

# **UNIVERSITIES AND AUSTRALIA'S FUTURE WORKFORCE**

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## **Universities and Australia's future workforce**

It should come as no surprise at a time when Australia is experiencing low unemployment and sustained demand for its products and services that labour shortages loom large in the public eye. Such shortages can arise for many different reasons, including shifts either in the supply of suitably educated and trained people or shifts in the demand for particular types of labour.

Some changes are cyclical in nature, and shortages resolve themselves as signals are sent out (such as in the form of higher wages for scarce labour) and responded to by individuals and systems on the training side. One can see this, for example, in the construction and mining industries, where demand for trade skills fluctuates with the prevailing conditions in those industries. Such pressures are immediate and visible, and receive much attention from governments and players in the vocational education and training system. One might even be forgiven for imagining that vocational skills were the predominant, or even only, area of concern when it comes to skills shortages; see, for example, the Federal Government's website for its National Skills Strategy at <http://www.getatrade.gov.au>.

Of course the Federal and State governments are aware of shortages of skills in professional fields, and some specific actions have been taken in particular areas, particularly in the health field, but the scope for government intervention is much less clear than is the case for shortages needing direct and short-term training. Nor is it clear just what the balance should be between addressing professional shortages – where supply is largely the province of universities – and those of a shorter-term nature. For its part, the Federal Government has suggested that too many school leavers are being groomed for university at the expense of vocational training.

Further exploration of the causes of professional skills shortages, and of the role of universities in dealing with them, requires consideration of longer-term and more fundamental shifts in the Australian labour market. These shifts owe their origin to an interplay of structural changes in the economy, demographic changes, and what might broadly be termed social and cultural changes.

### **Shifts in the economy and demand for higher education**

Over the last few decades Australia's economy has undergone major transformations as result of its exposure to the global marketplace and to the global forces that drive it. While the global free trade agenda clearly has a long way to go in many sectors, Australian industries like those in other developed countries have been increasingly exposed to competition from countries with abundant and relatively cheaper low-skilled labour. Technological advances have reinforced globalisation, by facilitating freer exchange and opening up new opportunities for trade. Technology has also raised productivity by automating various forms of routine work. Taking advantage of technology has also raised the bar in terms of the expectations of workers' skills, with people needing not only to be proficient at operating particular systems but also needing to be innovative and adaptable to regular system changes.

New technology, along with higher incomes derived from the improved productivity that technology has permitted, have also been key factors in the rise of service industries, including high-skill professional services, which have captured an increasing share of the Australian labour market.

The net effect has been a sustained trend away from economic returns to low-skilled work as Australia focuses on comparative advantages in more skill and knowledge-

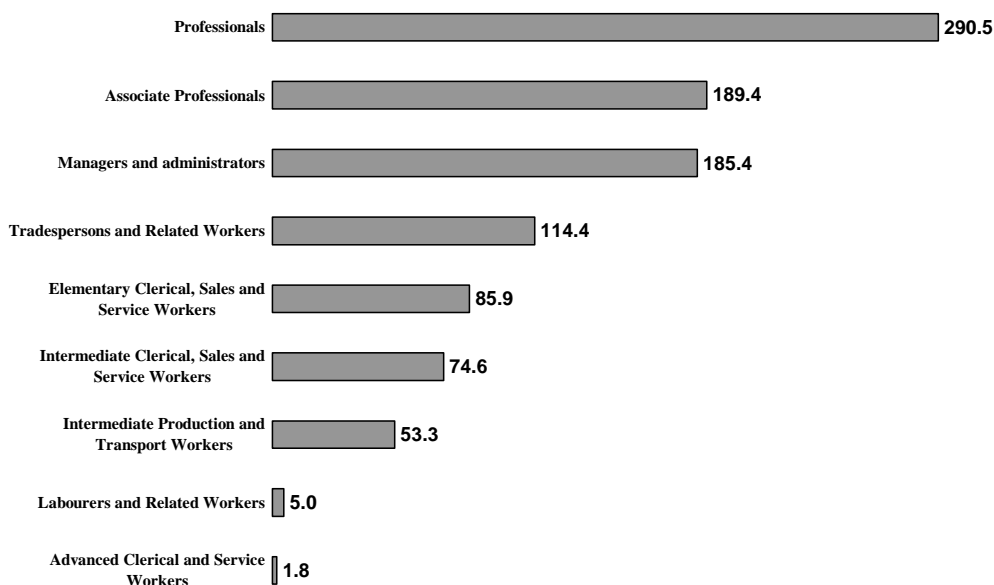
intensive industries. Furthermore, this trend has been towards the higher end of the skill spectrum, providing strong economic returns to university education and increasing the proportion of people with higher education in the workforce across almost all industries. Over the two decades from 1984 to 2004 the percentage of people in the workforce with higher education rose from 9.6 per cent to 22.4 per cent, while the share of people with VET qualifications has remained fairly stable.

Some people argue that much of this growth is ‘credentialism’, whereby employers use qualifications as a sorting device rather than for actual job needs, and consequently we may be over-producing graduates. However, there is little research evidence to suggest that this is a driving factor. In a report prepared last year by the National Institute of Labour Studies, which examined why so many people with VET qualifications were working in jobs that did not use their qualification, Professor Sue Richardson and colleagues wrote:

It is clear that there has been a strong shift in the pattern of labour demand away from vocational qualifications towards university qualifications. People with vocational qualifications have been facing a labour market with a declining (relative) appetite for their skills and a growing preference for university qualifications. This provides support for the view that structural change in the economy is reducing the number of jobs that require or value VET qualifications ... if the growth in supply of highly educated labour has outpaced the growth in demand for their higher skills, we would expect to see a fall in the inequality of the distribution of earnings. This will occur because the competition for high education jobs forces their wages down, and/or because highly educated people have to accept lower level (and pay) jobs. In either case, earnings inequality will fall. This is at odds with what we actually observe for Australia, which is a rise in earning inequality (i.e., growth at the top of the earnings distribution has been faster than at the bottom of the distribution). This piece of evidence casts doubt on the overeducation story.

In fact the fastest employment growth has continued to be in those fields needing higher education.

**Employment Growth by Occupation Major Group  
5 Years to Feb 2006 ('000)**



Source: DEWR Australian Jobs 2006

Similarly, in percentage terms, employment growth over the past five years has been strongest in the most skilled occupational groups, with Managers and Administrators up 28 per cent, Associate Professionals up 18 per cent, Professionals up 17 per cent and Trades up 10 per cent. Wage rates in the occupations needing higher education have continued to rise faster than others. Through the two decades to 2003, people with higher education had lower unemployment rates, were less vulnerable to unemployment during the economic downturn of the early 1990s, and they had a much shorter median duration of unemployment.

## **Shifts in demographics**

Australia's ageing population is by now firmly embedded in public discourse, perhaps most prominently with the first Intergenerational Report in the 2002-03 Budget and the subsequent Productivity Commission report released in 2005.

The short message from these reports is that Australia, like most developed countries, will experience a major increase in the proportion of its population that is over the traditional working age. The main drivers of this ageing are increased life expectancy and, to a lesser extent, relatively lower fertility rates. As a result, there will be significant increases in public costs in areas such as health care and pensions while the ratio of people in the workforce to those aged 65 or more (the age dependency ratio) is expected to halve from its current level over the next four decades. As people age, many drop out of the workforce or shift to part-time, and both aggregate labour participation rates and average hours worked will fall. The decline in participation will pull down per capita income growth outweighing the positive ageing impacts of a rising share of the population of working age (due to fewer young people) and a rising employment rate.

One public policy issue to emerge from this scenario is the financing of the increased public costs associated with ageing. The Productivity Commission examined several options, concluding that while some benefits could come from aiming to increase participation in the workforce, the best course would be to aim for increased productivity – not only overall to provide greater capacity for larger tax revenue in the future but also in the health sector in particular to lessen the main pressure point on future costs. However, for the purposes of this paper, it is the Productivity Commission's conclusions on the demographic impact on the labour market that are of principal interest.

First, while labour supply will grow more slowly as a result of ageing, it will nonetheless grow, and the ratio of employees to the total population will be higher in 2045 than at almost any time in the last century. Second, as noted earlier, specific occupational skill shortages tend to resolve themselves provided there is sufficient flexibility in industry structures and pay rates. The Commission noted that:

ageing may create more enduring shortages in some health care professions, reflecting entry barriers and insufficiently attractive regulated wages and conditions in these areas. But whether temporary or long-lived, such specific shortages do not loom very large for the whole labour market and therefore cannot significantly affect overall participation rates, primarily shifting where people are employed.

Closer attention was paid to a later Productivity Commission report on the health workforce, completed in 2006. In that report several areas of existing shortages were identified, along with projections that demographic, technological and other factors would continue to drive demand ever higher. Meeting such increased demand could become particularly difficult in professional areas such as nursing, where the population profile is significantly older than average, and so demographic pressures will

simultaneously remove significant numbers of workers while raising demand ever higher.

## Responses to shifting economic demand and opportunity

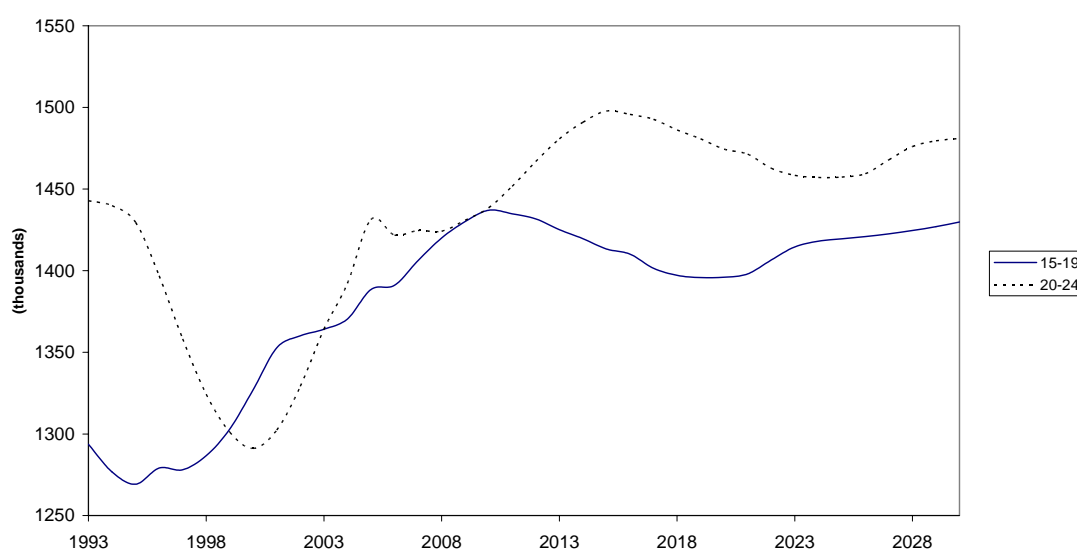
### *Student demand*

As the Australian economy has changed to provide greater rewards to higher skills, the percentage of the population that has secured higher education qualifications has increased. At the time of the 1971 census, 3 per cent of people aged 20-64 years held a higher education qualification. By the time of the 2001 census, this had increased to 16 per cent.

The almost economy-wide increase in demand for university graduates over recent decades has been met by a dramatic expansion in university numbers – in part driven by planned government increases in the availability of places and also by the increase in more market-oriented fee-paying programs, particularly at postgraduate level. For the most part, the match between graduate output and the needs of the economy has been achieved, even at undergraduate level, by responses to shifts in student demand, with a few notable exceptions.

Rapid growth in undergraduate university student numbers was driven throughout the 1980s at the aggregate level by a combination of demographic changes in the school leaver age group, demand for higher education by older workers, increases in secondary school retention rates, and changes in the labour market. In the early 1990s there was a period of economic downturn which sustained growth in demand for university programs despite a decline in retention rates and a fall in the size of the relevant 17-20 year age cohort. Since that time retention rates have stabilised and the 17-20 year old numbers have moved past their mid 1990s dip, and are projected to remain at least at current levels for the next few decades, as shown by Chart 1.

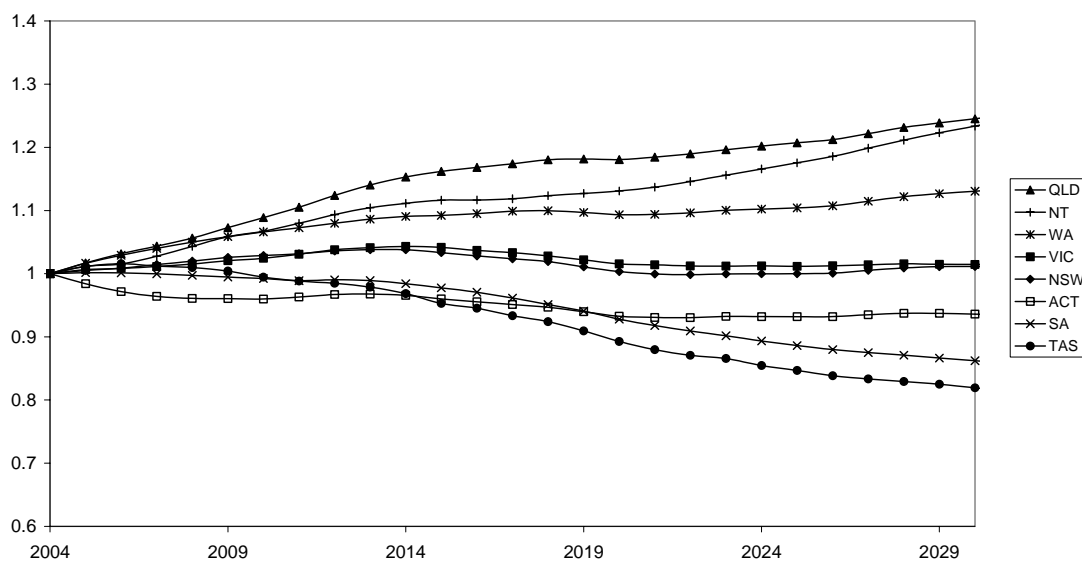
**Chart 1: All Australia: numbers in 15-19 and 20-24 age groups**  
Actual to 2005, Series B projections to 2005-2030



Source: ABS 3222.0

Of course, aggregate numbers hide a wealth of diversity, and the demographics will play out differently around Australia, as shown by Chart 2.

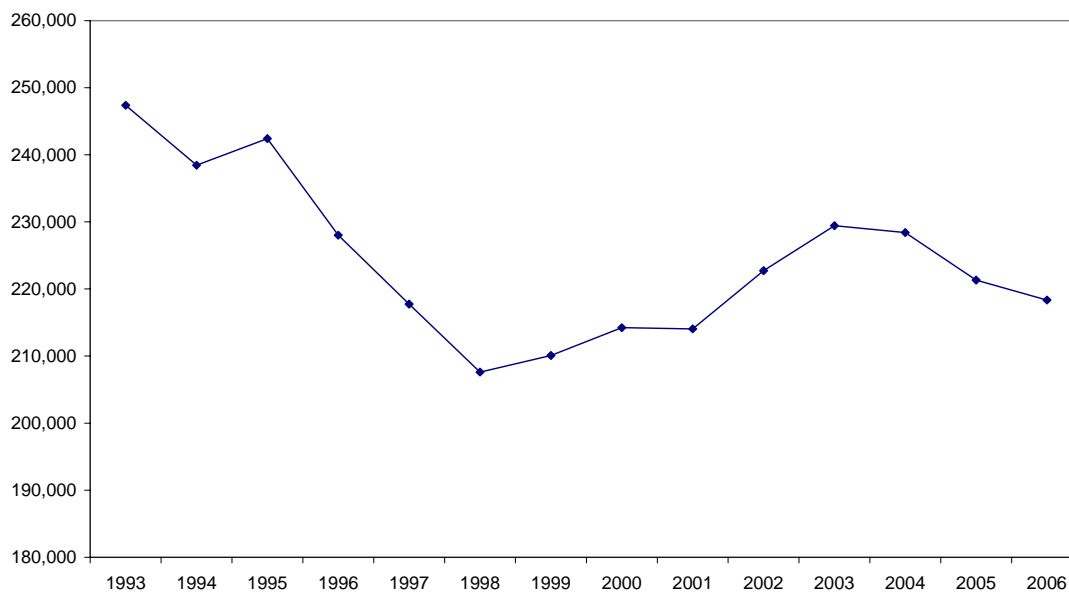
**Chart 2: State/Territory population projections for 17-24 year old age group  
ABS Series B, 2004 = 1.0**



Source: ABS 3222.0

However, it is interesting to compare the demographic changes in the school leaver population over the past fifteen years with the numbers of eligible university applicants.

**Chart 3: All eligible applicants in AVCC survey: 1993 to 2006**



Source: AVCC

It is tempting to link the decline and recovery in school-leaver demographics with the broad shifts in aggregate university demand over the 1990s, but the decline in recent years demonstrates that other factors are at play, not least being the tight labour markets of recent times, which offer increased opportunities and attractions for many young people.

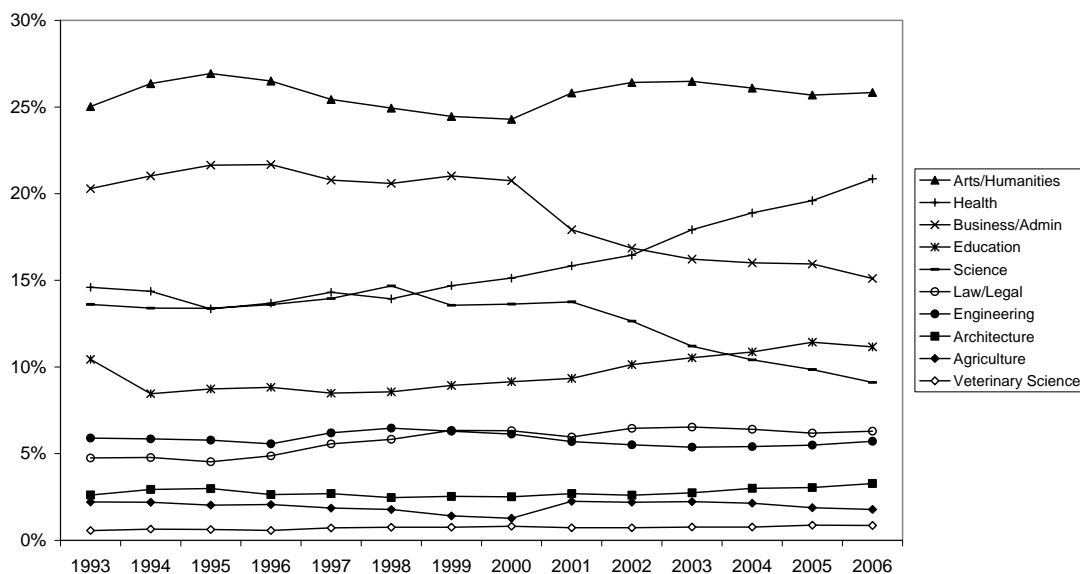
Reference was made earlier to the interplay of structural changes to the economy, demographic shifts and social/cultural changes. The first two have been briefly considered, but social changes are no less significant in shaping the workforce, and in influencing the nature of demand for higher education. There is much that can be said

here, but two points are particularly important for higher education demand. First, higher education has spread much more widely across the gender gap: women have greatly increased their levels of education and participation in the workforce. Also, as more Australians become better educated and prosperous they tend to have higher expectations for their children's education. One can see this also with migrant populations. The economist Max Corden has assembled a fascinating set of data, which illustrate how the education rates for children of some migrant groups are outstripping those of children of parents born in Australia. This being the case, we can expect that there will continue to be underlying social drivers for sustained higher education demand in the future.

What seems not to have changed is the prevailing pattern of educational participation by children from socioeconomically disadvantaged backgrounds, particularly those where aspirations about educational attainment are low. Not everybody has the ability or motivation to go to university, but the existing distribution of higher education certainly does not reflect the true distribution of innate ability among the population. There is no reason to believe that third generation Australians are inherently less educable than people in the United States. One thing upon which many experts agree is that Australia can and should do considerably more to address persistent areas of poor educational outcome, and that the focus should be on how disadvantages are entrenched in school years. Trying to break the cycle of low inter-generational expectations ought to be part of this.

Within these changing volumes of student demand, students' course preferences have remained – at the broad level – mostly stable.

**Chart 4: Eligible applicants: share by field of study**



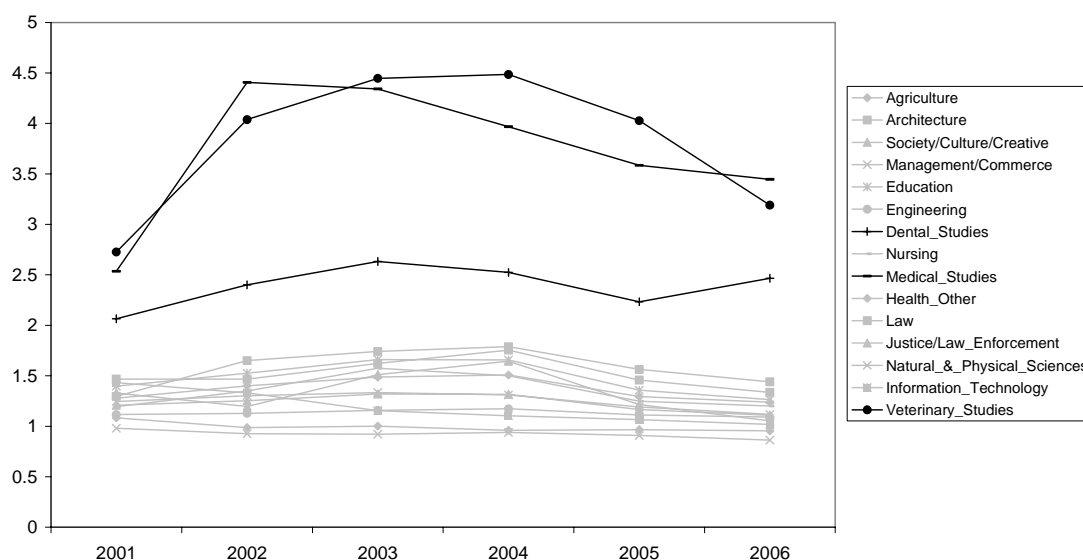
Source: AVCC

Notable exceptions are in areas directly affected by government decisions about supply, particularly in teacher education and in health. The principal areas driving the increasing demand for health are nursing and, to a lesser extent, other allied health fields. Significant declines can be seen for Science (largely due to IT) and business courses. While teacher education and nursing both have attracted special protection from increases to student contribution (HECS), this measure only applied from 2005, well after the rise in demand was evident.

## University responses

These broad shifts, as well as the many more fine-grained changes in student demand over the years among the various universities, pose problems for universities in adjusting the availability of places and particularly in deciding appropriate actions to take when demand declines. Academic organisations require a level of stability to attract people willing and able to pursue scholarly careers, and too precipitate a reaction to declines in demand may risk capacity to respond to any future increases. Nevertheless, financial realities have to be lived with, and the general match of places to demand has remained consistent across the period, again with some notable exceptions.

Chart 5: Ratio of eligible applicants to offers, 2001 to 2006



Source: AVCC data

The ratio of applicants to offers gives some indication of how well the supply of university places has matched student demand. It shows that with the exceptions of Veterinary Science, Dentistry and Medicine, demand and supply are broadly well matched, within a range of 1 to 1.8. This pattern has held for many years.

Over the last five years, both Agriculture and Science have slipped below 1, which suggests that additional places would not find eligible applicants in broad science courses. In general, however, there does not seem to be a problem at the broad level in the allocation of places. Government policy relating to the allocation of new university places is consistent with this view. Their policy has been to provide relatively few new places, and those requiring some evidence of demand and targeted particularly to health. The data also provide little evidence that either government restrictions on the supply of places overall, or the quota system for the allocation of places, have led to overall mismatches of supply and demand, with the exception of particular areas in health.

The supply of university places is not an entirely passive process – demand can and does respond to innovative offerings, and the array of courses available constantly shifts as providers seek out new ways of attracting students. Some universities have also developed tailored education programs for particular professional bodies or corporations. The difficulties such tailored education provides are well known both here and overseas, and one response has been the development of ‘corporate universities’ in the United States. The established processes in Australian universities for award

course development, approval, quality assurance and risk management do not easily fit corporate demands, and there is certainly scope for improving university responsiveness in this area.

However, such non-award activities will remain marginal when seen against the larger canvas of universities' role in supplying skilled graduates. In general there is little evidence that universities are insufficiently flexible in responding to changing student demand at the broad level. When considering potential skills shortages, the place to concentrate on may be instead be the match of student demand to economic need, particularly at the undergraduate level.

### ***Student demand and labour market needs***

The Centre for the Study of Higher Education at the University of Melbourne has conducted a solid body of research on school leavers' choices, noting among things that while students' modes and expectations of engagement with universities are changing, there is little evidence to suggest that students are more vocationally oriented than in the past, or that they have less personal interest in learning about their chosen field. Evidence was also found that, much as we might expect, that students' choice of what and where to study were often not based on objective analysis of available information, but instead involved "chance encounters and questionable sources" while generally relying on cut-off scores as an indicator of reputation and quality.

The point here is that young people may take employment prospects into account when choosing what to study, but many are also driven by cut-offs, thus showing where demand exceeds supply within higher education, as well as by the particular subjects that are of interest to the individual at that time of their life. The connection between employment prospects and course selection is therefore not as strong as some might imagine, and indeed we see from the following table that certain fields of study remain in sustained and in some cases growing demand even while employment prospects are below average.

**Table 1 : Number of domestic Bachelor Pass students by selected field of education, 2002 to 2005**

	2002	2005	Change	FT employment rates in 2000 and 2005
Accounting	15995	12955	-19%	92%, decline by 2005
Architecture	8243	8980	9%	86%, stable in 2005
Business Studies	43574	44891	3%	84%, slight decline by 2005
Chemistry	1017	1000	-2%	74%, improved in 2005
Civil Engineering	4375	4504	3%	93%, up in 2005
Computer Science	31191	21900	-30%	88%, strong decline by 2005
Economics	5160	4560	-12%	86%, stable in 2005
Education Initial	48458	52214	8%	82%, slight decline by 2005
Electronic/Computer Engineering	10684	8213	-23%	92%, decline by 2005
Law	17319	18332	6%	93%, slight decline by 2005
Life Sciences	12427	9655	-22%	68%, stable in 2005
Mathematics	1737	1603	-8%	84%, decline by 2005
Nursing Initial	24041	26562	10%	95%, slightly up by 2005
Other Engineering	21928	23134	5%	86%, stable in 2005
Pharmacy	3297	3856	17%	98%, slightly up by 2005
Psychology	12190	13121	8%	72%, slight decline by 2005
Society & Culture	115602	116081	0%	75%, slight decline by 2005
Visual and Performing Arts	36537	38833	6%	63%, slight decline by 2005
All fields	491247	494926	1%	

Source: DEST Student datasets, Graduate Destinations Surveys

It is clear that while many students are indeed sensitive to the labour market, large numbers of them are also driven by personal interest and other factors. It is also probable that choices for some professional destinations are affected by relatively high levels of skilled migration, which has had a particular impact in areas such as accountancy and information technology. It should be noted that while Table 1 classifies students according to their primary field of education, and double degrees have been growing in popularity, for the most part the percentage changes do not differ when including secondary field of education. The notable exception is Law, where there has been a steep decline in the number of students taking Law as a second subject between 2002 and 2005.

Despite the indirectness of the link between student course choices and labour market demands, the employment prospects for graduates have stayed high. Graduate employment data for 2005 and 2006 show an improvement after falling from a high point in 2000 and levelling out between 2003 and 2004. New bachelor degree graduates found employment more readily in 2006 than in recent years, with 82 per cent of those available for full-time employment finding such employment within four months of graduation.

Of those in full-time employment, around 80 per cent of new bachelor degree graduates work in professional, paraprofessional or managerial fields, with most of the rest working in the broad area of clerical/sales/service jobs, which could include graduate starting positions in the public sector. Such figures are cross-sectional, and do not tell us a great deal about the actual use of graduate skills over a graduate's career, nor should we expect at the university level in particular that undergraduate qualifications should align permanently with careers. "Overeducation" is difficult to measure, and there have been few studies conducted in Australia, and those generally have relied on self-assessment and have not focussed on domestic university graduates. However, available evidence suggests that Australian rates of mismatch between jobs and qualifications are comparable to those found in countries such as the UK and the US, and are a good deal less for higher education than for vocational education and training. One might argue on human capital grounds that having graduates in jobs not strictly requiring their skills may nonetheless have payoffs in terms of productivity or social benefits, but clear evidence one way or another is not available.

Of more concern is the level of underutilisation of qualifications in areas of labour shortage. In Australia, as is the case for several other countries, significant numbers of teachers and nurses have left their profession. It has been estimated, for example, that in NSW alone around 30,000 registered nurses are not working in the profession, and the recent House of Representatives review of teacher education noted high attrition rates of beginning teachers. Clearly there are issues to do with working conditions and rates of pay in nursing and school teaching. However, it is not clear just what incentives would be needed to lure back those who have left those professions, nor as a result whether the existence of such pools of "mismatched" people constitutes grounds for limiting the supply of new graduates.

### **Influencing graduate supply**

Educational institutions need to be responsive to student demand, albeit with some inertia arising from the need to preserve viable scholarly communities, and ensure the relevance of what they offer. Such relevance must fit the appropriate level of education, and for universities it should be interpreted with some breadth, particularly at undergraduate level, where a balance needs to be struck between professional training and wider exposure to theoretical attempts to understand the world.

Universities can also assist in developing education and training fitted to anticipated changes in the labour force. The Productivity Commission's report on the health

workforce agreed that we could not afford to simply produce more doctors, nurses and other health workers without thinking about ways of more productively using people's skills in the health professions. New forms of health work have been proposed to cut across traditional professional boundaries, and in QUT's case we have responded by developing courses such as the Master-level course for nurse practitioners, who can take responsibility for a wider range of functions than those permitted to other nurses. In February this year we produced the first graduates from this program, but it remains small, and our ability to anticipate future workforce needs cannot run too far ahead of progress in achieving structural reform in the health sector.

Universities can also attempt to stimulate demand by raising the awareness of potential students about particular areas where there is a mismatch between current demand and our best assessments of society's future labour needs. For example, the Australian Technology Network of universities has received support from the Federal Government to respond to shortages of engineering graduates by developing a national marketing campaign as well piloting a course aptitude test for undergraduate entry and developing new accreditation mechanisms. Many other universities have examples in other fields which could be cited, some targeted at particular localities, others at particular disciplines.

Recently both the Federal Government and the Opposition have raised the possibility of influencing student choice by marginal changes to the student contribution charges. Given the lack of evidence of sensitivity of demand to the major changes that have been made over the past decade, the prospects for this seem slim, and indeed this should not be particularly surprising since student contribution amounts are small compared to the lifetime benefits of higher education and to the cost of foregoing income while studying. Proposals to reduce or cancel student debt, either by employers or government, may be influential in steering student choices about where to work after graduation, although these are similar to bonded scholarship programs which have had limited success in the past.

The impact of such innovations may be locally important, but particularly during times of low unemployment, attempts to influence the choices and destinations of people within a given supply of places will, in all likelihood, be marginal in overall impact. Increasing places for particular fields of study, on the other hand, except in those areas where supply has been specially limited by government, will soon run up against the problem of insufficient student demand, and so place pressure on entry standards. In such circumstances, the most effective policy responses will depend on attending to the factors that prevail in the relevant profession rather than on the supply of new graduates.

In a speech made late last year, the Secretary to the Treasury, Ken Henry, also pointed out that while government had an important role in ensuring the overall supply of labour and other factors necessary for economic activity - through measures aimed at population, participation and productivity - there were risks in intervening to affect its distribution at a time when capacity is being nearly fully utilised. He made particular reference to the risk of impeding growth by attempting to mount "costly policy resistance" to structural changes in Australia's economy which have been wrought by external factors such as globalisation and technological progress.

In general the role of government in addressing labour shortages from the educational supply side at a time of tight labour markets is principally to ensure that supply can match eligible demand for training. In the medium term this should include focussed efforts to raise the participation in education at all levels by those who have the ability but have had fewer opportunities than others. Intervention in the distribution of education and training, except in a limited number of cases, such as medicine or dentistry, where specific restrictions have been put on places, is unlikely to achieve

lasting impact. This includes efforts to swim against the tide of skills-biased technological change by, for example, acting on claims that too many prospective students aspire to university instead of trades. Professional education requires long lead times, and educational institutions are best placed to respond appropriately to changes in demand within their own spheres of activity.

Of course, governments are employers as well as suppliers, and they experience their own labour shortages. Significant challenges exist for public services in pursuing greater productivity from their workforces while remaining attractive to potential employees.

However, there are indications that in some cases, particularly in health, demographic pressures in particular are likely to drive demand up while over the next decade significant numbers of experienced staff will exit, or at least wind down, from the workforce. There are several policy responses available for responding in such circumstances, one being to pursue more aggressively opportunities for productivity, both those arising from technological change and those which might come from overcoming unnecessary barriers to the best use of people's skills. The health sector encompasses a range of mixes of labour and technology intensity, and the greatest prospects for productivity gain lie in those which are least labour-intensive, or where workforce reform is easier to achieve. On the supply side, provided eligible demand is buoyant then additional education and training places can be made available. However, where demand is harder to materialise – for example in areas such as mental health nursing, or rural health specialties – the solution must lie with efforts to address the cause of low demand, including wage rates.

So far this discussion has been conducted in general terms, looking at aggregated pictures rather than at specific industries or more local contexts. However, there is one industry which underpins the supply of professional labour across the community and which is experiencing its own signs of the confluence of demographics, demand and cultural change. Neglect of these signs could pose serious risks for Australia's future, and it is worth reflecting on the general observations of this first section as they might apply to the academic labour market in coming years.

### **The academic labour market**

More than two decades ago the Commonwealth Tertiary Education Commission noted that the rapid expansion of higher education in the 1960s and early 1970s had led to a demographic bulge in the academic workforce, and that this bulge was concentrated in an age group that would reach normal retirement age some time in the first decade of the 21<sup>st</sup> century. University of Adelaide demographer Graeme Hugo has provided detailed data on this phenomenon, showing that the academic profession has among the most age-heavy profiles of any group in the workforce, and that overall between a fifth and a third of university staff will exit the profession in the first decade of this century. He stated that like other OECD nations, Australia is facing a crisis in the academic staff of its universities over the next two decades.

Confirmation of the international nature of this demographic shock comes from a series of reports highlighting potential imminent problems in academic recruitment in the United States, Canada, the UK, New Zealand, Sweden and a number of other European countries.

However, not all areas within the Australian university system will experience this demographic shift. The bulge is predominantly concentrated in areas such as education, arts and parts of health, and there are significant variations among universities in their age profiles even within the same fields. Research staff tend to be

younger, as are the age profiles of fields of study which arose after the 1980s, such as information technology. Table 2 illustrates this variation by showing the proportion of academics aged over 50 in 2003 in broad fields of study for a selection of five universities.

**Table 2: Percentage of full-time/fractional academic staff aged over 50 years in 2003: selected universities and fields of study**

University and type	% of all FTE aged 50+	% of non-research-only FTE aged 50+	Percentage of FTE aged 50+ excluding research-only (minimum 50FTE only)						
			Science	IT	Health	Law	Society/Culture	Education	Business
A. Go8	32	43	41	23	40	36	51		40
B. ATN	45	51	52		33		47	72	52
C. IRU	38	40	33	42			42	70	31
D. IRU	46	51	58		42		57		36
E. ATN	40	43	54	30	41	32	34	56	45

Source: DEST staff dataset

In the past we have gone through major recruitment challenges in higher education. The rapid and large increases in staff numbers that accompanied the expansion of higher education after 1960 were achieved to a large extent by drawing on overseas applicants, particularly from the United Kingdom and other Commonwealth countries. During the late 1980s concerns were raised that ongoing expansion in the system would create serious academic labour shortages. A 1990 government-commissioned report undertaken by the National Institute of Labour Studies reviewed the data and took a deeply pessimistic view of the sector's prospects for the decade to come. Similar concerns were raised around the same time for the United States. Such shortages did not eventuate either here or in the US. In Australia, the situation was overcome again by immigration, drawing from a wider international pool and assisted by liberalisation of entry requirements, and also by an increase in the number of research student places, although significant numbers of those were taken up by existing academic staff. Another factor was a downturn in the economy in the early 1990s, which aided the relative attractiveness of the academic profession. Funding pressures also forced universities to cater for increased student numbers without proportionate increases in academic staffing. Over the ten years to 2003, academic staff full-time-equivalent levels rose by only 3.6 per cent, while student load rose by 46 per cent.

It is difficult to generalise about the possibility of academic labour shortages arising from the coming demographic shock. Where student demand for particular subject areas is low, universities can take the opportunity to restructure their workforces to ensure their sustainability. Where demand is sustained or increases, the key issues are to do with the availability of suitable quality replacement candidates, and that in turn depends on the relative attractiveness, domestically and internationally, of the university and the academic profession.

While overall student demand, as noted earlier, has declined in recent years, this trend is unlikely to continue. The underlying demographics are strong, particularly for States such as Queensland and Western Australia, and the economic returns to higher education are likely to continue to remain attractive. A growing university-educated Australian-born and immigrant education population should also sustain if not increase expectations about university education for their children. In the UK, the 2007 year has seen a dramatic increase in demand for higher education, including in areas of science and engineering which had been in decline, as is the case in Australia. The underlying reasons for this increase are not known.

As is the case with teaching, nursing and a number of other professions, the relative salary position of academics has been significantly affected by the returns offered to skilled professionals in the wider economy over the past three decades. A report commissioned by DEST in 2005 examined academic salaries relative to average weekly earnings over the period from 1977 to 2002 and found that they had declined across all levels, but with the greatest decline for the most senior academics. A professor's salary, was 3.2 times greater than Average Weekly Earnings (AWE) in 1977 but in 2002, it was only 2.4 times greater. The report also noted that this decline happened rapidly over the 1980s, but slowed from 1990, a point which may well bear on the pessimistic views in the late 1980s about the future of the academic labour market. A more interesting comparison would be with professional salaries; however, these are not readily available before 1997.

Over recent years Australian academic salaries have more or less kept pace with those in other professions, particularly professional positions in the private sector. International comparisons are fraught with difficulties, and international relativities can shift quickly, but the available evidence suggests that while Australian academic salaries are significantly behind those in the US, Singapore and Hong Kong, they clearly exceed those in New Zealand and are broadly competitive with the UK and Canada.

However, universities face fundamental challenges in maintaining broad salary relativities while also attracting the most productive staff. People with scarce skills command higher wages, and such scarcity is particularly prominent in research. While the Federal Government has the stated aim of raising the status of teaching vis a vis research, its continued pursuit of ever greater concentration of research funding has fuelled increasing competition for, and attention on, productive researchers. The Research Assessment Exercise prompted waves of poaching and star recruitments in the UK, and there are clear signs that the Research Quality Framework (RQF) and moves to deregulate industrial relations have provided opportunities for valuable staff to exercise leverage over salary and conditions. This is not necessarily bad for the sector, particularly when highly skilled people are able to be attracted from overseas. However, it does heighten the risk of fiscal unsustainability, particularly when the looming retirement wave will require replacements across the board.

There is much that can, should and is being done by universities to prepare for the future. Workforce planning, particularly for the areas of the university with older age profiles, needs to anticipate as best as possible when retirements might occur and to gauge future staffing needs in the light of anticipated demand and strategic direction. While recruitment at the top receives much attention and resourcing, it is equally important to foster the next generation of academics, and it is often at that early stage of a person's career when critical decisions are made about alternative pathways. At QUT, we developed an Early Career Academic program in 2004 which provides structured and comprehensive programs to develop the skills of new academics, as well as support programs and opportunities to develop strong networking and collaborative relationships. Feedback from initial rounds of this program has been very positive, but resource constraints place limits on how far such initiatives can extend within universities and across the sector.

The principal challenges for the Australian higher education system over the coming decade may be less to do with the supply of academic labour drying up, but more to do with the capacity of Australian universities to attract the best academic talent, particularly at the younger levels. Such talent cannot be solely lured on an individualised basis, by offering expensive packages designed to counter the returns people might attain in the wider workforce. Part of the attraction of a university for productive academics will be the nature of the university community within which they

and their colleagues work, including the nature of university-wide facilities and infrastructure.

Australia's public universities remain heavily dependent upon government funding for their operating purposes. While student contributions have increased, these increases have had little effect on university income since they are for the most part repayments to government. The Federal Government continues to set the price for almost all undergraduate education for Australian students, which represents some 81 per cent of domestic student load.

The price that is set by the government is indexed in line with only the very minimum possible salary movements, which in previous years was based on the Safety Net Adjustment determined by the Australian Industrial Relations Commission and in future will be based on the Australian Fair Pay Commission's process for setting minimum wages. Such a policy locks in a steady erosion of university capacity to meet movements in professional salaries, which have of course been moving ahead of Average Weekly Earnings, and certainly far ahead of the minimum safety net provisions. While some increases to operating grants were provided in the recent Federal reforms, conditional on universities being compliant with government demands for specific governance and industrial changes, these have no guarantee of continuation past three years, and they do not alter the underlying problem.

Universities as trainers of the professionals of the future must be able to offer salaries competitive with the professions if we wish them to provide quality education, particularly in areas of potential skills shortage. The twin strategies of relying on cross-subsidisation from fee-paying programs and looking for productivity gains to bridge the gap are not sustainable. Universities have taken what advantage they can of economies of scale, and to date the deployment of technology has consumed as many, if not more, resources than it has freed up. Longer-term prospects for fundamental change in higher education arising from the use of technology remain as unclear today as they were a decade ago, and the idea that productivity gains can allow universities to remain competitive with the professions can only be sustained by wilful disregard of reality.

The capacity of universities to respond to shifts in student demand and to develop workforces and courses suited to Australia's future needs is further compromised by recent trends to tighten the specificity of public funding. Efforts are being made on the one hand to tie funding as closely as possible to the minimum needed for the delivery of specific courses, even to specific campuses, and on the other hand there is a proliferation of special programs tailored to government preferences. Some of these programs aim to help universities adjust and innovate, but often they involve tight timeframes, unclear criteria and selection processes, and their timing and priorities may bear little relation to local needs. Developing new areas requires substantial investment in infrastructure and up-front costs, and going to government for approval and funding for new initiatives is clearly only feasible in a limited number of areas.

The price set by government for courses is based on their assessment of the situation rather than arising from the interactions between universities and those expressing demand for what they can provide. One problem is that the complexity of the system makes it difficult for government to recognise or acknowledge when quality might be under threat. Quality in university education is notoriously difficult to measure. Student satisfaction scores have remained consistently high despite sharp rises in student : staff ratios across the sector, and the government is quick to point out that funding per student has not declined when measured in terms of its own indexation.

However, government-sponsored quality audits and national data collections can tell us only so much: they are about processes and past performance, and represent poor

approaches to monitoring and responding to chronic underlying problems. The fact that school teacher education courses are not attracting our higher achieving school graduates has attracted considerable attention recently. If current policy settings continue, there is a very real risk that this problem could extend further throughout tertiary education, where competition for highly qualified and able people is not only international but also with the very professions for whom universities provide educated graduates.

Universities play a critical role in meeting Australia's future workforce needs, but they need the capacity to be appropriately responsive and proactive, that is, appropriate to local, national or international circumstances in ways which reflect their multiple levels of engagement with students, the professions and the community. The Federal Minister is right to say that we need diversity in our university system, not least because the jobs of the future will not be like those of the past. However, we cannot shape this necessary diversity by government fiat, rank it into league tables, or force it by clumsy performance incentives which in practice simply reflect and reinforce the status quo. Australia's universities also need to continue to attract high quality academics domestically and from around the world. While 81 per cent of Australian domestic university education has its price set by government, the onus is on government to ensure the system's health, and this will require more than sporadic allocation of additional funding for activities which the Federal Government deems to be of priority or in return for short-term reforms.