Academia's own demographic time-bomb

Graham Hugo

It's no news that Australian academics, like Australian cricketers, are getting older (and perhaps tireder). But the exact dimensions of the sector's staffing crisis haven't been clear. Graham Hugo has been studying the figures in detail, and he suggests that the problem may in fact be worse than has been thought. Around a quarter of the academic workforce will retire in the next decade, and there's a 'lost generation' where their replacements should be.

In 1962 Australia's leading demographer of the time WD Borrie wrote in the predecessor to this journal that:

> simple statistics are fundamental to an understanding of the present and immediate future problems of Australian universities…

He pointed to the approaching tidal wave of baby boomers about to enter universities on the one hand and the meagre numbers of graduates of the last decade who were available to provide the tertiary staff required on the other. The argument here is that over the next decade or so, Australian universities face a staffing challenge of similar dimensions to that of the time when Borrie wrote. However, this challenge is not so much one created by an impending massive increase in the number of students so much as large scale retirement of those who became university staff in the late 1960s and 1970s. Moreover, whereas the pressure of the 1960s and 1970s was partly relieved by extraordinary efforts to recruit teaching staff from foreign nations, especially the United Kingdom, the contemporary global labour market in academics presents a quite different context. This paper first outlines the age structure of Australia's university academic employees, which is a significantly older one than that of the total population. It then and finally discusses some implications of the changing demography of the academic workforce.

Some data considerations

There are two main sources of data on the Australian academic workforce. Each university maintains detailed data on its academic and general workforces and reports regularly on this to the Department of Education, Science and Training (DEST). These data are maintained for predominantly administrative purposes and often are not maintained in a way which is amenable to demographic analysis. Their detail on the tenure, rank, length of service, fraction of time, etc. permit detailed analyses of trends and emerging issues and problems but there are difficulties in deriving a definitive national overview from these data. It is hoped that over time this will be possible.

The second source of information is that collected in the quinquennial national censuses of population and housing. The Census (ABS 2001) collects data on industry and occupation of all persons in the workforce. In this paper, people employed in the higher education sector are examined and their occupation characteristics are used to identify the academic part of that workforce. In this study we distinguish between two types of academics – those involved in teaching and non teaching academics (who are predominantly researchers since administrators are given separate occupational categories).

The census data are useful because they are national in their coverage and consistent in the definitions used from census to census. Moreover, the Australian census is one of the most accurate in the world and also one of the most comprehensive with a 1.8 percent undercount being estimated from the 2001 census (ABS 2003a). However it does not have the nuances of detail such as tenure, fraction of time, level, etc., that is available in individual university data. Nevertheless, they give a realistic indication of the main demographic trends in the Australian academic workforce.

The changing size of the Australian academic workforce

Measuring changes in the academic workforce over time is made difficult by inconsistencies in the data collection but also different practices in the appointment conditions and time commitment of staff in universities. Perhaps the most consistent data are those collected from universities by DEST and although the data presented below take no account of the balance between part and full time employees, Table 1 indicates the growth which occurred in the total academic workforce of Australian universities according to the DEST data since 1991. This indicates that over the 1991–2003 period, the academic staff of Australian universities increased by 20.5% although the increase among contract staff (33.3%) was significantly higher than among tenured staff (13.1%). It will be noted however, that the increase in staff was considerably faster in the early part of the period.

Table 1: Number of Academic Staff in Australian Universities, 1991–2003

	Tenured		*Contracted*		*Total*	
Year	*No.*	*Annual Rate of Change*	*No.*	*Annual Rate of Change*	*No.*	*Annual Rate of Change*
1991	18,852		10,982		29,834	
1996	19,320	0.49	14,112	5.14	33,432	2.30
2001	20,271	0.97	13,209	-1.31	33,480	0.03
2003	21,314	1.01	14,642	2.08	35,956	1.44

Source: DEST unpublished data

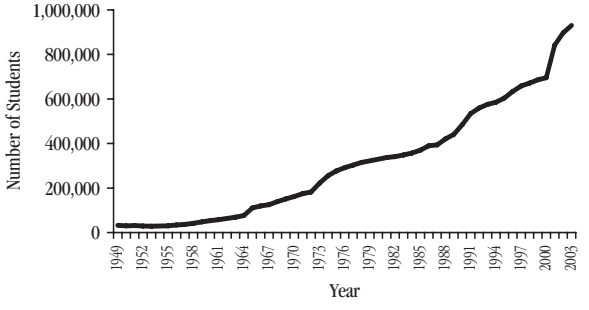
Turning to Australian population census data, Table 2 indicates the changes which have occurred in the numbers of university staff. There are problems over time in obtaining comparable data. However, the patterns depicted are interesting. There was very rapid growth in the 1960s and early 1970s and this was continued in the 1970s and 1980s. Accordingly, Table 2 shows that Australian university teaching staff increased from 13,935 in 1976 to 22,707 a decade later. This is consistent with the rapid growth in student numbers evident in Figure 1. The growth in both students and teaching staff increased in the 1986–91 intercensal period but while the number of students continued to grow apace that of academic staff slowed down considerably. This has been a period of substantial change in the way the university system has operated. It has seen the introduction of a managerial model of administering the universities, which has seen an expansion of the administrative staff and an emphasis on increasing the number of students taught per staff member. The former trend is evident in Table 2, which indicates that the total professional staff of universities increased considerably faster than the teaching academics. Of course the total professional staff includes full time researchers but it does point to the expansion of the administrative staff of universities.

Table 2: Australia: Number of University Academic and Professional Staff, 1976-2001

	Teaching Academics		*Total Professional Staff*	
Year	*No.*	*Annual % Change*	*No.*	*Annual % Change*
1976	13,935	–	na	–
1986	22,707	5.0	na	–
1991	29,008	2.5	na	–
1996	32,210	1.1	44,871	–
2001	32,217	–	52,098	3.0

Source: ABS Australian Censuses of Population and Housing

Figure 1: Australia: Higher Education Students, 1949–2003
Source: DETYA 2001 and DEST 2004



Note: Figures for 1949–1964 are for universities only.
Figures for 1965–1989 include universities and Colleges of Advanced Education.
Includes government Teachers Colleges from 1973 onwards.
Includes non-government Teachers Colleges from 1974 onwards.
Figures for years from 1985–1993 progressively include State-funded basic nursing students who would previously have been trained in hospitals.
In 2001 the scope used to define the data changed to include students enrolled at anytime within the 12-month period 1 September to 31 August. Previously, data referred to students enrolled at 31 March of the stated year.

There is little doubt from both sets of data examined here that there has been a leveling off in the numbers of academic staff in Australian universities, especially those involved in teaching. Table 2 shows that after two decades of growth, the number of university teachers failed to increase in the 1996–2001 intercensal period. On the other hand, the number of doctors increased by 8.4%, lawyers by 22.9%, schoolteachers by 8.7%. Table 3 indicates that using DEST data on the numbers of students and staff there was an increase of 46.5% in the student staff ratio between 1993 and 2003.

In summary, there was a period of very rapid increase in the number of academic staff in Australian universities, especially in the late 1960s and 1970s and early 1980s. The staff recruited were overwhelmingly young and in the early stages

Table 3: Ratio of Students to Academic Staff, 1993–2003

Year	*Students per Aca. Staff*	*Year*	*Students per Aca. Staff*
1993	14.2	1999	18.3
1994	14.2	2000	18.5
1995	14.6	2001	19.1
1996	15.6	2002	20.2
1997	17.2	2003	20.8
1998	17.9		

Source:DEST data from Australian Vice-Chancellors' Committee bttp://www.avcc.edu.au/documents/publications/stats/Staff.pdf

of their careers. However, the last 15 years has seen a considerable slow down not only in the growth but also in recruitment of academic staff. To some extent the current level of zero net growth is masking the effect of substantial redundancy programs which have seen the replacement of older staff with younger staff, but the reality has been that the increase of teaching workloads by a third in the 1996–2003 was the main factor which explains the lack of net growth in the academic workforce.

Ageing of the academic workforce

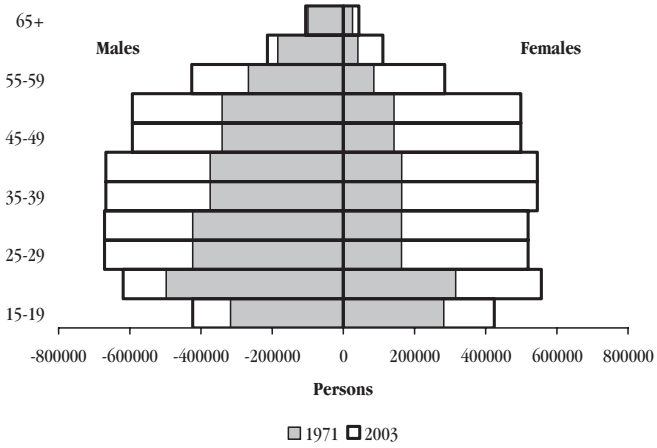
Ageing of the Australian population has become an issue of substantial national significance especially with the Federal Treasurer's *Intergenerational Report* (Costello 2002; 2004) drawing attention to the closing gap in the ratio of working age to retiree populations. One dimension of this is the ageing of the national workforce and Figure 2 shows the massive changes, which have occurred in the age and gender structure of the Australian workforce over the last four decades.

It has not only grown by 141.3% between 1961 and 2003 but in 1961 only 25.1% of the workforce were women whereas in 2003 they made up 44.5%. At the end of World War II, Australia's workforce was a relatively mature one with a median age of 37.1, but 60.3% were aged below 40 years of age. The postwar baby boom and high levels of immigration saw the median age of the workforce decline to 34.1 in 1981 but it then began to increase and rose to 38.4 in 2001 and it will continue to increase.

Turning to the academic workforce, the rapid expansion of universities in the 1960s and 1970s involved a significant recruitment of young academics aged in their twenties and thirties, many of them recruited from overseas, especially the United Kingdom. Accordingly, the Australian academic workforce in the 1970s was an extremely young one as is evident in Figure 3, which shows the age structure of Australian university lecturers and tutors at the 1976 population census.

The rapid influx of young academics into the Australian university system in the 1960s and 1970s followed by a period of slow growth in the number of academic jobs due to demographic and management shifts has produced a high

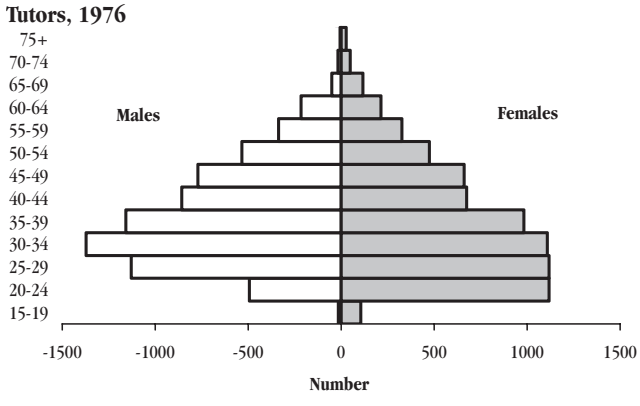
Figure 2: Age-Sex Structure of the Workforce 1971 & 2003



Source:ABS 1971 Census and ABS 2003b

degree of 'age heaping'[1] in the Australian university teacher workforce. Accordingly, Figure 4 shows that the Australian university teaching workforce is concentrated in the older age groups more than not only the total workforce but also the total professional workforce. Despite an improvement over earlier years, it is still evident that women are still under-represented in the workforce. The differences are apparent in Table 4, which shows that only a third of lecturers and tutors were aged under 40 in 2001 compared to half of the total workforce and half of professionals. Even 40% of doctors were aged under 40 years and doctors are the next oldest group to university lecturers among professionals. It will be noted in Table 4, that among information technology (IT) professionals, more than two thirds are aged under 40 years. The table also indicates that the total academic workforce is significantly younger than the lecturer/tutor workforce reflecting the growth of the fulltime and other research staff in Australian universities. There are also some substantial gender differences as Table 5 indicates. Among the older lecturing staff, there are four men for every woman aged over 55. The improvement in gender balance, with decreasing age, is evident in the fact that among

Figure 3: Australia: Age-Sex Structure of University Lecturers and Tutors, 1976



Source:ABS 1976 Census

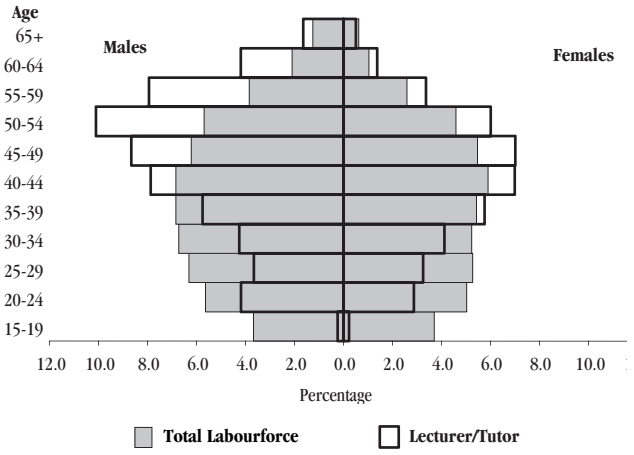
lecturers aged less than forty, the sex ratio[2] was 110.8. The gender ratios are lower among the total academic workforce. The improving gender balance over time is evident in all professions so that there are more female professionals aged less than 40 than males. Even among doctors and IT professionals, where the sex ratios are most imbalanced, there has been an improvement over time.

The last decade has seen an unprecedented effort by universities to offer redundancy packages to older academic staff in a push to increase student/staff ratios, reduce the number of higher level academic staff and to reduce the overall costs of the academic teaching workforce. Nevertheless, between the 1996 and 2001 censuses, there was an increase in the ageing of the academic workforce. This is apparent in Figure 5 where the 1996 and 2001 age pyramids of lecturers and tutors have been overlain. It will be noted that there was a higher proportion aged 20–24 in 2001 than in 1996 reflecting some increased recruitment. However, it will also be noted that there was an increase in the proportion aged over 50 as the ageing of the academic workforce continued.

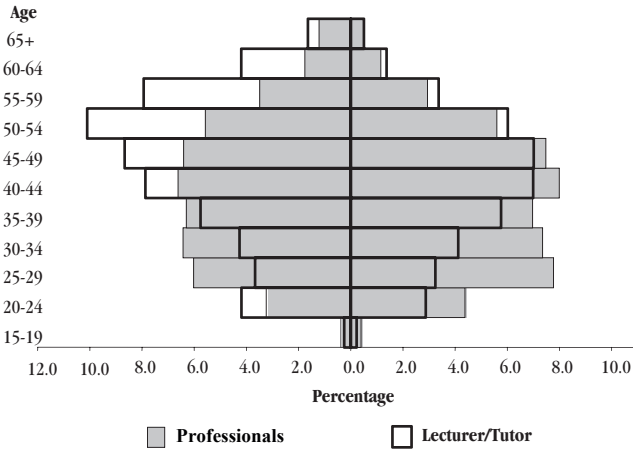
The same patterns of ageing in the academic workforce reflected in the census data examined above are evident in DEST data. Hence, Figure 6 overlays the age-sex structure of the Australian academic workforce in 1991 with that of 2003. It is clear that there has been an ageing of the academic workforce. Over the 12 years there was an increase of 78.5% in academic workforce aged over 50 while the numbers aged under 50 remained virtually static.[3] The percentage of the workforce aged over 50 increased from 26% in 1991 to 38.5%

Figure 4: Age-Sex Structures of Academic Staff and the Australian Workforce and Academic Staff and Professionals, 2001

All workforce and lecturers/tutors



Professionals and lecturers/tutors



Source: ABS 2001 Census

Table 4:
Australia: Percentage of the Workforce by Age Groups, 2001

	All academics	*Lecturers and tutors*	*All workforce*	*All prof'nls*	*Doctors*	*IT prof'nls*
> 55 yrs	15.7	19.0	11.5	11.1	20.1	3.6
> 45 yrs	44.5	51.2	33.4	36.3	45.2	18.7
< 40 yrs	40.8	33.8	53.8	49.3	39.5	67.7

Source:ABS 2001 Census

Table 5:
Australia: Sex Ratio of the Workforce by Age Groups, 2001

	All academics	*Lecturers and tutors*	*All workforce*	*All prof'nls*	*Doctors*	*IT prof'nls*
> 55 yrs	229.2	259.2	169.5	140.3	566.1	559.6
> 45 yrs	156.7	175.7	133.7	104.3	350.0	447.7
< 40 yrs	106.3	110.8	118.4	83.4	130.4	336.9

Source:ABS 2001 Census

Figure 5: Australia: Age-Sex Pyramids of Lecturers and Tutors, 1996 and 2001

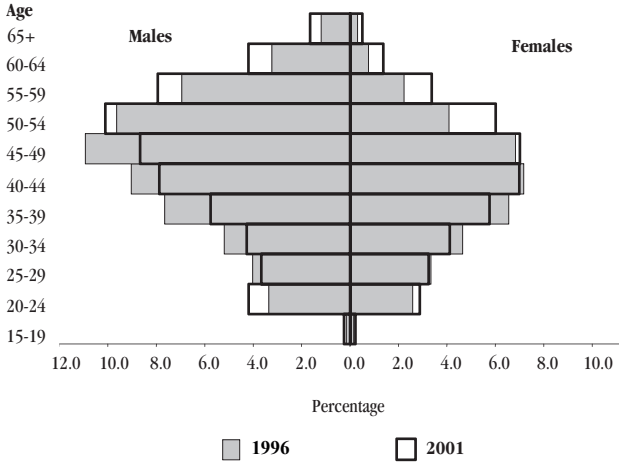
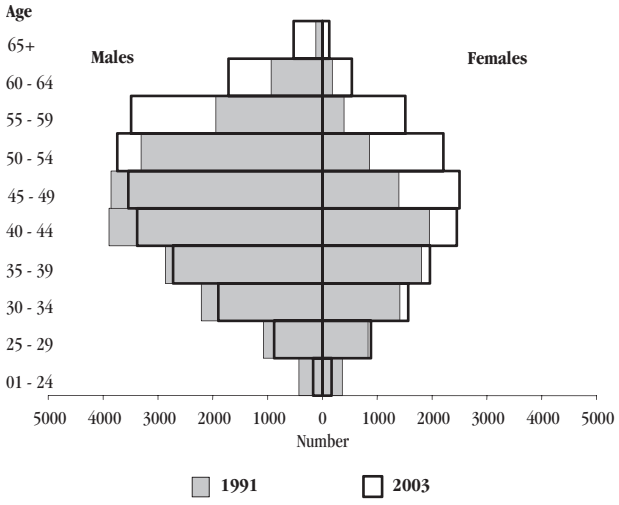
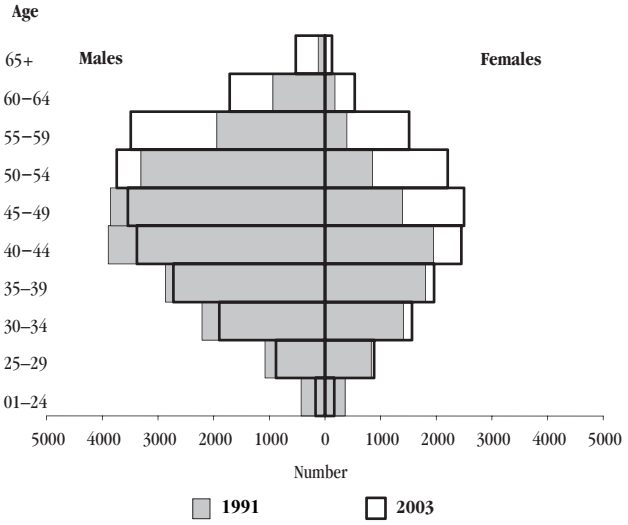


Figure 6: Australia: Academic Staff, Age Sex Structure, 1991 and 2003



Source:DEST, unpublished data

Figure 7: Australia: Academic Tenured Staff, Age Sex Structure, 1991 and 2003

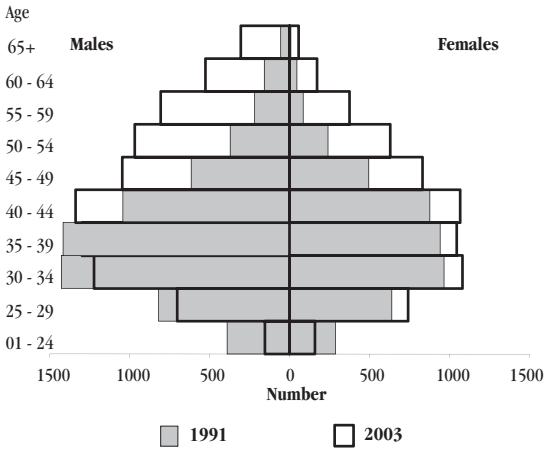


Source:DEST, unpublished data

in 2003. Figure 7 and Figure 8 compare the patterns for the tenured and contract staff. It is apparent that the tenured staff is somewhat older than the contract staff although both have aged over the period. The percentage of the tenured staff aged over 50 has increased from 34.9 in 1991 to 47 in 2003 while among contract staff the increase was from 10.8 to 26.2%.

In summary there are four defining elements of the contemporary Australian academic workforce – slow growth, age heaping, a mature age structure and an imbalanced gender ratio. It is growing at a substantially slower rate than other professions. Age heaping can be a problem in any workforce since it produces problems of succession and continuity in a

Figure 8: Australia: Academic Contract Staff, Age Sex Structure, 1991 and 2003



Source:DEST, unpublished data

workforce. The academic workforce in Australia has a more pronounced heaping than almost any major group in the national workforce. Clearly too, the academic workforce is older than most other groups and this, in itself, means that it is likely to experience a period of substantial loss of workers through retirement over the next decade. Thirdly, despite improvements in the balance between genders, the Australian academic workforce is still one of the least balanced between males and females.

Discussion

Australian universities face many challenges over the next decade, but that presented by academic staffing must rank as one of the greatest. The fact that universities are likely to lose between a fifth and a third of their staff in the next decade or so means that there are major opportunities for restructuring and changing the balance between courses, subjects and teaching and research programs without resorting to large numbers of redundancies. On the other hand, there are real challenges in being able to attract high quality staff members to replace those being lost.

It would seem from the age pyramids presented here that there has been a 'lost generation' of potential university academics, those currently aged in their 20s and 30s. A comparison of the age pyramids shows that Australian academics aged in their 40s and 50s outnumber those in their 20s and 30s by 31.1%. There is no extant research as to why this younger generation of academics have been lost and the extent to which it has been due to factors such as a decline of attractiveness of academic positions, salary, conditions, etc. and the extent to which alternative sectors have been more attractive. Moreover there is an international dimension. In the

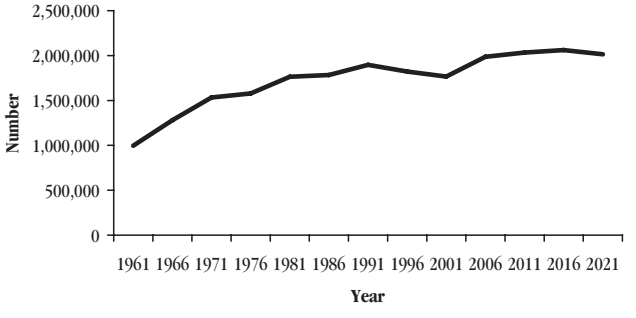
last decade there has been an unprecedented internationalisation of the academic labour market. International competition for highly skilled professionals including academics has never been more competitive. Australia must compete not only for potential academic staff from other countries but also for Australian graduates who are increasingly examining options in foreign universities. It has never been easier for highly skilled Australians to move to positions in foreign countries, especially other OECD nations. Countries have modified immigration regulations to facilitate the recruiting of the highly skilled, researchers, scientists and technologists. The academic labour market is truly internationalised. Elsewhere we have examined the movement of academics to and from Australia (Hugo forthcoming).

While we have concentrated here on the demography of university academic staff it is important to point out that there is no demographic reason to anticipate a decline in the numbers of students in universities over the next two decades. Putting aside important issues of increasing participation in tertiary education, increasing mature age entry and the fact that Australia takes more foreign fee paying students pro rata local university students than any other OECD nation, there will be no major decline in Australians in the 18–24 ages over the next two decades. Indeed, Figure 9 indicates that these prime university age groups will increase sharply between 2001 and 2006 and continue to grow until 2016. This is the impact of the children of the younger postwar baby boom cohort entering these age groups.

In the last decade redundancy programs have been a major element in the human resource policies of several Australian universities. However, it could be argued that the policies of the next two decades will need to concentrate on three other "R's" – Retention, Recruitment and Return.

A clear implication of the trends examined here is that Australian universities need to look at ways to retain high quality staff. This applies cross the board but one group undoubtedly are productive older staff in their 50s. Most universities know little about the retirement intentions of this group. It is clearly in the interest of universities to extend the age at retirement of many of its staff, in particular, those who continue to achieve at a high level. In universities as in many areas there is often a prevailing view that younger staff purely by virtue of age are more productive, innovative and more up to date with current developments in their disciplines. However, it is clear that while it is highly desirable in any academic group to have a balance between staff with respect to age it could prove just as problematical to have age heaping in younger groups as in older age groups. This is true in both the teaching and research endeavors of universities.

Figure 9: Australia: Population Aged 18-24, Actual 1961 to 2001 and Projected 2006 to 2021



Source:ABS Censuses, 1961 to 2001 and ABS Projections, Series B

One feature of Australian universities in recent years has been the substantial increase in average teaching loads. It may well be that this has been possible because of the highly experienced teaching workforce in Australian universities over this period. It could also be that replacing the teaching contribution of a retiree with decades of experience with a recent graduate may present difficulties. In short, a great deal of care needs to be taken with respect to developing policies in relation to the retirement of older staff. In Australia there has, in the past, been a focus on moving older staff out of the mainstream of universities although mentoring and emeritus positions are certainly increasing. Universities should be identifying their older staff who are high performers in research and/or teaching and ensuring that they do not leave the workforce prematurely. The Australian government has recently moved to encourage older workers to stay in the workforce and universities need to move in innovative ways in areas of retention of high quality staff of all ages and in phasing of retirement.

Gender is another important issue in consideration of Australia's future academic staff. Although there have been improvements in gender ratios in Australian universities women are still under-represented, especially at higher levels in the university. This issue has been investigated in some detail in Australian universities and the disadvantages facing women in academic jobs are well known. (Probert 1999a, b, c and d). Nevertheless, despite special initiatives in many universities, inequalities remain. The present demographic analysis would indicate that while the gender equity argument alone should be sufficient for universities to develop programs to ensure that women get equal access as men to all aspects of academic life, it is clear that impending labour market deficits make it even more imperative that universities involve women to a much greater extent than in the past purely from the perspective of the need to recruit sufficient high quality academics to replace the expected loss over the next decade.

Retention of staff will be more difficult over the next decade or so than it has been in the past. With the tightening of the labour market, high quality early career academics will

not only consider academic positions in the various Australian universities when weighing up their working futures but positions outside the academic sector and in overseas academic institutions where salaries, research funds and work conditions are often better.

The second "R" refers to recruitment. A main strategy whereby Australian universities overcame academic staff shortfalls created by the rapid increase in student numbers in the 1960s and 1970s was to seek and recruit staff from overseas, especially the United Kingdom. Elsewhere (Hugo forthcoming), the current patterns of movement of academics to and from Australia are analysed. This indicates that while Australia experiences a net immigration of academics there are some issues of concern, which would suggest that Australia would not be able to compete as effectively for foreign academics as it did in the previous period of shortage of academics. Some of the main issues in this respect are as follows:

- An analysis of incoming and outgoing academics over the 1993–04 and 2002–03 period showed that while there were significant numbers of academic permanent migrants coming to Australia from 'traditional' nations such as the UK and the USA, there was also significant outmovement to these destinations so there was only a small net gain. On the other hand, the net gains from Asian nations such as India and China have been substantial.
- There are many more academics coming to Australia under the new temporary migration categories (Hugo 1999) than are arriving as permanent settlers indicating that much of the movement is to short term non tenured positions.
- Australia may be less able to compete for foreign academics in traditional European and North American nations than it was in the 1960s and 1970s because of salary levels, changing value of the Australian dollar, employment conditions and availability of research resources.
- While there is no doubt there is a net gain of academics to Australia through immigration, this is not just a numbers exercise. While we currently lack empirical verification, there would be concern if Australia was losing the 'brightest and the best' of home grown academics and receiving those with lesser achievements (Wood et al. 2004).

There is no doubt, recruits of overseas academics must be an important strategy for Australian universities over the next two decades but it will involve quite different approaches than those used previously.

A third, less obvious strategy relates to Australian universities benefitting from developing policies toward the national academic diaspora, particularly that part of it which includes their former students and staff. They represent an important part of Australian universities' social capital and an important source of potential future staff. Australia has a diaspora of around 1 million people and academics, researchers, scientists and technologists are an important part of it (Hugo, Rudd and Harris 2001; 2003). There has been an increasing flow of Australian academics to foreign universities and research institutions. This in many ways is a healthy part of our university system in a globalising world and international mobility between universities is a longstanding practice. The scale of this mobility out of Australia is currently at record levels, although in numerical terms, it is more than counterbalanced by an inflow of immigrant academics (Hugo forthcoming). The Australian academic diaspora represents a potential source of recruits at a time when Australian universities are facing their greatest recruiting task for three decades. Some are not intending to return because of a perception of a lack of comparable opportunity in Australia (Hugo forthcoming). However, others are prepared to forgo this and are keen to return, largely for family and lifestyle reasons. However, research suggests that such intentions often do not result in people returning but that the intention can often be turned into action if people receive a specific job offer. There also undoubtedly are ways in which the life of Australian universities can be enriched by engaging the diaspora in research and teaching activities while they are still living overseas (Hugo, Rudd and Harris 2003).

Conclusion

Australian universities over the next decade will be faced by their largest recruitment task for three decades. This task will have to be addressed in a context of the most competitive international labour market for the skilled academics, scientists, technologists and researchers that has ever existed. If Australian universities are to maintain their current levels of excellence, let alone enhance them, a range of innovative human resource strategies will need to be initiated. This will include a judicious mix of strategies which might include among other things – new blood programmes, early recognition of new talent, family friendly policies (especially for women), 'bringing them back' programs to repatriate former staff and students of the university, developing joint international exchanges in teaching and research, incentives to keep 'high fliers' in the university, gradual retirement programs for selected staff and accelerated promotion for key staff.

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Endnotes

1 The concentration of people into a narrow range of age groups.

2 Males per hundred females.

3 Australian Bureau of Statistics (ABS) 1997, Australian Standard Classification of Occupations, Second Edition, Catalogue No. 1220.0, ABS, Canberra

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