net inflow of persons with professional occupations from the international movement of Australian residents and from immigration of 45,259.⁴ The scale of this movement is indicated by comparison with the 111,000 domestic undergraduate completions in 2006 (see Table 2).

Within the permanent entry program, the share of these visas issued onshore to former overseas students who have completed their courses in Australia has also increased. By 2007 the number of principal applicants issued with such visas reached around 20,000, the great majority of whom were former overseas students who had completed Australian university qualifications, particularly in accounting and IT. The Discussion Paper has little to say on this issue.

Most of the growth in onshore completions at Australian universities since 1996 has been amongst overseas students who have completed undergraduate or post-graduate courses. Their numbers grew from 38,107 in 2002 to 60,969 in 2006, with nearly 20,000 of the latter subsequently obtaining permanent residence visas in 2006-07. These students are therefore now playing an important role in the supply of graduates eligible to work in Australia. Their success in gaining professional or managerial positions is another matter. This issue is explored further below.

What is Australia's record of higher education training?

The Discussion Paper provides data that indicates the overall Australian record on higher education is good. The Paper says that 'the Australian population has a relatively high level of university attainment compared with other OECD countries'.⁵ This statement is supported by a chart showing that the share of Australia's working age population with degree qualifications has trended upward since 1991 to reach just over 20 per cent by 2006 (Figure 10 p. 27). The Discussion Paper cites the OECD's *Education at a Glance* that 29.2 per cent of 25-34 year old Australians are university qualified.⁶

The Australian record does not look as good when the record of enrolment in post-school education is examined. The proportion of young people in Australia aged 18-20 who were still at school or engaged in any form of post-school training was only 52.7 per cent in 2006. This means that 47.3 per cent of 18-20 year olds were not enrolled in any form of high school or post-school education whether in the vocational

or higher-education sector. The proportion of 18-20 year olds engaged in higher education in 2006 was 28.9 per cent.⁷ This share seems low compared with the OECD figure of 29.2 per cent for university qualified in the 25-34 age group. This is because many of those enrolled do not complete their higher-education qualification.

Table 3 indicates that Australia's relatively good record regarding the share of the population with degree qualifications depends significantly on migration. The proportion of those born in Main-English-Speaking Countries (MESC) and those born in Non-English-Speaking Countries (NESC) aged 30-39 with degree qualifications is far higher than is the case for the Australian-born.⁸ Only 22 per cent of the latter hold degree qualifications.

Table 3 Share of persons by age group and birthplace group with post school qualifications, 2006

Birthplace	Age	Bachelor Degree or higher		Certificate levels III & IV	Balance of Certificate Level	No post school qual.*	Total	Total* N
		Diploma						
Australia	20 TO 29	18	7	19	5	52	100	1885575
	30 TO 39	22	9	20	4	45	100	1987003
	40 TO 64	17	9	17	3	54	100	4031776
	Total	18	8	18	4	51	100	7904354
MESC	20 TO 29	25	8	14	4	48	100	139203
	30 TO 39	30	11	16	3	39	100	253214
	40 TO 64	20	11	19	3	47	100	795171
	Total	23	10	18	3	46	100	1187588
NESC	20 TO 29	37	10	6	2	45	100	405473
	30 TO 39	38	11	9	3	40	100	428360
	40 TO 64	21	9	12	2	56	100	1145614
	Total	28	9	10	2	50	100	1979447
Total OS-born	20 TO 29	34	10	8	3	46	100	544676
	30 TO 39	35	11	12	3	40	100	681574
	40 TO 64	21	9	15	3	52	100	1940785
	Total	26	10	13	3	49	100	3167035
Total**	20 TO 29	20	7	15	4	53	100	2624298
	30 TO 39	24	9	17	3	47	100	2865657
	40 TO 64	17	9	16	3	56	100	6426848
	Total	19	8	16	3	53	100	11916803

Source: ABS, 2006 Census, customised data set, held by CPUR

* Includes not stated

** Total includes birthplace not stated

This evidence, that nearly half of all 18-20 year old Australians are not engaged in any form of post-school training, and that the share of Australian-born persons with degree qualifications is low, points to the conclusion that there is no lack of young people in Australia who could potentially undertake post-school education, including at the university level.

It is true that the size of the late teenage cohort in Australia will fall a little after peaking at around 2011. It will not be until about 2020 that the numbers in this cohort begin to increase again. However, this situation should not be a factor in shaping Australia's post-school training policies, given the sizeable share of the current generation who are not engaged in any post-school training. Furthermore, as the following evidence on labour market trends indicates, the occupations which are most in demand are at the high skilled end of the occupational spectrum.

Australia's changing job market and the demand for graduates

As indicated, since 1996, most of the job growth in Australia has been amongst those employed in managerial, professional, associate professional and trade occupations which normally require post-school credentials. About 30 per cent of total job growth

has been amongst persons employed in professional occupations, most of whom hold degree-level qualifications (see below). Associate professional and managerial occupations have also contributed significantly to job growth; by 16 and nine per cent respectively. These two occupational categories include a substantial number of VET as well as university graduates. The share of employment growth attributed to the trades sector was modest – just seven per cent of total job growth. If this pattern of labour market growth continues, it will imply an increasing demand for persons with post-school qualifications. We consider this issue first before turning to the next question central to the Higher Education Review, which is the level of education of the qualifications likely to be in demand.

Structural change and the demand for post-school credentials

The record of the past decade implies that the pattern of industry growth in Australia strongly favours employment at the skilled end of the occupational spectrum, particularly those in professional occupations.

Table 4 details the changes in numbers employed in each major occupational group by industry over the period 1996 to 2006. It is clear from this table that the key structural change in the Australian economy is the sharp job growth in service industry employment relative to that in the goods producing industries of manufacturing and agriculture. The exception here is mining, where vigorous growth is occurring, though off a low base. The only other major industry outside the service sector where employment expanded sharply is construction.

Table 4 Change in employment in skilled occupations and other occupations between 1996 and 2006 and share of occupational growth in government, Australia

	Skilled occupations					Other occupations	
	Managers and Administrators #	Professionals	Associate Professionals	Tradespersons	Total skilled occupations	Other occupations	Total**
Agriculture, forestry and fishing	-297	596	917	-1,988	-772	-10,699	-13,793
Mining	2,797	4,966	2,225	3,240	13,228	7,238	20,238
Manufacturing	18,465	20,103	1,797	370	40,735	-6,179	32,204
electricity, gas and water	2,924	4,893	1,184	2,005	11,006	1,229	12,079
Construction	21,014	9,906	20,097	92,338	143,355	76,025	220,611
Wholesaling	5,946	3,609	-1,897	-6,630	1,028	-14,957	-14,050
Retailing	401	10,647	31,667	3,205	45,920	218,353	263,863
Accommodation Cafes and Restaurants	1,417	-217	21,755	2,689	25,644	52,052	78,197
Transport and storage	4,907	5,183	1,989	186	12,265	58,544	71,254
Communication Services	2,430	5,351	-7,675	-7,656	-7,550	-10,693	-18,304
Finance and insurance	10,359	20,362	28,268	-495	58,494	-11,256	50,585
Property and business services	20,552	104,432	45,875	3,869	174,728	49,516	227,126
Government administration	15,235	49,975	21,780	-1,434	85,556	35,688	120,167
Education	10,580	83,759	10,302	-2,635	102,006	37,266	138,711
Health and community services	10,437	97,198	33,232	-7	140,860	108,316	251,419
GEH	36,252	230,932	65,314	-4,076	328,422	181,270	510,297
Cultural and recreation services	1,858	4,344	5,621	2,068	13,891	9,903	23,862
Personal services	2,297	5,260	9,127	13,269	29,953	15,232	44,313
Non classifiable economic units	418	8,004	2,346	2,230	12,998	-1,750	9,896
Not stated	142	469	201	1,125	1,937	6,405	-27,449
Total	131,882	438,840	228,811	105,749	905,282	620,233	1,472,794
GEH as % additional jobs 1996-2006	27	53	29	-4	36	29	35
Occupation share of total growth	9	30	16	7	61	42	100

Source: ABS, customised 1996 and 2006 census datasets held by CPUR

Does not include farmers and farm managers

** Total includes not stated and inadequately described

The key service industries are retailing, finance and insurance, property and business services, government administration, education and health and community services. Only in the case of the retail industry is employment growth occurring rapidly at the semi-skilled or unskilled end of the skills spectrum. In the case of the other service industries, most of the employment growth between 1996 and 2006 was at the

professional level and to a lesser extent at the associate professional and managerial level.

The table highlights the role of the government administration, education and health industries (when grouped together as the GEH industries) in providing employment for professionals. These industries are very 'professional-intensive'. Of the total increase in employment in the GEH industries, of 510,000 between 1996 and 2006, nearly half, or 231,000, was amongst persons filling professional-level occupations. Even more striking, Table 4 shows that 53 per cent of all the growth in professional employment between 1996 and 2006 occurred in these three industries. The property and business services sector was the other major contributor to growth in professional employment over the decade.

It seems likely that structural change will continue along the 1996 to 2006 pathway. Both manufacturing and agriculture will be under continued pressure of global competition and a high Australian dollar fortified by resource-industry-based exports. Not much employment growth at the associate professional or trade level can be expected in these industries.

Meanwhile, solid economic growth is producing strong earnings gains for employed Australians and tax revenues for the Commonwealth and State governments. These governments are being confronted with demands for additional infrastructure, health, education and administrative services and, because of the tax situation, are in a good situation to pay for these services. In the business sector, there is concurrent rapid growth in demand for financial and property and business services from both enterprises and individuals. As indicated, these services employ large numbers of professionals.

Job enrichment and higher education credentials

The previous comments cover what is usually referred to as the skill deepening phenomena, that is, the tendency for structural change to favour occupations at the higher-skilled end of the occupational spectrum. But, which skills and at what level?

There is a tendency for employers to expect their workers to possess a wider range of skills and, thus, have completed more training to fill occupations at the skilled and even semi-skilled occupation level than was the case in the past. What this has meant, in practice, is that the level of training required for these occupations has tended to rise.

Table 5 shows this outcome. It compares the level of qualification by occupation for employed persons aged 40-44 and 25-29 as of 2006. The occupations of teaching, nursing and engineering are all clear examples where the level of qualification has risen. Those entering these professions some two decades ago could do so with a diploma qualification or, in the case of engineering, sometimes after on the job experience plus a Certificate level course. This is evident for the 40-44 year old age group. Some 13 per cent of the engineers, 14 per cent of school teachers and 25 per cent of nurses held diploma qualifications. Another 12 per cent of those employed at the professional level in engineering held certificate qualifications. However few of the younger, 25-29 year group held sub-degree level qualifications. Only four per cent

of the engineers held diploma qualifications, as did two per cent of the teachers and seven per cent of the nurses.

Table 5 Employed persons 25 to 29 years and 40 to 44 years, occupation* by level of post-school qualification, Australia ,2006

	25 to 29 years							Total	40 to 44 years							Total
	Per cent								Per cent							
	Bachelor and above	Diploma Level	Certificate III IV	Certificate I II Level	Other Certificate Level not defined	Not applicable	Total		Bachelor and above	Diploma Level	Certificate III IV	Certificate I II Level	Other Certificate Level not defined	Not applicable	Total	
							Numbers								Numbers	
1 Managers	32	12	16	2	2	36	100	86241	29	12	19	1	2	37	100	163718
2211 Accountants	83	6	2	0	0	9	100	19122	75	12	3	1	0	9	100	13356
2251 Advertising and Marketing Professionals	69	10	4	1	2	14	100	7578	47	15	9	1	3	24	100	3510
232 Architects Designers Planners and Surveyors	63	20	6	1	1	10	100	13322	53	20	9	1	3	14	100	8273
233 Engineering Professionals	86	4	4	0	0	5	100	11896	70	13	12	0	1	3	100	9447
234 Natural and Physical Science Professionals	92	3	1	0	0	4	100	10295	85	6	3	0	1	5	100	8598
241 School Teachers	96	2	0	0	0	1	100	33499	83	14	1	0	0	2	100	34122
2421 University Lecturers and Tutors	95	2	0	0	0	3	100	2587	96	1	1	0	0	1	100	4608
251 Health Diagnostic and Promotion Professionals	91	3	2	0	0	4	100	6875	66	20	6	0	2	7	100	5336
252 Health Therapy Professionals	97	2	0	0	0	1	100	7148	89	9	1	0	0	2	100	5289
253 Medical Practitioners	98	0	0	0	0	2	100	5175	98	1	0	0	0	1	100	7405
254 Midwifery and Nursing Professionals	85	7	5	0	0	3	100	14749	63	25	8	1	0	4	100	27070
26 ICT Professionals	69	10	5	1	1	14	100	23351	59	14	7	0	2	17	100	19628
271 Legal Professionals	97	1	0	0	0	2	100	8150	94	2	1	0	0	3	100	5954
272 Social and Welfare Professionals	82	7	4	0	1	7	100	7508	71	13	5	0	2	9	100	8903
Remainder of Professionals	62	11	7	1	1	17	100	57143	49	16	11	1	2	21	100	57847
3 Technicians and Trades Workers	8	7	59	1	1	24	100	146594	6	8	60	1	1	24	100	147878
4 Community and Personal Service Workers	21	19	20	3	4	33	100	78830	11	16	25	2	5	40	100	85858
5 Clerical and Administrative Workers	26	12	15	4	4	40	100	136599	14	11	12	2	4	57	100	166821
6 Sales Workers	19	10	14	4	3	50	100	75942	8	8	15	2	3	63	100	72587
7 Machinery Operators And Drivers	6	4	21	2	2	65	100	50407	3	3	22	1	1	69	100	78923
8 Labourers	9	5	17	3	2	65	100	78555	4	4	17	1	2	72	100	100370
Total	34	9	20	2	2	33	100	881566	24	10	21	1	2	41	100	1035501

Source, ABS, 2006 Census, customised data set held by CPUR

* Data do not include occupation not applicable or inadequately described and level of education not stated or inadequately described.

It is no surprise that this trend has occurred in the nursing and teaching fields, as these are registrable occupations for which the relevant degree level qualification is a mandatory requirement for employment. But the trend is also evident in major non-registrable occupations, including information technology, accounting, advertising and marketing and the social and welfare professions. In every case, Table 5 shows that there has been a decline in the share of the more recent entrants to these occupations (those aged 25-29) who possess diploma level credentials relative to the older 40-44 year old group of workers employed in the same occupations. For example, 19 per cent of the accountants aged 40-44 held diploma qualifications compared with six per cent of accountants in the 25-29 age group.

The trend towards more training for particular occupations shows no signs of relenting. One of the reasons for this is that, at the higher-skilled end of the occupational spectrum, there is less expected at the routine level (which is increasingly managed via software programs as in accounting and engineering which can take care of such tasks) and much more at the communication and developmental level. This tends to favour persons with higher education credentials.

This trend is reflected in the recent revision of Australia's occupational classification system from ASCO to ANZCO. Under the ANZCO classification, introduced in 2006, a number of occupations classified as associate professionals have been reclassified as professional level occupations. An example is the burgeoning field of financial planning and advising. According to the ANZCO dictionary, this occupation now usually requires a university degree. It is included as a professional occupation rather than as an associate professional occupation as was the case under ASCO.

This does not mean that diploma credentials are outmoded. Rather, it means that there is now a different range of occupations for which a diploma-level qualification is relevant. This shift is indicated in Table 6, which shows the numbers of persons who held degree and diploma-level qualifications by field of study for persons aged 25-29 and 40-44 as of 2006.

As would be expected, the share of persons aged 25-29 with diploma qualifications in engineering, nursing, teaching and accounting is much lower than for those aged 40-44. The most striking areas of growth in the numbers of diploma holders (for 25-29 year olds relative to 40-44 year olds) is in the fields of study of business and management, the remainder of management and commerce, society and culture, the creative arts, and hospitality and personal services. Many of those holding these diploma qualifications are employed at the semi-skilled end of the occupation spectrum. The evidence for this statement comes from Table 5, which shows that there are heavy concentrations of diploma holders amongst those aged 25-29 who are employed as community and personal service workers, clerical and administrative workers and sales workers.

Are Australians over educated?

This question may be prompted by the findings shown in Table 5, which indicate that some 21 per cent of 25-29 year old persons employed in community and personal service occupations, 26 per cent of those employed in clerical and administrative

occupations, 19 per cent of those in sales occupations and even nine per cent of labourers hold degree level qualifications.

To some extent, this finding can be attributed to initial difficulties graduates often encounter in obtaining the experience necessary to enter professional positions. As Tables 7 and 8 below show, the share of Australian-born persons holding degree qualifications, including in the society/culture/creative arts field of study, who are not employed in professional or managerial occupations is far lower for the age group 30-64 than it is for the age group 20-29.

A significant component of 'underemployment' also derives from the high proportion of NESM migrants who hold degree level qualifications, but who are unable to gain professional and managerial positions. This point is evidenced in Tables 7 and 8 below.

However these points do not provide a full explanation. There may be many other reasons why degree qualified persons do not hold professional or managerial occupations. In particular, women who are heavily engaged in child raising duties may be only wish to take on part-time work outside their professional field. Some further possible reasons are explored later in this submission.

Table 6 shows that there is a strong trend towards an increasing share of Australian workers who hold degree level qualifications. In 2006 some 34 per cent of those aged 25-29 held such qualifications compared with 24 per cent of those aged 40-45. However, this expansion has not been at the expense of those holding Certificate-level qualifications. The share of 25-29 year old employed persons with Certificate qualifications (from level I to IV) was 22 per cent in 2006. This is the same level as for those aged 40-44 in 2006.

Indeed, it has been argued by Shah and Burke in their study *Qualifications and the Future of the Australian Labour Market*, that over the period 2006 to 2016 there is likely to be a greater rate of growth in numbers of persons in the workforce who hold VET qualifications than there will be of those holding university qualifications.⁹ Shah and Burke base this finding on an analysis of trends during the period 2001 and 2005. They attribute most of the projected growth in VET qualification holders to persons already in the workforce who (if the 2001-2005 experience is repeated) will upgrade their qualifications.¹⁰ Their work indicates that this pattern is strongest amongst persons employed in the trades and in the clerical, service and semi-skilled blue-collar industries.¹¹

Table 6 Persons 25 to 29 years and 40 to 44 years, Field of study by level of post-school qualification*, Australia ,2006

	25 to 29 years					40 to 44 years				
	Bachelor and above		Advanced Diploma and Diploma Level		Total	Bachelor and above		Advanced Diploma and Diploma Level		Total
	N	%	N	%	N	N	%	N	%	N
01 Natural and Physical Sciences	25188	7	1216	1	27112	22415	8	2307	2	26534
02 Information Technology	28534	8	8134	8	43264	13429	5	5735	5	25017
0313 Electrical and Electronic Engineering and Technology	4578	1	2365	2	23411	4159	1	5306	4	36641
Remainder of 03 Engineering and Related Technologies	21179	6	5200	5	80865	19750	7	10917	9	124455
040101 Architecture	3052	1	991	1	4170	2472	1	638	1	3637
Remainder of 04 Architecture and Building	3713	1	1867	2	35933	2573	1	2509	2	46439
05 Agriculture Environmental and Related Studies	7181	2	2950	3	21029	4769	2	4035	3	20590
0601 Medical Studies	5908	2	3	0	5911	8479	3	29	0	9182
0603 Nursing	14658	4	1937	2	20367	20791	7	12002	10	45614
Remainder of 06 Health	21352	6	3658	4	30075	15008	5	7273	6	30072
0701 Teacher Education	39974	12	2222	2	42817	42378	15	11231	9	57018
Remainder of 07 Education	1368	0	135	0	2278	3928	1	430	0	7914
0801 Accounting	21659	6	4380	5	28282	18876	7	7564	6	32545
0803 Business and Management	27374	8	13534	14	63016	26769	10	14878	12	59877
080505 Marketing	7814	2	2819	3	11430	2971	1	1655	1	5601
080901 Secretarial and Clerical Studies	76	0	1401	1	10770	319	0	5403	4	20675
081101 Banking and Finance	5482	2	1376	1	8529	2947	1	1836	1	6575
Remainder of 08 Management and Commerce	18671	6	8326	9	44391	7030	3	6984	6	26748
0909 Law	12829	4	237	0	13108	9517	3	178	0	9988
Remainder of 09 Society and Culture	40808	12	15161	16	74616	37441	13	13083	10	72687
10 Creative Arts	23837	7	10044	10	40400	11353	4	6717	5	24598
11 Food Hospitality and Personal Services	1254	0	8469	9	50978	330	0	4926	4	40744
12 Mixed Field Programmes	24	0	13	0	354	16	0	27	0	923
Total	336513	100	96438	100	683106	277720	100	125663	100	734074

Source, ABS, 2006 Census, customised data set held by CPUR

* Data do not include persons with no post-school qualification and post-school qualification not state or inadequately described.

** Data do not include persons whose education level is not stated, inadequately described or not applicable.

Implications for training policy

On this analysis, there is a strong argument for an educational revolution across both the higher-education and VET sector. The Review of Higher Education will have to look at this conclusion in the broader context. Are there sufficient young people to allow for an increase in enrolment levels in both the higher education and VET sector? In particular, if enrolments were increased in the higher education sector, would it be at the expense of the VET sector? What kind of inducements will have to be offered to potential domestic students to attract them into post-school training? Does the immigration program offer an alternative source of skills?

On the first point, our analysis indicates that there is no shortage of potential domestic students. Young Australians enticed into training would benefit from the long-term financial gains attributable to investment in their education. Australian employers would benefit from the greater availability of skills (as would the larger community) from the stimulus this would give to economic growth in Australia. Nevertheless, the *Discussion Paper* expresses concern that any move to increase higher-education enrolments may be at the expense of enrolments in the VET sector.

In our view these worries are groundless. In the case of diploma enrolees, an increase in higher-education participation would probably affect TAFE enrolments at this level. Universities and TAFE diploma courses tend to draw from the same pool of year 12 completers. Those with the highest ENTER scores enrol in universities, with those missing out on a university place in the main, enrolling in TAFE or moving into the labour market.

As the analysis above has shown, few students currently enrol in nursing or teaching at the diploma level. In addition, most students aiming to enter the major non-registrable professional occupations, including engineering and most professional-level occupations within the finance and insurance and property and business services industries need a relevant university qualification.

This means that TAFE must and is finding a new role in providing training for para-professional and associate professional occupations. As noted, the numbers holding diploma-level qualifications (amongst 25-29 year olds relative to those aged 40-45) has grown at the para-professional level in business and management fields, in the hospitality area and in the society and culture and creative arts areas (some of whose courses are similar to those offered at the university level in Arts faculties).

The challenge in the case of certificate III courses is to find a way to attract more young people into apprenticeships and to encourage them to finish their indenture. The Rudd government has already taken the initiative to create several hundred thousand additional training places. While these training places will have little impact on Certificate III enrolments that depend on employers offering apprenticeships, the availability of these training places should give a welcome impetus to Australia's overall training effort at the VET level.

Is Immigration the answer?

There are tight limits on the availability of skilled migrants who have credentials acceptable to Australian employers, relevant experience and the communication skills required for professional and managerial positions in Australia. Skilled migrants trained in Main-English-Speaking Countries (MESC) are often successful in meeting most employer expectations. Over time a substantial number of these migrants have been important contributors in the metal, electrical and construction fields. But they constitute a minority of Australia's recent skilled-migrant influx.

Most skilled migrants are now coming from Non-English-Speaking-Countries (NESC) the great majority of whom were previously employed as professionals or hold professional qualifications. Over the past decade, an increasing share of this NESC flow has been drawn from former overseas students trained in Australian universities. This focus on professional qualifications is appropriate, given the labour market trends analysed above. What may be problematical is the capacity of NESC professionals to meet employers' skill expectations.

Tables 7 and 8 indicate the employment outcomes for degree-qualified migrants by major field of qualification grouped by age group (20-29 and 30-64) and by whether born in MESC and NESC countries. The focus is on migrants who arrived in Australia between the years 2001 and 2006 and who were still in Australia at the time of the 2006 Census. For purposes of comparison, the tables provide information on employment outcomes for all Australian born degree qualified persons aged 20-29 and 30-64 years.

The tables show that recently-arrived, degree-qualified MESC migrants do just as well in obtaining professional and managerial jobs as their Australian-born counterparts. NESC-born degree-qualified migrants, however, do less well. The situation as of 2006 confirms the findings of earlier studies on this matter. Only a minority of the recently-arrived NESC-born group that we might have expected to have gained professional or managerial positions have succeeded in doing so. One important policy issue flowing from this situation is that a number of recently-arrived skilled Australian residents would benefit from appropriate further training in Australian education institutions, or other forms of assistance that would enable them to gain an appropriate managerial or professional occupation.

Migration is a valuable but not wholly satisfactory solution to Australia's current and likely future skill shortage dilemma.

Table 7 Per cent and numbers of Australian-born and overseas-born persons (who arrived 2001 to 2006) aged 20 to 29 years, with bachelor degree or higher, by field of qualification and job outcomes, 2006

Birthplace group	Field of qualification	Managers	Same field	Other Professionals	Technicians and Trades Workers	Community and Personal Service			Machinery Drivers	Inad. stated/Not app	Total employed	Unemployed	Not in the labour force	Total	Total*
						Wkrs Administrative	Wkrs Clerical	Wkrs Sales							
															Per cent
															Numbers
MESC**	Natural & Physical Sciences	6	21	23	5	16	3	1	75	3	22	100	1,776		
	Information Technology	7	46	12	10	10	3	1	89	4	7	100	700		
	Engineering and Related Technologies	7	43	22	6	7	3	1	88	2	9	100	1,039		
	Architecture and Building	13	37	15	12	11	0	0	89	4	7	100	288		
	Medical Studies	2	85	2	1	2	0	1	91	1	8	100	389		
	Nursing	0	89	1	0	3	0	0	94	1	5	100	716		
	Balance of Health	4	48	19	1	14	2	0	88	2	9	100	873		
	Education	4	53	5	1	18	2	0	83	3	13	100	1,018		
	Accounting	9	57	22	0	4	0	2	93	2	5	100	692		
	Balance of Business Human Resource and Marketing Profs	17	31	5	2	30	3	1	89	4	7	100	2,642		
	Society and Culture/ Creative Arts	9	9	26	3	31	3	0	82	4	14	100	4,939		
	Total#	9	48		3	21	3	1	85	4	12	100	15,725		
NESC**	Natural & Physical Sciences	2	7	11	5	16	8	1	49	8	42	100	4,463		
	Information Technology	3	18	5	6	23	14	2	71	9	19	100	13,395		
	Engineering and Related Technologies	3	11	14	5	16	14	1	66	9	25	100	8,231		
	Architecture and Building	2	27	6	10	12	7	0	64	8	28	100	1,251		
	Medical Studies	0	40	5	1	7	3	0	58	10	32	100	1,006		
	Nursing	0	53	0	1	14	4	0	73	6	21	100	1,195		
	Balance of Health	1	27	7	2	17	6	1	60	8	31	100	2,216		
	Education	1	14	3	3	20	8	1	49	10	40	100	2,312		
	Accounting	2	18	5	1	31	10	2	69	10	21	100	9,703		
	Balance of Business Human Resource and Marketing Profs	4	9	3	2	31	9	1	59	10	30	100	16,942		
	Society and Culture/ Creative Arts	2	3	9	3	24	8	0	51	11	38	100	10,563		
	Total#	3	19		4	24	10	1	61	10	29	100	74,563		
Australia-born	Natural & Physical Sciences	6	21	21	9	21	4	1	82	3	15	100	27,819		
	Information Technology	7	48	11	12	11	2	2	93	3	4	100	16,285		
	Engineering and Related Technologies	8	49	24	5	6	2	1	94	1	4	100	19,242		
	Architecture and Building	11	47	7	11	13	2	1	92	2	6	100	6,177		
	Medical Studies	1	83	6	1	3	0	0	94	1	6	100	3,314		
	Nursing	1	86	2	0	4	0	0	94	1	5	100	18,368		
	Balance of Health	3	57	14	2	16	1	0	93	1	6	100	24,410		
	Education	2	79	2	0	8	1	0	93	1	6	100	50,122		
	Accounting	6	68	11	0	9	1	0	96	1	3	100	14,382		
	Balance of Business Human Resource and Marketing Profs	18	34	6	1	32	2	1	94	2	4	100	54,882		
	Society and Culture/ Creative Arts	7	21	23	3	33	2	0	89	3	8	100	86,301		
	Total#	8	56		3	21	2	1	91	2	7	100	339,400		

Source: ABS, 2006 Census, customised data set held by CPUR

Total includes the following fields of study, 'Mixed field programmes' and 'Balance of food, hospitality and personal services' (not shown in table).

*Total includes Inadequately described and not stated

** 'MESC' refers to overseas-born persons born in the 'Main English speaking countries: the U.K., Ireland, Canada, South Africa and New Zealand; NESC refers to persons born in Non-English speaking countries.

Table 8 Per cent and numbers of Australia-born and overseas-born persons (who arrived 2001 to 2006) aged 30 to 64 years, with bachelor degree or higher, by field of qualification and job outcomes, 2006

Birthplace group	Field of qualification	Managers	Other Profession and Trades	Technicians and Trades Workers	Community and Personal Service Wkrs Administrative Wkrs	Clerical Sales	Machinery Ops and Drivers	Inad. Descr./Not stated/Not app	Total employed	Unemploy ed	Not in the labour force	Total	Total*
MESC**	Natural & Physical Sciences	18	18	33	4	9	1	1	83	2	14	100	3,716
	Information Technology	17	45	13	5	7	1	1	89	3	8	100	1,996
	Engineering and Related Technologies	25	33	21	5	7	1	1	93	2	5	100	4,252
	Architecture and Building	17	32	19	9	12	1	0	90	2	8	100	873
	Medical Studies	2	81	6	1	1	0	0	92	1	7	100	1,350
	Nursing	3	77	3	0	4	0	0	87	1	11	100	2,989
	Balance of Health	6	45	23	1	8	0	1	83	2	15	100	2,105
	Education	5	50	6	1	11	1	0	74	3	22	100	3,724
	Accounting	28	37	14	1	8	1	1	89	2	9	100	2,327
	Balance of Business Human Resource and Marketing Profs	35	22	9	2	17	1	1	86	3	11	100	6,559
	Society and Culture/ Creative Arts	15	14	27	2	18	2	1	79	3	17	100	10,098
Total#	18	47		3	12	1	1	84	3	13	100	41,236	
NESC**	Natural & Physical Sciences	6	13	20	6	12	7	1	65	7	27	100	6,293
	Information Technology	7	34	9	7	13	7	2	79	7	14	100	6,890
	Engineering and Related Technologies	10	18	19	10	10	10	1	78	7	15	100	11,321
	Architecture and Building	6	28	9	12	10	6	0	72	7	20	100	1,426
	Medical Studies	1	59	7	2	5	2	0	76	6	18	100	4,106
	Nursing	1	62	1	1	10	1	0	76	3	20	100	2,773
	Balance of Health	4	21	16	3	14	5	1	64	7	29	100	3,041
	Education	2	24	4	2	16	7	1	56	8	35	100	5,676
	Accounting	7	28	8	2	23	7	1	75	8	17	100	7,231
	Balance of Business Human Resource and Marketing Profs	14	12	7	3	25	8	2	70	8	22	100	13,914
	Society and Culture/ Creative Arts	7	6	13	3	20	7	1	56	8	35	100	14,645
Total#	8	28		4	17	7	1	68	7	24	100	80,931	
Australia-born	Natural & Physical Sciences	17	20	30	5	12	2	1	86	2	12	100	76,663
	Information Technology	18	42	14	6	8	1	1	91	2	7	100	32,005
	Engineering and Related Technologies	26	30	22	5	6	2	1	92	1	7	100	63,851
	Architecture and Building	18	46	10	7	8	1	1	91	1	7	100	19,861
	Medical Studies	2	84	6	0	1	0	1	95	0	5	100	23,933
	Nursing	5	65	4	1	9	1	0	85	1	14	100	98,419
	Balance of Health	8	48	21	1	10	1	1	89	1	10	100	60,152
	Education	11	59	5	1	8	1	0	86	1	13	100	248,443
	Accounting	22	44	11	1	11	1	1	91	1	8	100	61,900
	Balance of Business Human Resource and Marketing Profs	37	22	10	1	18	1	1	90	2	8	100	139,078
	Society and Culture/ Creative Arts	13	25	24	2	18	1	1	84	2	14	100	246,479
Total#	16	51		2	12	1	1	87	1	11	100	1,116,397	

Source: ABS, 2006 Census, customised data set held by CPUR

Total includes the following fields of study, 'Mixed field programmes' and 'Balance of food, hospitality and personal services' (not shown in table).

*Total includes Inadequately described and not stated

** 'MESC' refers to overseas-born persons born in the 'Main English speaking countries: the U.K., Ireland, Canada, South Africa and New Zealand; NESC refers to persons born in Non-English speaking countries.

Skills for Sustainability

An important area of likely employment growth in coming years will be in environmental sustainability, and specifically the research, development and implementation skills required to reduce Australia's carbon footprint.

The transition to a low carbon economy involves a profound economic change, perhaps one rivalling the Industrial Revolution of the eighteenth and nineteenth centuries in terms of changing scientific and engineering demands and work patterns. Indeed, while the Industrial Revolution took place over 150 years in the West, a Carbon Revolution will need to occur across the world over the next 20 to 30 years.

The low carbon transition will involve all employment sectors, but will particularly demand scientific and technological skills to fully develop:

- renewable energy sources and to adapt existing ones (eg. to develop clean coal)
- urban planning, transport, infrastructure and architecture
- new techniques in building and construction (eg. to maximise the efficiency of materials and energy used in building design, heating, cooling and lighting).
- dry land farming, water management and environmental restoration, and
- the 'soft skills' of assessment, accreditation and accounting crucial to measuring carbon impacts, and to establishing and maintaining markets for carbon pollution trading.

The university sector is central to Australia's climate change response.

Climate change research - about the phenomenon, its potential impacts, and mitigation and adaptation - is core higher education business. The still powerful wells of intellectual curiosity within Australia's universities provide us with one of our best chances to combat dangerous climate change. The sector is likely to be increasingly drawn into various regulatory demands and market incentives that put a premium on developing climate change solutions.

Significant resources and staffing - research leaders, post-graduates and graduates in the physical sciences and engineering, as well as in the economic and social fields – are necessary to ensure the sector takes advantage of these opportunities. New collaborations between disciplines will be required, with environmental sustainability as an underlying intellectual and pedagogical value and reference point. Research, development and innovation hubs involving universities, TAFE and industry will be crucial to identifying, developing and testing the design, technical and practical solutions and adaptations Australia and other countries will need to follow. And finally, the sector is critical to training the new graduates and equipping the existing workforce with the professional and technical skills needed to ensure that a low carbon future will be achieved.

A recent study by CSIRO of future employment trends in a carbon constrained economy found that by 2015 the total number of jobs in the industries that account for around 70 percent to 80 percent of overall carbon emissions and environmental impact, will increase by 335,700 – from 2.9 million to over 3.25 million. And by 2025 they will increase by 558,000 to a total of 3.45 million.^{xiii} These results are

summarized in Table 9, and are derived from econometric modeling which incorporates a target outcome of reducing Australia’s Greenhouse Gas Emissions by 60 per cent over 1990 levels by 2050, consistent with current Commonwealth Government targets.

Table 9: Employment growth in high material flow industries 2005-2015 and 2005-2025 (using CGE deep cuts scenario – reducing Greenhouse Gas Emissions by 60% by 2050)

Sector	Employment increase 2005-2015	Employment increase 2005-2025
Agriculture, fishing & forestry	43,000	70,600
Food & drink	14,100	27,600
Mining & energy commodities	9,500	22,800
Manufacturing, heavy industry & power	33,400	36,100
Transport	79,300	149,700
Construction	145,500	235,000
TOTAL	335,700	558,200

Source: CSIRO, *Growing the Green Collar Economy*, DSF & ACF, 2008

Because of the high greenhouse gas impact of these industries, workers entering these areas will need to work differently and smarter: they will need to be truly post-industrial, ‘green collar’ workers. In key sectors, many workers will be required to combine technical expertise with deeper knowledge of water, power, energy sources and consumption patterns and affect a managerial know-how of how to limit the carbon impact. There is likely to be increasing pressure on our university and TAFE sectors to graduate workers in these sectors with these attributes.

Implications for higher-education policy

The juxtaposition of rapid growth in employer demand for persons with higher-education credentials on the one hand and no significant growth in the number of domestic undergraduates completing courses at this level over the past decade leaves little doubt that the level of domestic higher-education training should be increased. Nor can there be much debate that the scale of this increase should be substantial. The underlying structural changes in Australia's occupation system and tendencies toward job enrichment charted above, both point to this conclusion. The 30 per cent growth in the numbers of persons employed as professionals over the decade 1996 to 2006 (compared with overall employment growth of 19.2 per cent) give an indication of the minimum scale of expansion required.

Table 2, which detailed the number of domestic undergraduate completions in Australian universities over the period 2002 to 2006 showed that it was only in the health and creative arts fields of study that there was any significant expansion in the number of undergraduate completions. For this submission we have not undertaken a new detailed, independent study of likely future employer labour demands. However, government projections indicate there is likely to be a strong demand in the immediate future in the more highly-skilled occupations, particularly in the health professions, accounting, engineering and specialist information and communication technology areas.^{xiii} The present level of university training in the engineering, IT and the business fields, is significantly below the levels likely to be required.

The Review should not just focus its attention on specific vocationally-oriented university courses, however. Our analysis has shown that structural change is favouring service industries, and that job enrichment trends indicate that employers are paying more attention to communication skills. The rapid growth in employment at the managerial level also points to the likely increased importance of analytic and communication skills in the future job market. In these circumstances, it is desirable that there be an expansion in the availability of university places across the spectrum of vocational and less vocational fields of study. The significance of the latter would appear to be growing given the importance of communication and analytic skills.

Nevertheless, parents, prospective students, employers and Australian society through our governments are hardly likely to provide the funds for a major expansion in university places unless they can see some vocational payoff at the end of the process. Students who complete courses in the arts, social and natural sciences need an entry point into the labour market. For this purpose, they often need to take a relevant vocationally-oriented course, whether it be in applied technology, design, finance, health and safety, tourism, or specialist programming languages.

Universities and TAFE institutes need to offer seamless entry into relevant vocational courses. The increased provision of such courses would also be of great value in helping residents from overseas who hold degree-level qualifications, but need to upgrade them (including communication skills where necessary) if they are to obtain professional positions in Australia. For its part, the Commonwealth government should allocate more funds to help universities and TAFE colleges provide the courses and to assist these students taking the courses.

There is also a strong case for closer integration of TAFE programs with university courses. As indicated, TAFE has moved into para-professional and associate professional areas, particularly in the business sector and in service and administrative occupations, where entry at the professional level now requires a university degree. Many of the students taking these TAFE courses could potentially move across to university studies if appropriate. Since there are widespread shortages in some of these professional areas, including accounting, the case for a more open pathway between the two systems is strong. This does not mean that TAFE colleges should necessarily be encouraged to compete at the professional level. There is a strong demand for such qualifications at the para-professional and associate professional level. Rather, the benefit of closer articulation between the two types of education would be that it would open up opportunities for access across the higher education system.

¹ Australian Government, *Review of Australian Higher Education, Discussion Paper*, June 2008

² Bob Birrell, Ernest Healy and T. Fred Smith, 'Labor's education and training strategy: building on false assumptions?', *People and Place*, vol. 16, no. 1, March 2008, p. 50

³ Department of Immigration and Citizenship, Subclass 457 Business (Long Stay) State/Territory Summary Report 2007-08, p. 6

⁴ Bob Birrell, Daniel Edwards and Ian Dobson, 'The widening gap between demand for and supply of university graduates in Australia', *People and Place*, vol. 15, no. 2, June 2007, p. 75

⁵ *Review of Australian Higher Education*, op cit, p.26

⁶ *Review*, op cit, Table 1, p. 27

⁷ Bob Birrell and Daniel Edwards, *Half of Australian youth aged 18-20 are not in training*, Centre for Population and Urban Research, University World News, 12 November, 2007.

⁸ Main-English-Speaking Country birthplaces are defined to include those born in the UK, South Africa, New Zealand and New Zealand. The Non-English-Speaking Country birthplace grouping is a residual category which includes all other birthplaces other than Australia.

⁹ Shah, C and Burke, G, *Qualifications and the future labour market in Australia*, Report prepared for the National Training Reform Taskforce, Monash University – ACER, Centre for the Economics of Education and Training, Melbourne, 2006

¹⁰ *Ibid*, Table 24, p. 26

¹¹ *Ibid*, Table 23, p. 26

^{xii} CSIRO, *Growing the Green Collar Economy*, DSF & ACF, 2008

^{xiii} Australian Government, Department of Employment and Workplace Relations, *Australian Jobs 2006*, p. 20