# Submission to the Review of Australian Higher Education

July 2008



**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.

**Contacts:**

**CPUR – Bob Birrell – 03 9905 2967 - bob.birrell@arts.monash.edu.au**
**DSF – John Spierings – 03 9347 5860 – john@dsf.org.au**

## 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**

| | 2002 | 2003 | 2004 | 2005 | 2006 | Growth 2002-2006 | |
|---|---|---|---|---|---|---|---|
| Major field of study | | | | | | 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 | Diploma | Certificate levels III & IV | Balance of Certificate Level | No post school qual.* | Total | Total* N |
|---|---|---|---|---|---|---|---|---|
| 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 | | | | | | |
|---|---|---|---|---|---|---|---|
| | 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**

| | Bachelor and above | Advanced Diploma and Diploma Level | Certificate III IV | Certificate I II Level | Other Certificate Level not further defined | Not applicable | Total | Total | Bachelor and above | Advanced Diploma and Diploma Level | Certificate III IV | Certificate I II Level | Other Certificate Level not further defined | Not applicable | Total | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 25 to 29 years | | | | | | | | 40 to 44 years | | | | | | | |
| | Per cent | | | | | | | Numbers | Per cent | | | | | | | 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 inadeuqately 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 bourgeoning 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 NESC 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**

| | Bachelor and above | | Advanced Diploma and Diploma Level | | Total | Bachelor and above | | Advanced Diploma and Diploma Level | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | 25 to 29 years | | | | | 40 to 44 years | | | | |
| | 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 no include persons with no post-school qualification and post-school qualification not state or inadeuqately 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 Percent 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 | Professional: Same field | Professional: Other Professionals | Technicians and Trades Workers | Community and Personal Service Wkrs Clerical Administrative Wkrs Sales Wkrs | Machinery Ops and Drivers Labourers | Inad. Descr./Not stated/Not app | Total employed | Unemployed | Not in the labour force | Total | Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Percent | | | | | | | | | | | 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 dn New Zealand; NESC refers to persons born in Non-English speaking countries.

**Table 8 Percent 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 | Same field | Other Professionals | Technicians and Trades Workers | Community and Personal Service Wkrs Clerical Administrative Wkrs Sales Wkrs | Machiner y Ops and Drivers Labourers | Inad. Descr./Not stated/Not app | Total employed | Unemployed | Not in the labour force | Total | Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Professional | | | | | | | | | | | |
| | | Percent | | | | | | | | | | | Numbers |
| 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 |
| | 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 |
| | 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 |
| | 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 dn 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.[12] 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.[13] 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
[12] CSIRO, *Growing the Green Collar Economy*, DSF & ACF, 2008
[13] Australian Government, Department of Employment and Workplace Relations, *Australian Jobs 2006*, p. 20