The 2008 Graduate Pathways Survey: Graduates' education and employment outcomes five years after completion of a bachelor degree at an Australian university

Report to the

Department of Education, Employment and Workplace Relations (DEEWR)

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April 2009

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EXECUTIVE SUMMARY

A new perspective on graduate outcomes

The development of a strong and vibrant knowledge economy is linked in direct ways with successful outcomes from university education. To advance understanding in this area, the Australian Council for Education Research (ACER) was engaged by the Department of Education, Employment and Workplace Relations (DEEWR) in May 2008 to investigate graduates' education and employment outcomes five years after completion of a bachelor degree at an Australian university.

The 2008 Graduate Pathways Survey (GPS) is the first national study of its kind in Australia. The project required design and development of a robust and efficient national data collection. The Graduate Pathways Questionnaire (GPQ), the GPS survey instrument, captured information on respondents' demographic characteristics and bachelor degree(s), and on their education and employment activities in their first (2003), third (2005) and fifth (2008) years after graduation.

All Table A higher education providers (with one exception) as well as Bond University and the University of Notre Dame participated in the project. Between July and October 2008, survey materials were mailed and where possible emailed to all domestic residents completing a bachelor degree in 2002. A total of 9,238 graduates returned a usable response representing a response rate of around 12 per cent. As this was the first collection of its kind in Australia, an integrated series of quality checks were conducted to ensure the veracity of results.

Employment outcomes

The nature of contemporary work means that graduates can take a few years to establish their careers. Participation in paid work among graduates increased over the five years following graduation. Rates rose from 84 per cent to 91 per cent between the first and fifth year, with rates of part-time work decreasing from 24 per cent to 16 per cent and rates of full-time work increasing from 60 per cent to 75 per cent. Males were more likely than females to be participating in the workforce after five years, particularly in full-time work. Nationally, 84 per cent of males were in full-time work compared with 69 per cent of females. Undertaking paid work during study appeared to have a positive influence on vocational outcomes.

The salaries of graduates also rose between the first and fifth year: at the national level, the median graduate salary rose from $38,000 to $60,000 – a 58 per cent increase. The salary for the middle fifty per cent of graduates five years after graduation ranged from $47,726 to $78,000, comparing favourably with the Australian Bureau of Statistics estimate of average earnings of $46,332 for all workers in Australia. After taking into account factors such as age, work hours, industry, occupation, current study and field of education, males were estimated to earn around $7,800 more per year than females in the fifth year after graduation.

Impact of field of education

Graduate outcomes and pathways varied for different fields of education, with some graduates taking longer to settle into their careers. For example, graduates from the fields of health, education, and architecture and building had rates of participation of at least 90 per cent in both the first and fifth year after graduation. On the other hand, science graduates had the lowest proportion participating in paid work in the first year after graduation (67%) but had largely caught up after five years (85%). There were also differences in the incidence of part-time work across fields of

education, with graduates from the creative arts, society and culture and health fields reporting the highest rates of part-time work in year five.

Similarly, graduate pathways were more diverse for some fields of education compared with others. Graduates' participation in further study was higher for some fields of education compared with others. In the first year after graduation science graduates had the highest rates of further study (60%) followed by society and culture graduates (49%), while education (21%) and architecture and building (21%) graduates had the lowest rates of further study. In the fifth year, health graduates had the highest rates of participation in study (45%) while education (28%) and architecture and building (25%) graduates remained the fields with the lowest rates of further study.

The destinations of graduates are also more diverse for some fields of education. Graduates from the more vocational fields of education of architecture, health and education are more likely to work in specific industries. Conversely, science, IT, engineering, agriculture, management, humanities and creative arts graduates are more likely to be working across a range of industries. Five years after completion, 85 per cent of education graduates worked in the education industry and 80 per cent of health graduates worked in the health and community services industry. By contrast, in year five information technology graduates were spread across all industries with the highest proportions in property and business services (26%), education (16%), finance and insurance (12%), government administration and defence (10%) and manufacturing (10%). An analysis of occupational destinations by field of education showed similar patterns. Most education graduates went into teaching and academic professions, most health graduates became health professionals and health and welfare support workers, while graduates from other fields of education were spread across a much wider range of occupations.

Employment outcomes for graduates from disadvantaged backgrounds

This study confirms that graduate employment outcomes for people from disadvantaged backgrounds are relatively similar to outcomes achieved by the general university population. The 2008 GPS found that five years after graduating:

- Indigenous graduates were slightly more likely to be working. Nationally, 97 per cent of graduates who identified as Indigenous were in work compared with 91 per cent of those who did not so identify.
- There was little difference in employment rates when examined by origin of residential location. 91 per cent of graduates from metropolitan areas, 91 per cent of graduates from regional areas and 92 per cent of graduates from remote areas were in employment five years out. Graduates from remote areas were more likely to be working part time (23%) than were graduates from metropolitan graduates (16%) and graduates from regional areas (17%).
- Graduates from families whose parents had worked in 'non-professional' occupations were just as likely to be working as those whose parents had worked in professional occupations.
- Graduates who were the first in the family to attend university had comparable employment levels as those who were not first in family to attend university.

Graduate assessment of university experience

In general, graduate perceptions of the relevance and usefulness of their degree increased over time. Graduates were broadly satisfied with the quality of their degree and their general learning outcomes. They were slightly less satisfied with general development outcomes. In identifying the aspects of bachelor degree education that should be improved in order to enhance employability and

skills, graduates placed particular emphasis on enhancing the application and relevance of learning. Enhancing student support was also considered important. Graduates placed lowest emphasis on factors associated with the practicalities and convenience of study.

The value added

The GPS makes a significant contribution to currently available evidence on graduate outcomes in Australia. The 2008 results affirmed that bachelor graduates from Australian universities have sound employment participation rates, low unemployment, high work satisfaction, and salaries that increase substantially and are much higher than the national average.

The research helped identify that:

- considerable value would be derived from future implementation of the GPS, including with graduates who studied as international students
- considerable value would derive from work that helps institutions understand how to engage with their graduate community
- the 2008 GPS data should be further analysed to ensure that maximum policy value is extracted from the collection
- more in-depth work be undertaken to align GPS findings with those from international benchmark surveys
- analysis be undertaken to confirm new ways of measuring social inclusion, educational quality and graduate outcomes, and
- further analysis should also be conducted on the many experimental items included in the GPQ that have tested new ways of measuring social inclusion, educational quality and graduate outcomes.

A COMPENDIUM OF FINDINGS

Introduction

The 2008 Graduate Pathways Survey (GPS) investigated outcomes and transitions of graduates five years after completing a bachelor degree. The project was designed to provide information on employment outcomes for 'five-years out' bachelor degree graduates, how these outcomes change over time, the pathways students take to reach those employment outcomes and the factors that influence outcomes.

While the Graduate Destination Survey (GDS), conducted annually by institutions and Graduate Careers Australia (GCA) provides detailed information on employment outcomes for graduates four months after completing their university course, research suggests that it can take several years for graduates to settle into their chosen career path. The GPS provids new and national information on outcomes, pathways, and the supply of graduates to the labour market.

Project background

The Australian Council for Education Research (ACER) was commissioned to undertake this research. All Table A higher education providers (with one exception) as well as Bond University and the University of Notre Dame participated in the project with only one institution unable to return data. Letters and where possible emails with survey materials were sent to all domestic graduates who completed the requirements for a bachelor degree in 2002. Graduates had the choice of completing either a paper copy or an on-line version of the survey questionnaire. The survey was conducted from July to October 2008. A total of 9,238 graduates returned a usable response representing a response rate of around 12 per cent. To enhance the representativeness of results, survey data were weighted within each institution by gender and broad field of education.

Key characteristics of GPS respondents were compared with statistics from the Australian Bureau of Statistics (ABS) 2006 Australian Census and the Department of Education, Employment and Workplace Relations (DEEWR) Higher Education Student Collection. This analysis found the survey responses to be relatively representative on variables such as sex, residential location, field of education and labour force status. Some response bias in relation to educational qualifications and current engagement in study was identified with graduates with educational qualifications higher than a bachelor degree and with those currently enrolled in study or training being over-represented in the GPS data. The GPS and Australian Census have different populations so such differences may be expected, and overall the validity tests affirmed the representativeness of the secured responses. Given the response rate, however it must be emphasised that the results must be treated as indicative rather than definitive.

Main Findings

The Graduate Pathways Survey collected information on graduates' employment at one, three and five years after completion of their degree. In addition, it collected information on graduates' further participation in education and training as well as their perceptions of learning outcomes and the quality and relevance of their bachelor degree. This section presents a selection of the key findings.

Learning and development outcomes

Graduates were broadly satisfied with their general learning outcomes from their bachelor degree experience (average score of 61 out of 100). Outcomes such as improved competencies in writing, speaking, thinking, analysing, learning and working with others are included in this measure. More specifically:

- Indigenous graduates tended to be more positive about the contribution of their degree to their general learning with an average score of 67.
- Ratings generally became more positive as the graduate's average grade increased.
- Graduates who completed a degree in their preferred field of education reported more generic skill development than others (61 compared with 55).
- Slight differences in perceived learning outcomes occurred across fields of education with creative arts graduates recording the lowest scores (58) and engineers rating their degrees the highset (63).

Graduates reported lower levels of satisfaction with general development outcomes (average score of 45 out of 100). These development outcomes include the extent to which their degree helped them to contribute to the welfare of their community and to develop industry awareness and understanding of social contexts. More detailed findings are that:

- Group of Eight (Go8) graduates reported less development than those from IRU (Intensive Research Universities) institutions (43 compared with 47).
- Health graduates reported the highest levels of general development (52) compared with a much lower result for people who studied in the natural or physical sciences (36) or in information technology (37).
- Those who completed a degree in their preferred field of study saw themselves as having developed more through this degree than did others (45 compared with 39).

The average overall university grade reported by graduates was 75, and:

- The lowest grades were reported by Indigenous and Non English Speaking Background students.
- Average grades were comparable for graduates across different locations (based on current address and address at end of primary school), parental education and occupation.

Quality of degree

Graduates were broadly satisfied with the quality of their bachelor degree with an average satisfaction score of 64, but based on comparison of findings from the 2008 Australasian Survey of Student Engagement (AUSSE), this score appears to be lower than similar estimates for Canada and America. More specifically:

- For those Australian graduates who did not complete a degree in their preferred field, the average score was 52, compared with 65 among those who did study in their preferred field.
- Indigenous graduates had higher satisfaction scores (69) compared with others (64).
- Education graduates reported the highest satisfaction (68) and creative arts graduates the lowest (59).

Graduates' rating of careers advice at university was 39, sitting just above 'fair' on the four-point response scale.

Graduates were more likely to report that were they to start over again, they would attend the same institution again (73 on the 100-point scale) rather than enrol in the same degree (64 on the 100-point scale). For specific groups:

- Go8 graduates provided the highest ratings of satisfaction with their institution (77 on the 100-point scale).
- Those from metropolitan institutions had the lowest level of satisfaction at 68 on the 100-point scale (metropolitan universities in this report include Swinburne University of Technology, Edith Cowan University, University of Canberra, Bond University, University of Western Sydney, Australian Catholic University, Victoria University, Macquarie University, Deakin University, University of the Sunshine Coast, University of Notre Dame (Australia), and University of Tasmania).
- The average score for information technology graduates was 58 compared with 72 for architecture and building graduates, and the score for education graduates (71) was also relatively high.

Relevance of bachelor degree for work and study

As graduates' careers develop there is generally a rise in the perceived relevance and usefulness of their degree: bachelor degree study appears to be perceived as more relevant to work three to five years out than it is in the first year. This suggests that university training has a cumulative and sustained impact on a person's career in addition to an immediate impact on their initial entry into the job market. More specifically:

- The perceptions of Australian Technical Network (ATN) graduates show a different pattern – with these starting from a higher base and remaining consistently higher across the five-year period.
- Science, humanities and creative arts graduates' perceptions of relevance show persistent increases.
- Perceptions of relevance for professional qualifications in health, management and engineering remain relatively stable across the five-year period.
- There are slight declines in perceptions of the relevance of education and information technology degrees.

In identifying the aspects of bachelor degree education that should be improved in order to enhance employability and skills, graduates placed particular emphasis on enhancing the application and relevance of learning. Enhancing student support was also considered important. The lowest emphasis was placed on factors associated with the practicalities and convenience of study.

Participation in further study

Five years after completing their degree, a quarter (25 per cent) of all surveyed graduate respondents had completed a postgraduate coursework qualification and 6 per cent a postgraduate research qualification.

- The rate of research degree completion among Australian graduates was higher for those from the natural and physical sciences (23%), graduates with high overall grades (19%), and graduates from Go8 universities (10%), and graduates from the architecture and building, and education fields were least likely to have a postgraduate qualification five years after their bachelor degree.

Five years after completing their 2002 bachelor degree, over a third (38%) of graduates were participating in further learning. Nationally in 2008, 12 per cent reported involvement in short training courses, 5 per cent in vocational certificates or diplomas, 3 per cent in further undergraduate study, and 21 per cent in a postgraduate program. Overall, participation rates of bachelor degree in formal forms of vocational education and training are relatively low.

Go8 graduates were more likely to be involved in postgraduate study (25%) compared with vocational certificates (5%) or short courses (11%). Graduates from regional universities were less likely to be participating in postgraduate study than Go8 graduates (19% compared with 25%). On the other hand, graduates from regional universities were more likely to be involved in vocational education or short courses (21%) than Go8 graduates (16%).

The number of graduates involved in further learning – including both vocational and higher education – remained relatively stable across the five-year period following completion of their bachelor degree, declining from 41 per cent one year out to 38 per cent five years out. However, overall the rates of graduate participation in formal forms of vocational education and training are relatively low.

- Participation in further study was closely linked with field of education. While 60 per cent of science graduates were studying in the first year after completing their bachelor degree, this fell to 41 per cent five years out. Similar declines in participation in further study were observed among society and culture, management and commerce, information technology and creative arts graduates. By way of contrast, participation in further study increased over time following graduation among education, engineering, health, agriculture and architecture graduates. For instance, while 21 per cent of education graduates indicated they were participating in further learning in the first year after graduation, this figure rose to 28 per cent after five years.
- Different patterns of study participation occur for students with different average grades. Those with grades between 90 and 100, for instance, had high levels of participation one year after graduating (46 per cent) which five years later had decreased to 34 per cent whereas participation of graduates with grades of between 50 and 59 moved from 35 per cent after one year to 38 per cent after 5 years.
- Graduates with lower socio-economic backgrounds were slightly less likely to participate in further learning in the year after graduation, although they were equally likely to participation in further learning five years down the track.
- Males are slightly more likely than females to be involved in further study in the first and third years after graduation (42% compared with 40%, and 43% compared with 40%), but slightly less so after five years (37% compared with 39%). There is little difference in gender patterns of participation in postgraduate study: 23 per cent of male graduates were participating in postgraduate study in the first year in comparison with 20 per cent of female graduates while 27 per cent of males and 24 per cent of females engaged in postgraduate study in the third year. After five years, females were more likely to have a postgraduate coursework degree as their highest qualification (26% compared with 23%), while males were more likely to hold a postgraduate research qualification (8% compared with 5%).

Participation in employment

In 2008, five years after completing their bachelor degree, 75 per cent of graduates were involved in full-time work, 16 per cent in part-time work, and 9 per cent were not working. After filtering out graduates involved in formal vocational, undergraduate and postgraduate education, these

percentages adjusted to 80 per cent in full-time work, 13 per cent in part-time work and 8 per cent not working,.

The rate of participation in paid work rose from 84 per cent to 91 per cent between the first and fifth year following graduation.

- Rates of full-time work increased (60% to 75%) whereas those of part-time work decreased (24% to 16%).
- Science graduates had lower levels of workforce participation in paid work across the period under study in comparison with engineering and education graduates who had consistently high levels of workforce participation.
- In the fifth year after graduation, engineering, information technology, management and commerce, and architecture and building graduates had the highest rates of full-time employment. By contrast, graduates from the creative arts, society and culture, and health fields reported the lowest rates of full-time employment.
- Males were more likely than females to be participating in the workforce after five years, particularly in full-time work. After five years, 84 per cent of males were in full-time work in comparison with 69 per cent of females. Five years after graduation, about seven per cent of female graduates in this survey nominated their main activity as child rearing or a related domestic role.
- Higher levels of academic performance were associated with lower levels of (full-time but not part-time) workforce participation.
- People with non-English speaking backgrounds were less likely to be participating in paid work in the first year after graduation, but by the fifth year, there was no difference between these and other graduates.

Paid work during undergraduate study appears to have a reasonably positive influence on graduates' vocational outcomes.

Industries and occupations of graduates

Architecture, health and education graduates are more likely to be working in a narrow range of industries whereas science, IT, engineering, agriculture, management, humanities and creative arts graduates are more likely to be working across a diverse range of industries. The highest levels of matching between industry and field of education occur in the more vocational fields of education. Five years after completion:

- 85 per cent of education graduates worked in the education industry
- 80 per cent of health graduates worked in the health and community services industry
- among architecture graduates, 54 per cent were employed in construction and 16 per cent in the property and business services industries
- one third (34%) of science graduates worked in the education industry with 24 per cent working in health and community services, and 11 per cent working in government administration and defence
- 28 per cent of humanities (society and culture) graduates worked in the health and community services industry, 22 per cent in education and 19 per cent in government administration and defence
- agriculture graduates employed five years after graduation were mainly working in government administration and defence, agriculture, forestry and fishing, and education with slightly fewer employed in health and community services and property and business services

- information technology graduates were spread over a number of industries, with property and business services employing more than one quarter (25%), and
- creative arts graduates most commonly worked in education (25%), while 16 per cent worked in cultural and recreational services and 13 per cent in the manufacturing industry.

Graduates from some fields of education experience more movement across industries than others in the first five years after graduation:

- Around 13 per cent of science graduates are employed in the retail trade industry in their first year out but this proportion decreases by their third and fifth years. The employment of science graduates in education increases between the first and third years, but then decreases by year five. By contrast, there is a steady increase in the proportion of graduates employed in government and in the health and communities services industry.
- Health graduates are most likely to be employed in the health industry, though this falls from 82 per cent to 80 per cent in the first five years after graduation. Employment of health graduates in the education industry increased from 6 per cent to 9 per cent over the five year period.

The occupational destinations of graduates also changes over time with half (51 per cent) of the graduates working in occupations classed as 'professional' or 'managerial' in the first year, rising to 63 per cent after five years.

The proportion of graduates employed in professional or managerial occupations in the fifth year varies from 46 per cent of management and commerce graduates to 91 per cent of education graduates.

Five years after completing their bachelor degree, the most common occupations in which graduates were working were: Education Professionals; Design, Engineering, Science and Transport Professionals; Health Professionals; Health and Welfare Support Workers; Specialist Managers; Numerical Clerks; and Legal, Social and Welfare Professionals.

Graduate salaries

At the national level, the median graduate salary rose from $38,000 to $60,000 in the first five years post-graduation – a 58 per cent increase. At the five-year mark the salary for the middle fifty per cent of graduates ranged from $47,726 to $78,000, which compares favourably with the average weekly earnings of $46,332 for all workers in Australia.

- Go8 graduates tended to achieve the largest increase in salary over five years from $35,000 to $63,000 – an 80 per cent increase. ATN graduates salaries increased from $44,000 to $64,000 (60%). IRU, regional and metropolitan university graduates' salaries increased at slightly lower rates to reach $56,000 (up 56%), $61,000 (up 51%) and $60,000 (up 54%) respectively.
- Graduates from some fields of education experienced faster increases in salaries. Engineering graduates experienced a median salary increase from $42,000 in their first year out of university to $78,000 by their fifth year. Over the same period, education graduates' salaries increased from $42,000 to $56,000 (moving from being the equal highest paid in their first year after university, to second lowest (of 10 fields analysed) by the fifth year after graduation).

Males reported consistently higher salaries than females, a difference that grew across the five-year period under study: the median salary for males five years after completion of a Bachelor degree is $70,000 compared with $57,000 for females. Males and females working part time had the same median salary. The difference lay in terms of median salary for those in full-time work – $70,700 for males and $60,000 for females.

Even after taking into account other factors that may account for salary differences, males are estimated to earn around $7,800 more per year than females in the fifth year after graduation. In the first year out of university, the gap is just over $2,000 in favour of males, growing to $3,300 by the third year out of university and then jumping substantially to $7,800 by the fifth year. The regression model that included age, work status (part time, full time), occupation type (professional/managerial, other), enrolment in current study, field of education and industry of occupation explained 34 per cent of the variation in graduates' salary five years after Bachelor degree completion.

Work satisfaction

Graduates were broadly satisfied with their work, with mean scale scores increasing from 58 to 69 (out of 100) across the first five years after graduation.

- There was a positive relationship between average grade during university studies and satisfaction with work five years after graduation.
- Graduates who had completed their degree in their preferred field of education were more satisfied than those who had undertaken a non-preferred degree (70 compared with 60).

Job search and time in current job

Five-years out, regardless of their current work situation, around 15 per cent of graduates were seeking full-time work and around half that number, 7 per cent, were seeking part-time work.

- Those not working, by the end of the fifth year 13 per cent were seeking full-time work and a further 13 per cent were seeking part-time work.
- Indigenous graduates appear increasingly more likely to seek part-time work over time – the rate increasing from 2 per cent to 5 per cent to 13 per cent , one, three and five years after graduation. There are similar trends for graduates who report having a disability.
- Those graduates who achieved lower marks in their degree were also more likely to be looking for full-time work (23%) after five years.

Among the graduates who were working five years after completion of their bachelor degree, the median length of time spent in their current job was 22 months. This varied among fields of education: from an average of 17 months for creative arts graduates to 46 months for those who completed an education qualification.

Employment arrangements

Of those graduates who were in employment five years following completion of their bachelor degree, nationally, just under a tenth (9 per cent) reported being in temporary or casual employment, just over three-quarters (76 per cent) reported having a permanent or open-ended contract, and 16 per cent reported having a fixed-term contract.

Five years after graduation, the proportion of graduates in permanent employment or open-ended contracts increases while the proportion in temporary or casual employment falls.

Returning to work in Australia

Nearly all graduates (93 per cent) reported Australia as their country of work. However as those not living in Australia are likely to have lower response rates, this estimate should be regarded with caution.

In some fields of education there appeared to be a trend to work overseas for a period and then to return to work in Australia. More architecture, creative arts, society and culture, education, agriculture and environmental studies graduates who responded to the survey were working in Australia five years after graduation than at the first or third year after graduation.

Employment outcomes for graduates from disadvantaged backgrounds

This study found that for those disadvantaged students who do gain entry to and complete university, outcomes in terms of employment are relatively similar to the general university population. This survey found that five years after graduating:

- Indigenous graduates were slightly more likely to be working: 97 per cent of graduates who identified as Indigenous were in work compared with 91 per cent of those who did not so identify.
- There was little difference in employment rates when examined by origin of residential location. 91 per cent of graduates from metropolitan areas, 91 per cent of graduates from regional areas and 92 per cent of graduates from remote areas were in employment five years out. Graduates from remote areas were more likely to be working part time (23%) than were graduates from metropolitan graduates (16%) and graduates from regional areas (17%).
- Graduates from families whose parents had worked in 'non-professional' occupations were just as likely to be working as those whose parents had worked in professional occupations.
- Graduates who were the first in the family to attend university had comparable employment levels as those who were not first in family to attend university.

Graduates from low socio-economic backgrounds

A separate analysis was conducted of students from low socio-economic backgrounds who reported that neither their mother nor father were employed in professional occupation, that neither their mother nor father attended university, and whose postcode at the end of primary school was in the lowest socioeconomic status quartile. This group represented 12 per cent of the survey respondents.

- They reported learning and development outcomes and average grades on a par with those of other students.
- Their bachelor degrees were seen to be of equal relevance to further study and work in the first, third and fifth years after graduation.
- They were just as likely to be involved in education or training in the first, third or fifth years after graduation. After five years, they were very slightly less likely to have obtained postgraduate coursework qualifications (22% compared with 25%) and to have an undergraduate degree as their highest level of attainment (72% compared with 68%).
- They were slightly less likely than other graduates to be in full-time work in the third and fifth years (66% and 70% respectively compared with 70% and 75%) and slightly more likely to be in part-time work (23% and 19% respectively compared with 18% and 16%).
- Their median salary across the five years was comparable with the average reported salary for all graduates.

Graduates from provincial and remote locations

A comparative analysis of students who at the end of primary school resided in metropolitan, provincial (regional and cities with fewer than 100,000 residents) and remote locations found:

- Graduates from provincial and remote areas were much more likely to have attended a regional university than those who grew up in a metropolitan area.
- By year five, there was little difference in the proportion of graduates employed who came from metropolitan, regional or remote areas (91%, 91% and 92%). A higher proportion of graduates from remote areas were working part-time (23% compared with 16% for metropolitan and 17% of regional graduates)
- By the fifth year following graduation, the majority of those who grew up in a remote area of the country are living in one of Australia's state or territory capital cities. Most of those who were from metropolitan areas were also living in capital cities. However, among those who grew up in regional towns, less than half were living in a capital city by the fifth year after graduation.
- In the first year after university, graduates who came from remote areas had a lower rate of participation in the labour force than those from metropolitan and provincial areas. By the fifth year out of university, participation of graduates who came from remote areas had improved to be comparable to graduates who came from metropolitan and regional areas.
- Graduates from remote areas had higher unemployment in the first year out of university while graduates from metropolitan areas had lower unemployment. However, by the third and fifth year out of university, unemployment rates were comparable across graduates from different locations.
- In the first and third year after graduation there was no difference in the average full-time salaries of graduates from different locations. However, by the fifth year, those raised in a metropolitan ($64,500) area had a slight advantage over those who grew up in regional Australia ($61,000) and those from remote areas ($60,000).

Indigenous graduates

Five years after graduating Indigenous graduates were slightly more likely to be working: 97 per cent of graduates who identified as Indigenous were in work compared with 91 per cent of those who did not so identify.

Indigenous graduates tended to be more positive than other graduates about the contribution of their degreee to their general learning outcomes with an average score of 67 (compared with 61 for all graduates).

Indigenous graduates had higher levels of overall satisfaction with the quality of their degree (69) compared with others (64).

Indigenous graduates reported lower average overall university grades.

Indigenous graduates who are looking for work appear increasingly more likely to seek part-time work – the rate rising from 2 per cent to 5 per cent to 13 per cent at one, three and five year intervals after graduation.

Science and engineering career paths

There are substantial differences in the study and workforce participation patterns of science and engineering graduates.

Participation in further study differs among science and engineering graduates.

- Sixty per cent of science graduates were enrolled in some form of further study in the year after completing their bachelor degree. This is a much higher proportion than the overall average of 41 per cent. Engineering graduates, on the other hand, had lower participation in further study (34 per cent) in the first year after graduation.
- By the fifth year after graduation, the rate of engagement in study among science and engineering graduates is almost identical with enrolment in study among engineering graduates rising over the five year period, while declining for science graduates.
- At the one, three and five year time periods, science graduates who are in study are much more likely to be enrolled in a postgraduate course (postgraduate degrees, certificates or diplomas) than those from engineering fields. Engineering graduates have a lower take-up rate of postgraduate study than the average across all fields.

There are also noticeable differences in the labour force participation rates of science and engineering graduates.

- Among engineering graduates, labour force participation is high (83%) in the year following graduation, and rises to a high of 96 per cent by the fifth year after graduation.
- Among science graduates, the initial participation rate is comparatively low (67%). This rate rises steadily over the subsequent years to 85 per cent – close to the average rate, although still behind the rate among engineering graduates.

By the fifth year after graduation, there are clear differences between the graduate destinations of science and engineering graduates. Among science graduates, 70 per cent were employed in either education, health or government. By contrast, engineering graduates were more likely to be employed in the property and business services, manufacturing, and mining industries.

Science graduates appear to take longer in obtaining work relevant to their degrees compared with engineering graduates. The proportion of science graduates employed in the retail industry fell from 13 per cent in the first year to 2 per cent in the fifth year. In addition the proportion of science graduates employed in accommodation, cafes and restaurants fell from 5 per cent to less than 1 per cent between the first and fifth years after graduation. The proportion of engineering graduates employed in these industries also declined over time, but from a much lower base.

Education and nursing graduates

In this analysis of education graduates, only those who completed a Teacher Education (ASCED narrow field of education code 0701) bachelor degree were included. The focus for this report was the outcomes and pathways of bachelor degree graduates and for this reason, the analysis does not investigate the outcomes relating to the alternative pathway to a teaching qualification - a graduate diploma of education. Those included in the nursing analysis completed a Nursing (ASCED narrow field of education code 0603) degree.

Nursing and education graduates are predominantly female. Among GPS respondents, 89 per cent of nursing graduates, and 80 per cent of education graduates were women. This factor may be an influence on the labour force participation patterns of these two groups.

Labour force participation among nursing and teacher education graduates is particularly high in the first year after university, but declines thereafter.

- Among education graduates, the rate of workforce participation goes from well above average participation in the first year out of university to below average participation by the fifth year.
- While labour force participation among nursing graduates declines over time, neverthess by the end of five years it is higher than average.

Nursing and teacher education graduates are more likely to work in those industries for which they are trained. .

- 98 per cent of nursing graduates were working in the health industry and 87 per cent of teacher education graduates were working in the education industry one year out.
- By year five, 96 percent of nursing graduates were working in the health industry while 85 per cent of education graduates were employed in the education industry.

The proportion of nursing graduates in full-time work declines over time while the proportion of teacher education graduates in full-time work increases between year one to year three, before falling back slightly in year five.

Nursing and teacher education graduates in full-time employment have higher salaries than all graduates on average in year one. By year three, their salaries are comparable with salaries of all graduates. By the fifth year after graduation, nursing and teacher education graduates' salaries have fallen below average graduate salaries.

ACKNOWLEDGEMENTS

The Australian Council for Educational Research (ACER) would like to thank the Australian Government Department of Education, Employment and Workplace Relations (DEEWR) for funding this project.

The authors express particular thanks to Ms Anne McConnell for her expert and formative input throughout the project. Our thanks also to Mr Jason Coutts, Mr Phil Aungles, Mr Michael Teece Mr Adrian Pawsey, Dr Poonam Bhatia and Dr Nichola McCann.

Colleagues at ACER who assisted with the research include Mr Carole Buckley, Mr Jim Carrigan, Mr Robert Jinks, Mr Stephan Nesteroff , Mr David Rainsford, Mr David Tran and Ms Jenny Trevitt.

All Australian universities participated in this project, and ACER owes them and their staff a very warm thanks. Particular thanks go to the following people and their colleagues who together helped endorse, shape and coordinate the development:

- Mrs Pheng Schooling and Professor Gabrielle McMullen (Australian Catholic University)
- Ms Leone Nurbasari and Professor Lawrence Cram (Australian National University)
- Mr Peter Garrigan (Batchelor Institute)
- Mr Christina Hogan and Professor Garry Marchant (Bond University)
- Ms Suzi Blair and Mr Chris Lynch (Central Queensland University)
- Ms Eike Pakeha and Professor Charles Webb (Charles Darwin University)
- Ms Michelle Fawkes and Mr Col Sharp (Charles Sturt University)
- Ms Alice Tsang and Mr Marco Schultheis (Curtin University of Technology)
- Mr Scott Nichols and Ms Lin Martin (Deakin University)
- Mr Tony Lazzara and Professor Ron Oliver (Edith Cowan University)
- Miss Talitha Bennett and Mr David de Bellis (Flinders University)
- Ms Wendy Marchment and Dr Richard Armour (Griffith University)
- Mr Geoff Bell and Prof Andrew Vann (James Cook University)
- Ms Sally Went and Professor Belinda Probert (La Trobe University)
- Mr Lukas Frey and Mr Peter Leunig (Macquarie University)
- Associate Professor Sid Nair and Ms Louise McCarthy (Monash University)
- Ms Christina Ballantyne and Professor Jan Thomas (Murdoch University)
- Dr Sam Nielsen and Professor Vi McLean (Queensland University of Technology)
- Mr Angel Calderon and Professor Joyce Kirk (RMIT University)
- Ms Liz Terracini and Ms Karen van Sacker (Southern Cross University)
- Ms Straty Savvas and Mr Tom Auman (Swinburne University of Technology)
- Mr David Hirst and Mr Dan McHolm (University of Adelaide)
- Ms Pat Mann and Mr Greg Jakob (University of Ballarat)
- Ms Pauline Ding and Professor Carole Kayrooz (University of Canberra)
- Ms Suzanne Daroesman and Mr Michael Beaton-Wells (University of Melbourne)
- Mr John Kleeman and Ms Maree Lake (University of New England)
- Mr David MacPherson and Professor Joan Copper (University of New South Wales)
- Ms Margaret Stevenson and Professor Kevin McConkey (University of Newcastle)
- Ms Sarah Linton and Ms Sofia Elliott (University of Notre Dame)
- Ms Deanne Gannaway and Dr Anne Gilmore (University of Queensland)

- Ms Sue Mikilewicz and Professor Peter Lee (University of South Australia)
- Ms Justine Martens and Dr Neil Peach (University of Southern Queensland)
- Ms Jennifer Ungaro and Professor Derrick Armstrong (University of Sydney)
- Ms Gheeta Krishnan and Professor Gail Hart (University of Tasmania)
- Ms Keri Neveldsen and Professor Shirley Alexander (University of Technology Sydney)
- Ms Tanya Tietze and Ms Kerry Martin (University of the Sunshine Coast)
- Dr Greg Marie and Mr Robert McCormack (University of Western Australia)
- Mr Mahsood Shah and Professor Geoff Scott (University of Western Sydney)
- Ms Milena Snoek and Mr Aden Steinke (University of Wollongong), and
- Ms Judith-Ann Robertson and Ms Robyn Harris (Victoria University).

The following people and organisations assisted with consultations:

- Mr Peter Torjul (National Association of Graduate Careers Advisory Services (NAGCAS))
- Dr Peter Carey (Career Development Association of Australia (CDAA))
- Ms Michele Dunn (Association of Development and Alumni Professionals in Education (ADAPE))
- Ms Cindy Tilbrook and Mr Anton Griffith (Graduate Careers Australia (GCA))
- Mr Paul Russell and Mr Ben Reeves (Australian Association of Graduate Employers (AAGE))
- Mr Patrick Coleman (Business Council of Australia (BCA))
- Ms Mary Hicks (Australian Chamber of Commerce and Industry (ACCI))
- Mr Peter Carnavan (Australian Industry Group (AIG)), and
- Mr Alex Maroya (Universities Australia).

Most importantly, ACER would like to thank those graduates who took the time to reflect on their career and education pathways over the last five years, and to return a response.

ACRONYMS AND ABBREVIATIONS

ABS	Australian Bureau of Statistics
ACER	Australian Council for Educational Research
ANZSCO	Australian and New Zealand Standard Classification of Occupations
ANZSIC	Australian and New Zealand Standard Industry Classification
AQTF	Australian Quality Training Framework
ASCED	Australian Standard Classification of Education
ATN	Australian Technology Network of Universities
ATSI	Aboriginal and Torres Strait Islander
AUSSE	Australasian Survey of Student Engagement
CEQ	Course Experience Questionnaire
COAG	Council of Australian Governments
DEEWR	Department of Education, Employment and Workplace Relations
FYEQ	First Year Experience Questionnaire
GCA	Graduate Careers Australia
GDS	Graduate Destination Survey
Go8	Group of Eight Universities
GPQ	Graduate Pathways Questionnaire
GPS	Graduate Pathways Survey
IRU	Innovative Research Universities Australia
IT	Information Technology
LSAY	Longitudinal Surveys of Australian Youth
MCEETYA	Ministerial Council on Education, Employment, Training and Youth Affairs
NCVER	National Centre for Vocational Education Research
NESB	Non-English Speaking Background
OECD	Organisation for Economic Cooperation and Development
REFLEX	Flexible Professional in the Knowledge Society
SACC	Standard Australian Classification of Countries
SEIFA	Socioeconomic Index for Areas
UK	United Kingdom
USA	United States of America
VET	Vocational Education and Training

1 INTRODUCTION

> I have not practised as a lawyer for over two years, however, the range of skills I have acquired in such a discipline will be a great springboard to a range of new careers… (29 year old female law graduate)

> The critical thinking and communication skills I developed during five years of rigorous study have proven the most relevant to my working life… (29 year old male law graduate)

Background and context

This report presents findings from the first national study in Australia of bachelor degree graduates five years after degree completion. It details the design, development, implementation and outcomes of the Graduate Pathways Survey (GPS). Findings from the 2008 GPS are wide ranging. They must be read within the context of the project's methodology which is detailed in Appendix B, but it is clear that the findings have the capacity to shape university education and the development of Australia's economy and professional workforce.

These initial insights contribute to a complex web of rapidly evolving policy and educational contexts. The Australian Labor Party was elected to federal government in late 2007 with one of its core policy themes being the development of skills and national productivity. The Bradley Review of Australian Higher Education (Bradley, Noonan, Nugent & Scales, 2008) has been undertaken in 2008, and has made a number of significant recommendations about the nature and financing of university education, participation rates, graduate outcomes, social inclusion and Australia's higher-order skill needs. Following two decades of rapid expansion, an increasing number of institutions are undertaking institution-wide curriculum redesign to enhance graduate outcomes and the productivity of their provision. The system continues to internationalise, underpinning Australia's largest service export and its third largest export industry overall.

Contexts such as these underpin the need for greater insight into the nature and outcomes of higher education in Australia and, indeed, the need for processes which can provide such insight in robust and timely ways. While the economic climate at the end of 2008 may foreshadow possible decline in demand for graduate labour, in fact demand is forecast to grow strongly over the next ten years (Bradley et al., 2008; Birrell, Healy, Edwards & Dobson, 2008). Hence it remains vital to ensure that individuals, institutions and the system overall respond to opportunities and needs in the most effective ways. The development of a strong and vibrant knowledge economy is linked in direct ways with successful outcomes from university education.

Findings from the 2008 Graduate Pathways Survey are of interest to a wide range of audiences. Potential university learners need timely and relevant information they can use to inform study and hence career choices. Ensuring that recent graduates are aware of work options and career pathways is important for them as individuals and for the Australian economy more generally. Graduate employers can make more informed recruitment and professional learning decisions given further information on medium-term graduate experiences. It is important, in turn, that careers and other advisors at institutions are well informed about the contexts and opportunities that shape graduates' employment trajectories. With greater insight into learners backgrounds, experiences and outcomes, university teachers, managers and leaders can redesign and enhance programs and student supports. The findings provide government with information on the economic and social contributions made by institutions and graduates.

In summary, to provide university education at a level and quality and in fields that ensure graduates have successful labour market outcomes, and which facilitate growth in the economy, it is important that there is an overall understanding of the pathways that university graduates take following the completion of their degrees. Initial entry into the labour market is important, but the nature of contemporary knowledge work means that the foundations of many careers take at least three to five years to develop. Studying bachelor degree graduates 'five years on' helps identify trends in graduate perceptions of their courses and the relevance of such courses to their future employment pathways.

Focus and scope of the development

In May 2008 the Australian Council for Educational Research (ACER) was engaged by the Department of Education, Employment and Workplace Relations (DEEWR) to investigate graduates' employment outcomes five years after completion of a bachelor degree. The 2008 Graduate Pathways Survey (GPS) is a new cross-institutional study of the destinations and transitions of Australian university graduates.

The Graduate Pathways Survey reflects the first time that national data has been collected from Australian higher education graduates, in this case domestic bachelor degree graduates, five years after completion of their degree. Summary information is collected in the Australian Census (ABS, 2007) and other occasional surveys, but the GPS offers considerably more detailed information that is of particular relevance to the higher education.

The implementation of a national survey of graduates 'five years out' provides new information into the function, productivity and quality of university education in Australia. The collection is designed to provide baseline insights on graduate supply that can shape policy and inform practice.

In particular, the development sought to provide insight on the following areas:

- patterns within graduate career pathways, particularly relations between field of education and industry
- capabilities of university graduates within the Australian labour market
- labour market expectations of university graduates
- graduate perceptions of careers advice received at university
- perceptions of the benefit of a university education among graduates
- satisfaction with university education and development of capabilities for work, and
- the range of pathways taken by university graduates from different fields of education, socioeconomic backgrounds, geographical locations, and higher education institutions.

The specific objectives of the project were to:

- improve knowledge and understanding of employment outcomes for 'five years out' bachelor degree graduates, how these change over time, the pathways students take to reach those employment outcomes and the factors that influence outcomes
- establish what proportion of 'five years out' bachelor degree graduates are working in an occupation directly related to the field of education they studied in their undergraduate degree, what proportion are working in a field not related to their study, and how this varies for different fields of education
- determine how 'five years out' outcomes differ from 'four months out' outcomes, which graduates experience the most change in outcomes, and how earnings increase in the first five years of employment and how this varies by occupation

- identify the important factors influencing employment outcomes and the relative importance of each, and
- map the typical pathways bachelor degree graduates take to reach their employment goals and how these vary by course, student and institution characteristics, and examine whether outcomes vary by employment experiences prior to completing their bachelor degree and what proportion undertake further study, including vocational education and training (VET).

Considerable value would be derived from future implementation of this data collection. As this report suggests, the results have the potential to add enormous value to system- and institution-level monitoring and planning. To enhance national and institutional systems and process, and to help further establish the veracity of the data, ACER suggests that the collection be administered on an annual basis for at least another two years. Consideration could then be given to conducting a bi-annual administration.

Key finding 1: The Graduate Pathways Survey provides new and valuable information into the function, productivity and quality of university education in Australia. The collection provides insights on graduate supply that has the potential to assist system- and institution-level monitoring and planning. To consolidate the GPS, it is suggested that the collection be replicated on an annual basis until 2010, with consideration then given to administering the collection on a bi-annual basis thereafter.

Overview of the project approach

The project required comprehensive development of a robust and efficient national data collection in a very short period of time. New instruments and support resources were developed and validated, as were tailored data collection and analytical approaches. In many instances, implementing the GPS involved supporting institutions undertake new forms of engagement with their graduate community.

Figure 1 summarises the project's phased approach. A detailed overview of the project's methodology is included in Appendix B. Key analytical contexts are summarised in chapter three. The project commenced in late May 2008. ACER produced all main deliverables by Wednesday 24 December, and scheduled for institution reports to be produced in early 2009.

Phase/Activity	2008								2009		
	M	J	J	A	S	O	N	D	J	F	M
Preparation											
Planning and design											
Instrument and system development											
Population operationalisation and verification											
Coordinate fieldwork preparation											
Fieldwork											
Institution sends first email to all graduates											
Institution sends mail to graduates											
Institution sends second email to graduates											
Institution sends third email to graduates											
Graduates reply directly to ACER											
Reporting											
Data preparation and analysis											
Production of project report											
Production of institutional reports											

Figure 1 The project's schedule

Overview of this report

This report contains five further chapters and a series of technical appendices and attachments. The document can be read as a whole, or as a series of relatively independent contributions. The report is essentially descriptive in nature, it's main purpose being to offer baseline data on graduate outcomes five years after degree completion. While an attempt has been made to report results in policy-relevant ways, and to minimise discussion of technical matters, the report does not offer prescriptive policy advice. Accordingly, while a series of 'key findings' are made throughout the report, the report does not contain recommendations for policy or practice.

Given the perspective offered by the GPS and the scope of the instrument and data, this report is necessarily preliminary in nature. Extraction of all available information from the 2008 GPS would require many more months than have been available for the current analysis. Further studies of the reliability and validity of the data and research materials should also be undertaken. A full appreciation of the data will unfold following more detailed and sophisticated analyses.

The next chapter provides a research-based background on graduates' careers and relevant policy contexts. The main intent of the project is to provide descriptive information about graduates' early careers. It helps to locate this contribution in terms of current policy considerations pertaining to social inclusion, productivity and workforce needs.

Chapter three sketches key analytical contexts which underpin the chapters that follow. It gives an overview of the target population and scope of the sampling, and of the main variables analysed.

The GPS offers a new perspective on university education in Australia and the instrument – the Graduate Pathways Questionnaire – yielded a significant amount of data. The final three chapters present a broad overview of the results and in doing so attempt to bring out early key findings.

Chapter four focuses on graduates' education outcomes. It considers reports of learning and development outcomes, satisfaction with study, perceptions of the relevance of study, and identifies areas for improving education. Statistics are provided on patterns of participation in further study at the five-year mark. Trends across the first five years beyond graduation are also considered.

Chapter five concentrates on graduates' employment destinations and pathways. It presents a national picture on participation in further learning and in work. It looks at job seeking activity, and then reviews characteristics of the nature of graduates' work. The Graduate Pathways Questionnaire was designed to capture information on graduates' activities at the first and third as well as fifth

year after graduation. Hence this chapter explores both outcomes after five years as well as the pathways taken by graduates towards these destinations.

The sixth and final chapter presents specific analyses focused on areas of particular interest. Key demographic areas of interest, such as gender differences, graduates from disadvantaged backgrounds, regional graduates and those working during study are explored in this chapter. In addition, the outcomes of engineering, science, education and nursing graduates are given particular attention here.

A concluding chapter summarises key policy themes and considers implications for future research.

Each chapter in this report ends with a selection of individual graduate stories. Derived from review of individual survey responses, these mini case studies have been prepared to give texture to the otherwise largely descriptive quantitative analysis. They are designed to help illustrate the diversity of pathways taken by graduates and the range of data that has been collected in the survey.

The appendices and attachments provide useful supplementary material to the main report. Appendix A provides an overview of the Australian Council for Educational Research (ACER). Appendix B provides a technical report of the project's development and approach. This includes information about population and sample specifications, and verification of the inferential properties of the secured data. The attachments include more detailed supplementary materials, including the research instrument, codebook, administration manual and supplementary results.

Jack, a mature aged student in his fifties completed a double degree in commerce and computing in 2002 and has since completed a PhD and now works as an academic at the university in which he completed his bachelor degree. The first in his family to attend university, his father was a fitter and turner and his mother a housewife. He chose to attend university in order to further develop his work skills and improve his career prospects by studying accounting and computer programming. Now employed full-time as an academic teaching accounting and conducting research, Jack is very satisfied with the work and certainly sees himself continuing with this kind of work in the future.

James' father was a sales representative who sold hardware supplies and his mother took care of the home. Both parents were university educated. James attended primary school in the USA, but was now a permanent resident of Australia, living in a capital city.

James was 48 when he started a bachelor degree majoring in psychology at 'Perth University', which he undertook mainly for interest but also to help with a career change. He studied part time and worked around 30 hours a week during his study. He gained good skills in certain areas, mainly associated with thinking, analysing and solving problems. In other more vocationally specific areas he felt less confident in the skills he developed while studying. His average mark was around 75. Overall, James was very satisfied with his university study, particularly in terms of its capacity to set foundations for subsequent higher education study. He was less satisfied with careers advice, however, and it was in those areas of individual support that he felt university services could be improved.

James had been working for an industry training council as a research officer since May 1996 for around 30 hours per week on an annual salary of $40,000 – the job he held during his bachelor studies. In 2004, two years after completing his bachelor of science degree, James secured a post as a director undertaking qualitative research at a research consulting firm. His work hours went up to 45 hours, but so did his salary to $45,000. Perhaps more importantly, he saw himself doing this work less out of economic necessity and more due to interest in the field. He saw himself staying in this field for the medium term, and in 2008 he secured a related role as a development consultant managing offenders for a correctional services agency. His work hours reduced to 38 and his salary rose to $60,000. More importantly he saw a better fit between his bachelor degree, and a consequent increase in his employability and job satisfaction.

2 RESEARCH CONTEXTS

> Being exposed to great lecturers one of whom has mentored me and helped my career to take off [was the most relevant aspect of the degree]. (50 year old female behavioural science graduate)

> [The degree] gave me a theoretical background, taught critical thinking and research methodology. (41 year old male science graduate)

> [The degree] provided a good foundation for a general knowledge of the industry I'm in and the sorts of work, but I strongly believe the best education is the one you get 'on the job'. I think I learnt more about my career in my first year working than I did in my three years at uni… (26 year old female sales and marketing graduate)

Introduction

This chapter provides a policy-level overview of key contexts underpinning the 2008 Graduate Pathways Survey. It offers a survey of what existing Australian and international research has to offer in this area. It closes by emphasising the importance of the 'five year' perspective, and by sketching a few areas of particular contemporary relevance.

As the introductory notes suggested, evidence-based insights into graduate destinations can play an important role in shaping policy and practice in Australia. The current study provides a means of identifying trends in graduates' perceptions of their courses and the relevance of such courses to subsequent employment and learning pathways. As the following review suggests, this new perspective adds substantially to existing knowledge about the career trajectories of graduates in Australia, and provides a key point of reference for international comparisons. Ensuring that the pathways of graduates are well understood by universities, employers, government and potential students is crucial to managing the supply of and demand for university qualifications now and in the future.

Insights from existing research

Australian research

In Australia, the perceptions and immediate graduation pathways of university students are monitored yearly through the DEEWR-funded Graduate Destinations Survey (GDS), administered by higher education providers to graduates four to six months after the completion of qualifications. In general the GDS data tend to show that in the early period following completion of university, graduates in Australia are successful in finding employment. Figures for 2007 show that 84.5 per cent of bachelor graduates who were available for full-time employment were employed on a full-time basis in the four months following completion of their course (Graduate Careers Australia, 2007: 2). The GDS also reveals that the salaries of graduates upon entering the labour market are relatively robust when compared to the average weekly earnings across all those employed in Australia. Over the past decade, graduate salaries have been approximately 80 per cent of the male average weekly earnings (Graduate Careers Australia, 2007: 6).

The GDS figures suggest that bachelor graduates from Australian universities fare well in the early stages of their entry into the labour market. These outcomes are also supported by other Australian research into graduates and their experiences in the workforce following graduation. In particular, work stemming from the Longitudinal Surveys of Australian Youth has shown that a relatively

small proportion of graduates have a problematic transition from study to work (Lamb, 2001; Marks, forthcoming).

The relative success of university graduates in the labour market is confirmed by figures from various statistical collections held by the Australian Bureau of Statistics (ABS) and reported by a range of government agencies, including DEEWR (2008). In the ABS *Australian Social Trends* publication in 2004, a specific chapter was devoted to identifying the labour market success of graduates. This ABS publication compiled figures from the Australian Census, the Labour Force Survey and the Education and Work survey comparing university qualified persons with others in the population on a range of labour market outcomes. It found that "higher education graduates are less likely to be unemployed and tend to have higher incomes" (ABS, 2004: 95).

Apart from these large-scale data collections, other Australian research into the labour market outcomes and pathways of university graduates tends to be more subject and institution specific. A number of studies relating to graduate destinations and perceptions of specific groups of students have been carried out in Australia over the past decade. Examples of this research include: a study of library and information management graduates at Charles Sturt University (Heazlewood, Pymm, & Sanders, 2006); analyses of Business and Commerce, and Tourism students at Monash University (Goyal & Weiler, 2006); exploration of outcomes for library and records management courses at Curtin University (Genoni, Exon, & Farrelly, 2000; Genoni & Smith, 2005); research into aspirations and experiences of teaching students from the University of Wollongong (Booth & Runge, 2005); detailed analysis of law graduates destinations (Vignaendra, 1998); exploration of the views of graduates from the University of Melbourne (James, 2001); and a study of management student perceptions at Victoria University (Licciardi & Miller, 2004).

Of note in these various analyses is that graduate experiences and destinations do vary considerably by field of education. The most accessible information allowing comparison across different fields is available from the GDS. The details from the most recent survey shows that in the initial period following graduation, labour market outcomes ranged substantially by field of education. For areas of current high demand such as mining engineering, nursing, medicine and pharmacy, there was close to full employment of graduates. Conversely in degrees with less vocational focus, such as the social sciences and life science, or waning employment demand, such as computer science, lower proportions of graduates has successfully entered the labour market (Graduate Careers Australia, 2007; Griffith & Guthrie, 2007).

Across all of this Australian research, the emphasis to date has been on tracking the pathways immediately after graduation. An exception is the recent work by Marks (forthcoming) based on longitudinal data from LSAY. It analysed the school-to-work transition of the Year 9 class of 1995 up until 2005, when most were aged 24 years. Among the variety of post-school pathways examined, university study was associated with the highest earnings and occupational status, even at this early stage of young people's careers. Multivariate analyses indicated that a bachelor degree qualification increased earnings by about 30 per cent, net of other factors. However, data were only available from graduates for two or so years following graduation, and the LSAY sample size was not large enough to examine differences by field of study or institution.

Most of the Australian research that has explored the outcomes of graduates over a number of years following completion of their degree is generally related to specific fields of education. A study from the University of Wollongong examining the aspirations of teacher graduates two years after entering the labour market (Booth & Runge, 2005) is typical of the research into longer-term employment outcomes of graduates that is currently available in Australia. Findings from this and other similar scale projects that trace careers for a number of years have generally shown that

aspirations and expectations in relation to the type of work and remuneration generally change notably among graduates once they have been in the labour market for a number of years. The studies in this regard are small, however, and are almost exclusively related to a single field within one university. Therefore, in a wider context, it is not possible to compare outcomes across fields of education, institution or geographic region for graduates a number of years on from university.

As this brief survey of existing research suggests, the Graduate Pathways Survey substantially expands the body of knowledge in Australia in this regard. With variables such as field of education, institution, home location both before and after university, and employment situation at three points in time over the first five years following graduation, this data provides a rich foundation for current and future analyses of university outcomes and graduate careers in Australia.

Insights from international research

While research in this regard has to-date been limited in Australia, there are a number of long-term, large-scale projects in other parts of the world that do examine the post-university destinations of graduates for a number of years following completion. In particular, work undertaken by the Department for Education and Skills in the UK, the National Centre for Education Statistics in the USA and the European Commission's REFLEX (Flexible Professional in the Knowledge Society) project provide relevant reference points for the current study. In addition, other projects undertaken in Canada and Europe provide insights into graduate outcomes and comparisons of outcomes across different jurisdictions.

Research in the UK that has followed the early labour market experiences of graduates three to four years after leaving university has revealed that career progressions can be relatively slow, even 'leisurely', following graduation. For many it is not until a few years after leaving university that the benefits of university study on labour market outcomes become noticeable (Purcell et al., 2005a: 47). This finding in particular highlights the importance of monitoring career progression among graduates in order to gain a more complete understanding of the benefits of a university degree and the trajectories taken by graduates from a range of backgrounds.

In general, findings across the international research into early career graduate outcomes are surprisingly consistent. Key studies undertaken across the world into graduate outcomes between three and ten years after leaving university indicate that university graduates are very well placed in the labour market (both in terms of participation and remuneration), are likely to have undertaken some further education following graduation, were satisfied with their degree, and are satisfied with their employment situation.

As with the Australian research into early employment outcomes following graduation, research from the UK of graduates three to four years on (Purcell et al., 2005a), Canada (Finnie, 2000, 2004) and a number of European countries five years after graduation (Allen & van der Velden, 2008; Little, 2008), and the USA 10 years on (Bradburn, Nevill, & Forrest Cataldi, 2006) indicates that university graduates have great success in gaining full-time employment. In addition to this, the research reveals that the employment situation of graduates is also closely linked to their chosen long-term career paths. Purcell et al. found that of all graduates included in their large UK sample three to four years after graduation, 70 per cent of men and 66 per cent of women were in full-time employment related to their long-term career plans.

While obtaining a university degree is shown in the international research to be acutely important in establishing successful career prospects, the findings from these studies also reveal that a large proportion of graduates had undertaken some form of other education following their graduation. In the Canadian context, Finnie (2004: 55) argues that "prevailing labour market conditions appear to

play a significant role in this dynamic". The USA work by Bradburn et al. (2006) found that 40 per cent of bachelor's degree graduates had enrolled in a graduate, masters or doctoral degree program within ten years of graduation. In addition, the large UK study found that after four years, a 'significant minority' (7 to 8 per cent) of bachelor graduates were in postgraduate study and a large proportion (57 per cent) had undertaken some form of education or training related to their career (Purcell et al., 2005a).

Figures from the REFLEX project, examined by Little, also show that within five years of university completion, the majority of graduates in the European countries that the project covered had undertaken work-related training (Little, 2008). While for some graduates, this further training involved university study, for many, it related to other forms of education and training.

The large-scale international surveys conducted a number of years after graduation also reveal that graduates satisfaction with their initial degree and with their current employment situations were very high. In the UK, only 3.5 per cent of graduates indicated that they would not have entered higher education if they had the opportunity to change how their lives had progressed (Purcell et al., 2005a), 90 per cent of the USA cohort 10 years after graduation indicated that their degree was worth the time, cost and effort (Bradburn et al., 2006), and Canadian graduates 'expressed high levels of overall satisfaction with their educational choices' (Finnie, 2004: 55). In addition, 78 per cent of the USA cohort agreed that their degree prepared them for their work and career (Bradburn et al., 2006), and the majority of UK and Canadian subjects were employed in jobs that were appropriate to their qualification. Likewise, the European REFLEX project showed that most graduates felt the skills they had were utilised in their employment (Allen & van der Velden, 2008). Overall, graduates in these four major studies were also satisfied with their current employment, be it three to four years (UK), five years (Canada and Europe) or ten years (USA) after graduation.

Also of interest from the point of view of the Australian Graduate Pathways Survey are findings relating to changing jobs during the early years of graduate employment. In this area, the REFLEX projects findings – which are specific to a 'five year out' cohort – showed that 70 per cent of the UK cohort of graduates had left the first job they had gained after graduation (slightly higher than the European average of 59 per cent) (Little, 2008: 384). This study also found that within five years of graduation, graduates in Europe had, on average been with 2.3 employers (the UK figure was slightly higher at 2.6 different employers).

These findings, alongside others from Scotland (Futureskills Scotland, 2006), Northern Ireland (Purcell, Elias, Davies, & Wilton, 2005b), the USA (Rogers & Mentkowski, 2004) and Europe (Schomburg, 2007; Teichler, 2007) offer some key insights into the career trajectories of graduates. In the vast majority of cases, the story from the graduate perspective appears to be very good, regardless of country or number of years since completion.

However, there are nuanced differences within the research findings which mean that the need for such research in Australia is pertinent. Comparative research into graduate destinations in Europe (Schomburg & Teichler, 2006; Teichler, 2007) has shown that there are differences between countries in the careers advice and subsequent labour market progression of higher education graduates that need to be understood in a national context in order to stimulate effective policy as regards higher education provision. The Graduate Pathways Survey will provide interesting new comparative data from Australia which can be measured against these international findings.

New perspectives for policy and planning

The conceptual reach of the GPS is broad, and it therefore has implications for planning and policy development, both at the system level and within institutions. Building and taking full advantage of

this new perspective will take time, and require further consultation, analysis and reflection. For current purposes, the following discussion spotlights a handful of areas of particular relevance to contemporary contexts and the remainder of this report.

Enhancing Australia's professional workforce

Enhancing understanding of graduate employment outcomes is perhaps the main context surrounding the Graduate Pathways Survey. By providing information on what graduates do in the years following graduation, survey results provide evidence that institutions, government, industry and potential students can use to set their plans and engage in education and work.

A university degree, and the higher order skills that it confers, is increasingly important for securing employment in the Australian labour market. Currently, growth in occupations that require a university degree is greater than growth in any other occupation type in Australia (Birrell, Edwards, & Dobson, 2007). Employer demand for professional workers is currently high, and professional and managerial occupations almost exclusively rely on university-qualified persons (ABS, 2004). Therefore, the importance of a robust, well-equipped university graduate cohort is crucial to meeting the employment demands of the Australian labour market.

Over recent decades there have been steady increases in the education levels of Australians. Noting that the percentage of 25-34 year olds with at least a bachelor's degree had increased from 14 per cent in 1995 to 29 per cent in 2006, the Productivity Commission (2006: 248-249, 256) recently observed:

> The population of the future will be much more highly educated as current levels of achievement flow through the age structure over time. Australia has high levels of educational attainment relative to many other OECD countries, and it is likely that the increases in attainment that have occurred over the past couple of decades will contribute to higher participation and productivity in the future.

The professional workforce in Australia has grown faster than any other occupational grouping over the past decade and does not appear to be waning. Figures from the ABS Labour Force Survey detailed by Birrell and Edwards (2007: 4) show that the number of persons employed in a professional occupation grew by 330,000 in the period 2000-01 to 2006-07. In total, nearly two million people in Australia are now employed in a professional occupation. Put in context, the growth in professional employment accounted for 26 per cent of all jobs growth in this period. In addition, the increase in managerial occupations accounted for a further 17 per cent of the growth in Australian employment between 2000-01 and 2006-07.

Concurrent with overall growth in university graduate numbers, however, there is continuing evidence that insufficient numbers of graduates are being produced in particular fields. Recent analysis of industry demand for higher education graduates in Victoria predicts serious shortfalls in the numbers of highly skilled persons over the next 15 years. It forecasts a net shortfall of 49,000 graduates by 2022 in Victoria, with particular concerns in the supply in the science and engineering fields (Shah, Cooper, & Burke, 2007). Other research into the supply of graduates in Australia has also found evidence to support these concerns (Birrell, Edwards, Dobson, & Smith, 2005; Birrell & Rapson, 2006).

Despite these findings, some commentators on graduate supply and workforce projections argue that the solutions to filling the skills gaps are not in boosting the training effort in Australia, but instead making sure all those who have university qualifications are utilising their skills sufficiently. Research by Norton (2007) indicates that a large number of graduates in Australia are not currently employed in 'graduate occupations'. Norton argues that if these people's skills were utilised, there

would be no shortfall in highly skilled workers in most occupations in Australia. While this argument relating to the 'over-qualification' of the Australian population is not well supported generally, it is an issue of relevance that is addressed in this research project.

Considerations such as those sketched here are central to the 2008 Graduate Pathways Survey. They have shaped survey design and help interpret survey outcomes. GPS results can inform plans for developing Australia's professional workforce, understand how to manage and resolve particular skills shortages, and monitor whether graduates' skills are being used in the most productive ways.

Understanding graduate skill needs

Discussions relating to graduate destinations inevitably involve reference to the kinds of skills that graduates are required to possess, or should be developing in the early years of their careers. Skill requirements are often voiced by employers, who typically seek graduates that are 'work ready'. The consultations undertaken for this study affirmed that employers recognise distinctions between university and vocational education, but also that employers do expect that bachelor degree education will prepare individuals for the world of work.

Increasingly, universities are responding to these expectations through the specification of graduate attributes. In addition, the Australian Government is working towards building an understanding among students, universities and employers about the expectations and skills acquired by graduates (see, for example, the introduction of the Higher Education Graduation Statement (Gillard, 2008; James & Meek, 2008)).

While the current project is not designed to identify or analyse these skill requirements, it does explore several issues of direct relevance to this matter and has the potential to inform thinking in this area. The 2008 GPS looks at graduates' perceived learning and development outcomes along with related areas in which university education may be improved. As the following chapters report, it also examined the relevance of study for work, alignment between academic disciplines and industry and occupation, and graduates' satisfaction with their employability and skills.

Literature in Australia and across the western world suggests that when it comes to identifying key skills that are employers seek in graduates, ideas about generic 'work readiness' and 'soft' skills are seen to be as important (if not more important) as technical and cognitive skills – so called 'hard skills' (Coll & Zegwaard, 2006; Precision Consulting, 2007). This position was affirmed by the consultations undertaken in the early part of this study.

'Hard' skills include technical, analytical and appreciative skills. Technical skills relate to the specific ability to apply learned expertise to a task – such skills are often very specific to the course and subject matter taught at university. Analytical skills relate to problem identification and problem solving, while appreciative skills relate to the ability to evaluate and make appropriate judgements about complex situations (Coll & Zegwaard, 2006). These latter two skills are less related to the specialist skills taught in a particular university course, but they are skills that are formed specifically through the training and experience provided at university.

'Soft' skills are a combination of personal, interpersonal and organisational skills. While these types of skills are not necessarily the 'learned' skills that universities are able to base curricula around, they are highly sought after by employers. Coll and Zegwaard (2006: 31) define personal skills as relating to the way an individual handles various situations, interpersonal skills as being about securing outcomes through interaction with others, and organisational skills as understanding workplace dynamics and being able to solve problems by utilising organisational networks. These skills are "primarily affective in nature and are associated with the related emotional quotient,

comprising a blend of innate characteristics and human, personal and interpersonal skills" (Coll & Zegwaard, 2006: 29). Among these skills, "the single most desirable skill is ability and willingness to learn" (Coll & Zegwaard, 2006: 29). In the workforce, these 'soft' skills translate into greater ability to communicate and work in a team they also contribute to the ability to recognise the adaptability of technical skills, so that organisational and commercial opportunities can be more readily recognised.

Employers show interest in both the 'hard' and 'soft' skills of graduates (Mason, 1999). As noted above, the 'hard' skills tend to be those on which university courses have traditionally been focused. However, as industry increasingly articulates its interest in the 'soft' skills, universities are finding ways in which to tailor courses which enhance many of these seemingly innate characteristics.

In Australia, the Employability Skills Framework, developed by the Australian Chamber of Commerce and Industry and the Business Council of Australia, and with input from ACER, (Department of Education Science and Training, 2002) is widely recognised by universities and adapted to suit individual institutions' profiles of their core graduate attributes. The Employability Skills Framework identifies eight core employability skills: communication, teamwork, problem solving, self-management, planning and organisation, technology, lifelong learning, and initiative and enterprise.

Likewise, earlier Australian research comprising a survey of graduate employers carried out by Graduate Careers Australia (Guthrie, 1994: 3) identified four key skills and attributes desired by employers of recent university graduates: cognitive attributes and skills, communication attributes and skills, interpersonal attributes and skills and work organisation/situation attributes and skills. There are close similarities in these two Australian examples with the skill sets identified by researchers in the cross-national REFLEX project. Five key 'areas of competence' identified in the REFLEX project have been labelled professional expertise, functional flexibility, innovation and knowledge management, mobilisation of human resources, and international orientation (Marshall, 2008).

The skill sets identified in these three separate studies have nuanced differences, but key similarities. They all span both the 'hard' and 'soft' areas identified above, however there is a definite emphasis in all on the 'soft' skills – which as noted above are more affective and therefore much more difficult to teach. These key attributes that make up a desirable graduate therefore rely as much on personality and innate characteristics as on learned skills that universities are able to offer.

The implications of these findings for the current research project are interesting. The Graduate Pathways Questionnaire is able to identify the extent to which graduates believe their university course influenced their skills and personal development in a range of 'hard' and 'soft' skills. It also asks graduates to identify the extent to which their course helped to prepare them for their employment at one, three and five years post-graduation. Examination of the relationship between employment opportunities, skills development, participation in further education and training, and course and institution type will help to provide new insight into the necessity, application and learning of these skills among Australian university graduates.

Enhancing equity and social inclusion

In addition to the wider labour supply issues relating to university completions and employer skill requirements, an important facet in exploring the destinations and pathways of university graduates in Australia is the extent to which specific equity groups have different experiences in the labour

market on completion of their degrees. To enhance productivity, Australia needs policies and practices which help all talented people obtain a university qualification. It is vital, in particular, that a person's background does not inhibit their chance of participating in higher education, and that all students they are offered support that will help them succeed.

So far, in the Australian context, there has been relatively little research pertaining to pathways of graduates by from key equity groups. The focus of much research on equity until now has been predominantly on the entry into university rather than their destinations upon completion. Despite the existence of a national equity policy, the existing research relating to equity and entry to university has shown that students from disadvantaged backgrounds are persistently less likely to participate in higher education than other students (Centre for the Study of Higher Education, 2008; Edwards, 2008; Edwards, Birrell, & Smith, 2005; James, 2002; James, Baldwin, Coates, Krause, & McInnis, 2004; James, Baldwin, & McInnis, 1999; Lamb, 2001; Le & Miller, 2005).

Data from the GDS and the Longitudinal Survey of Australian Youth (Marks, 2007) shows that for those disadvantaged students who do gain entry to and complete university, outcomes in terms of employment are relatively similar to the general university population. For the key equity groups of focus to this project, the GDS figures show employment outcomes for regional students are similar to those from metropolitan areas, as are those for Indigenous graduates when compared to the rest of the population. Detail on graduate outcomes by a measure of socioeconomic status is not carried out in the GDS and such information is therefore limited in the Australian context.

However, analysis of data from the Longitudinal Survey of Australian Youth by Lamb (2001: 15) found that "the pathways of low SES and high SES school leavers suggest that while the differences are not large, more low SES students experience difficulties in making the transition to full-time work". Like the GDS data, the Longitudinal Surveys of Australian Youth analysis by Lamb was limited in that the subjects of the research were relatively recent graduates and therefore their connections with the workforce were still being established.

The current research into graduate pathways five years after university, helps to enhance our understanding of the effect disadvantage has on graduates and their labour market fortunes. It provides new evidence to examine whether the post-university pathways of students belonging to equity groups are any different from other students. If, as the GDS outcomes suggest, equity groups do not experience labour market transitions any differently to other graduates, then there is additional evidence to justify policies designed to increase the participation of certain equity groups in Australian universities. If as the LSAY data suggests, there are some nuanced differences in career trajectories linked to individual background characteristics, then there is evidence to suggest increasing support for graduates from key equity groups so as to help with transitions and career development.

Insights into educational quality

Understanding the quality of education is a highly complex activity, and has proved particularly difficult at the tertiary level. The diversity of universities, teachers, students, programs and operating contexts inhibits simplistic evaluation of processes or outcomes. A large number of approaches have been designed and implemented over the years (Anderson, Johnson & Milligan, 2000; Coates, 2009). While it seems that a multifaceted approach will always be required, a growing emphasis is being placed on approaches which can be described as 'evidence based' and 'outcomes focused' in nature (Coates, 2007a, 2007b, 2007c). The Graduate Pathways Survey has the potential to make an important contribution in this regard.

It is often observed that the outcomes of a university education can take many years to develop. Many learners, particularly bachelor degree students, undertake study at a formative stage of their individual development. Of course, many if not most participate in university study due to its potentially transformative effects. Many of the technical competencies taught at university may take years to consolidate and master. Likewise, while it is desirable that graduates are 'work ready' on graduation, it may take a considerable period of time before they are genuinely acculturated into communities of professional practice.

Looking at graduates' pathways and outcomes in the first five years beyond graduation offers a unique perspective on the outcomes of university education. It helps look beyond the employment and further study outcomes that immediately follow the completion of a degree at the broader relevance of bachelor degree study to professional work. This helps understand the patterns within graduate career pathways, particularly relations between field and industry, the capabilities of university graduates within the Australian labour market, the labour market expectations of university graduates, and the range of pathways taken by university graduates from different fields of education, socioeconomic backgrounds, geographical locations, and higher education institutions.

In addition, collecting data from graduates after a period of years provides an opportunity for these individuals to provide feedback on their university experience. It helps understand the perceptions of the benefit of a university education among graduates, and their satisfaction with university education in terms of developing capabilities required for work. Such insights provide a useful complement to those provided by currently enrolled students and recent graduates.

While the 2008 Graduate Pathways Survey has the potential to add value to our understanding of the quality and relevance of university education in Australia, it is important to offer a few preliminary notes of caution on this front. Population considerations and fieldwork practicalities mean that it is difficult to interpret results at the level of the individual institution. This is partly due to the resources, infrastructure and processes available at institutions to collect data from graduates which, so far, has an unknown effect on survey processes and outcomes. Of course, five years is a reasonable period of time, and it is likely that a range of other factors may have mediated graduate outcomes in addition to those which are specific to individual institutions. For current purposes, therefore, quality matters are analysed and reported at the level of the overall system.

Angelo comes from a Spanish-speaking family and started university in 1998 at the age of 20. His father was an electrical engineer and his mother a housewife. He majored in zoology as part of a science degree at a large capital city university, motivated by both family expectations and by interest. His marks ranged in the mid 70s. He was happy with her university study, reporting high level of achievement in terms of work-specific skills, but less so in terms of general forms of personal and professional development. In general, he was happy that it provided a good general knowledge about biological terminology and a good general knowledge of the field.

In 2002 Angelo secured part-time work as a research assistant at the university where he studied, while at the same time enrolling in a masters coursework degree. His salary in this casual role was $20,000. The role had a good fit with his study and he saw himself continuing to work in the areas for a few more years. In 2004, by using his internal networks, he increased his hours to 60 and his salary to $45,000. In 2006, with postgraduate qualification in hand, he secured a fixed-term post paying $83,000. The work made use of his capabilities, but he was interested in pursuing doctoral study rather than seeing himself work in the position for another three to five years.

3 ANALYTICAL CONTEXTS

> [The most relevant aspects of the degree were] practical studio work; workshops/teaching by visiting professionals; relationships with staff and peers; good workspaces; external visits to professionals in the field; good technical support… (69 year old female visual arts and crafts graduate)

> There are no areas of study that have not been relevant [to my graduate work] (29 year old female chemistry graduate)

> The foundation of knowledge gained in the field I studied is very relevant. Interacting with other students and learning on the job were beneficial. (32 year old female marketing graduate)

Introduction

The Graduate Pathways Survey was designed to capture a large amount of policy relevant data in an efficient manner. This required development of a well-designed set of survey resources and processes, nimble management of a national collection, and focused analysis of a large amount of complex data.

This chapter surveys key aspects of GPS methodology to provide foundation for the results chapters that follow. It provides key information about the population and yield of secured results. It reports and explores the main variables considered in the analysis.

The appendices and attachments to this report complement the current overview. A detailed methodological description of the project's approach is provided in Appendix B. The 2008 Graduate Pathways Survey Institution Administration Manual offers further detailed operational information. Other relevant attachments include the 2008 Graduate Pathways Questionnaire (GPQ), and the Graduate Pathways Questionnaire 2008 codebook.

It is useful to note that the Graduate Pathways Questionnaire itself was designed to offer graduates a structured opportunity for reflecting on the educational experience and life beyond university. With this in mind, a review of the instrument (provided as an attachment or at www.acer.edu.au/gps) offers helpful background to reading the results presented in following chapters.

Population and sample

The 2008 GPS involved a census of domestic 2002 bachelor degree graduates. All Australian universities participated in this study. The generalisable population for the study was defined by the 2003 Past Course Completion File (DEST, 2004). This population included a total of 98,535 bachelor degree graduates, comprising 86,303 pass degree graduates, 8,221 honours graduates and 4,011 graduates in graduate entry programs. This population excluded 10 graduates from the Batchelor Institute of Indigenous Tertiary Education (which discontinued from the study during fieldwork) and included 331 graduates from Bond University. While the generalisable population was 98,535, the target population was only 76,346 as 22,189 graduates were excluded from the frame. Details of these exclusions are provided in Appendix B.

A total of 9,238 graduates returned a usable response. The national response rate was therefore 12.1 per cent, which varied from 3.6 per cent at one institution to 63.4 per cent at another. The response yield is sufficient to produce national estimates – the intended level of analysis, as well as estimates for many subgroups with desired levels of precision.

The achieved response rate of 12.1 per cent was close to the 15 per cent target specified by ACER in the study's design. A range of validation procedures were designed to build confidence in the data, results, project findings and outcomes. Detailed information was compiled on the population defined by the 2003 national files as well on the population produced via the lists supplied by institutions. Detailed information on the response process was collected to build understanding of the characteristics of response. This information was used to prepare post-stratification weights that ensured the distribution of key variables in the response data mirrored that in the population. A comparison of key marker variables against ABS Census figures was also conducted to affirm the representativeness of the data.

These validation activities were important part of the study's design and delivery. Given this is the first time that such data has been collected, however, the scale of any bias due to non-response is uncertain and the results should be treated with caution. Further, as outlined in recent national reports of the graduate Course Experience Questionnaire (GCA & ACER, 2008, 2007, 2006) despite the census approach the relatively low response rate means that it is appropriate to adopt a sampling perspective and treat the results in this report as statistical estimates rather than population parameters. For clarity, only point rather than interval estimates are reported in the following chapters. To provide greater confidence in the results, however, readers should place margins of error around the reported results and treat them as indicative not definitive.

Table 1 and Table 2 present course and demographic characteristics for the generalisable population (where available), and of the secured sample of responses. As discussed in Appendix B, the generalisable population (as opposed to the target population, which excludes certain graduates) for the 2008 GPS is the 2003 DEST Past Course Completions file (DEST, 2004). (Note that the size of the generalisable population is 98,535 but detailed information is not available for the 331 graduates from Bond University, so the totals in Table 1 and Table 2 sum to 98,204.) For the sample, both unweighted numbers and weighted (by field and sex) numbers and percentages are shown. Given the relatively large size of the weights (ranging between 0.11 and 112.0 with mean of 11.3) and rounding, the absolute number of responses appears higher in the weighted data than in the generalisable population.

Detailed analysis and validation of the sample against both the DEST Past Course Completions file (DEST, 2004) and the 2006 Australian Census (ABS, 2007) is undertaken in Appendix B. Using the figures in Table 1 and Table 2, comparison of the population and weighted sample percentages show that the sample is highly representative of the target population in terms of university group, field of education, sex and ATSI. The sample includes slightly more respondents with disabilities than the population, includes fewer people who do not have English as their language background, includes slightly more people who studied as full-time and internal students, and includes slightly more older students. Overall, these comparisons, underpinned by the more extensive analyses reported in Appendix B, confirm that it is possible to have confidence in the GPS data and results.

Table 1 GPS 2008 sample education characteristics

		Target Population		Sample		
		N	%	n (un-weighted)	n (weighted)	% (weighted)
Total		98,204	100	9,238	104,303	100
University group	Go8	29,881	30	2,835	31,634	30
	ATN	17,848	18	1,632	19,077	18
	IRU	15,064	15	1,847	16,087	15
	Regional	12,763	13	1,336	13,602	13
	Metropolitan	22,648	23	1,588	23,903	23
Broad field of education	Natural and physical sciences	9,253	9	787	9,613	9
	Information technology	5,551	6	565	6,240	6
	Engineering and related technologies	5,308	5	359	5,344	5
	Architecture and building	2,293	2	157	2,316	2
	Agriculture and environmental studies	2,240	2	396	2,527	2
	Health	13,499	14	1,476	14,195	14
	Education	11,591	12	1,114	11,894	11
	Management and commerce	18,564	19	1,563	20,136	19
	Society and culture	22,220	23	2,277	23,911	23
	Creative arts	7,685	8	536	8,052	8
Completed degree in preferred field	No			649	7,565	7
	Yes			8,524	95,928	93
Distributed study	Full-time internal	60,633	62	6,150	70,716	68
	Distributed study	37,571	38	3,088	33,586	32
Paid work hours per week	None			1,641	17,716	17
	1 to 10			1,903	21,292	21
	11 to 20			3,229	36,872	36
	21 to 30			1,205	13,959	13
	31 or more			1,201	13,808	13
Average overall grade	50 to 59			274	3,337	3
	60 to 69			1,716	20,762	20
	70 to 79			3,797	42,455	42
	80 to 89			2,702	29,498	29
	90 to 100			538	5,946	6

Table 2 GPS 2008 sample demographic characteristics

		Target Population		Sample		
		N	%	n (un-weighted)	n (weighted)	% (weighted)
Total		98,204	100	9,238	104,303	100
Sex	Male	38,989	40	2,655	38,786	40
	Female	59,215	60	5,966	59,368	60
Age group	20 years or younger	1	0	7	98	0
	21 to 30 years	72,930	74	5,425	62,894	64
	31 to 40 years	14,677	15	1,489	16,828	17
	41 year or more	10,596	11	1,695	18,308	19
Language background	Non-English	17,456	18	493	7,057	7
	English	80,748	82	8,107	90,826	93
ATSI status	Not ATSI	97,530	99	8,542	97,212	99
	ATSI	674	1	60	667	1
Disability	No	95,113	97	7,975	90,874	94
	Yes	3,091	3	529	5,906	6
Primary school locality	Metropolitan			5,773	67,800	71
	Provincial			1,979	20,756	22
	Remote			187	1,798	2
	Overseas			490	5,464	6
Primary school SES	Lowest 25%			1,350	14,928	17
	Middle 50%			3,115	34,716	41
	Top 25%			3,047	36,006	42
Father occ level	Non professional			4,319	49,323	53
	Professional			3,835	42,939	47
Mother occ level	Non professional			6,230	70,623	75
	Professional			2,053	23,305	25
First in family (parents)	Not first in family			4,597	51,073	49
	First in family			4,641	53,229	51

Instrument and variables

ACER designed, developed and validated the Graduate Pathways Questionnaire (GPQ) as a resource that could be used in future data collections. Development of a validated GPQ, as opposed to a document that contains a list of untested questions, was seen to be of considerable ongoing value to Australian higher education.

The GPQ measures a series of individual and contextual input, process and outcome factors. It captures data that can help build understanding of how these factors shape bachelor degree graduates' transitions and academic and employment outcomes in the first five years after graduation. It invites graduates to respond to questions under a number of headings. The headings were ordered to facilitate graduate's recollections and recall, enable efficient design and presentation, and minimise the analytical impact of response interference effects such as fatigue. The five sections are:

- Your 2002 bachelor degree(s)
- Your activity in April 2008
- Your activity in April 2005
- Your activity in April 2003, and
- About you.

A copy of the 2008 GPQ is provided as an attachment to this report. The instrument contained around 160 items. While many of these are designed to be analysed as they are presented to graduates, others are designed to be used to derive various discrete and composite (commonly

referred to as ‘scales’) variables. Table 3 lists the main discrete and composite variables analysed in the following chapters.

Table 3 Variables included in the analysis

Demographics	Educational contexts	Post-graduation activities
Sex	Study influences	Main activity
Age	University group	Education activity
Citizenship	Field of education	Work seeking activity
Main home language	Degree in preferred field	Work activity
Indigenous	Degree start date	Work industry
Disability	Attendance mode and type	Work country
Regionality	Hours in paid work during study	Occupation
Family disadvantage	Average overall grade	Work start date
Current disadvantage	General learning outcomes	Contract duration
Highest qualification	General development outcomes	Hours per week
Sibling education	Satisfaction with study	Annual salary
Parental education	Relevance of study	Work satisfaction
Parental occupation	Areas for improvement	Employment strategies

While Appendix B provides a detailed overview of these variables, a few initial comments are made here to provide a background to the chapters that follow. As Table 3 shows, the 2008 GPS offered an opportunity to design and test a range of new ways of measuring individual disadvantage. New and more precise ways of measuring locality were also trialled. In addition, the study called for new ways of thinking about and measuring the outcomes of university education. As discussed in the following chapters and detailed in Appendix B, a range of new scales were developed to measure education and employment outcomes. For consistency, many scaled variables are reported on a 100-point metric. To help build the kind of analytical linkages that facilitate higher-order forms of policy analysis, formative links were made between the GPQ and a number of existing national instruments.

Juanita’s father worked as a self-employed tiler and her mother as an assistant nurse in an aged-care facility. Her father had vocational qualifications, but her mother had not completed primary school. The family was Portuguese, now living in Brisbane.

Juanita was always interested in studying education, and was very happy to be admitted to study early childhood education at a major metropolitan university. She worked for 16 hours a week to support her undergraduate studies, and achieved high marks between 80 and 89.Most aspects of her degree were useful, but she felt less confident in the development of her writing and quantitative analysis skills, and in her general industry awareness.

Juanita secured a ongoing work as an early childhood teacher straight after graduation. She worked for 30 hours a week on a salary of $41,000. She retained this role for the next five years, undertaking a few short courses to upgrade work skills, and seeing an increase in her salary to $46,000 after three years. In 2008, Juanita started a family, reduced her work to 12 hours a week and salary to $26,000. She continued to be satisfied in her role and saw herself as continuing in the position for at least another three years.

4 EDUCATION OUTCOMES

> Having to rote learn many chemical reactions etc. [was the least relevant aspects of the degree]. I can learn anything before an exam only to forget it the next day. Would have liked a better long-term learning strategy… (29 year old female chemical sciences graduate)

> [The most beneficial aspects of the degree were] meeting people and understanding other cultures. Also the ability to think critically about social issues. (25 year old male humanities graduate)

> I chose to go on to post-graduate study. My bachelor degree included a little bit about lots of different fields which put me in a good place to learn more about the areas I wanted to continue with while still having a basic understanding of other peripheral topic areas. (26 year old medicine graduate)

Introduction

Graduates have a unique perspective on their university study five years after completion of their bachelor degree. The GPQ included several items and scales that investigated graduates' perceptions of the outcomes, relevance, benefits and quality of their bachelor degree education. An overview of the scales is provided in the previous chapter and Appendix B which, along with review of the instrument itself, provides a useful background to the analysis that follows.

Learning and development outcomes

The GPQ asked graduates to rate how much they had achieved through their degree in terms of a number of general learning and development outcomes. These are the broader forms of learning and development stressed by employers during the consultations undertaken during GPS design. Graduates were also asked to rate their average overall mark. These questions were adapted from the AUSSE Student Engagement Questionnaire (ACER, 2008).

On the general learning scale, the average national score (out of 100) was 61. This is very close to the Australasian average score of 63 reported by the 2008 Australasian Survey of Student Engagement (ACER, 2008). The learning scale measures responses in relation to specific competencies such as writing, speaking, thinking and analysing. It showed that within groups of students there were some notable differences in the perception of the role of their degree on contributing to learning. Among the fields of education, Figure 2 shows that creative arts graduates had the lowest score (58), while engineering graduates recorded the most positive response (63). Graduates who completed a degree in their preferred field reported more generic skill development than others (61 compared with 55). Figure 3 shows that a person's average grade was, perhaps unsurprisingly, positively linked with their report of general learning.

Demographic factors tended to underpin less variation in perceptions of general learning, although an exception to this are Indigenous graduates. These graduates tended to be more positive about the influence of their degree on their learning development. The average score for these graduates on this scale was 67, compared with 61 for non-Indigenous graduates.

The general development items measured graduates' perceptions of areas such as the extent to which their degree helped develop contribution to the welfare of their community, develop industry awareness and understanding of social contexts. The national mean score on this scale was 45 out of 100, and around 70 per cent of the values fell between 20 and 70. A comparable value of 43 is provided by the 2008 AUSSE (ACER, 2008), which may be considered to offer a benchmark in this

area. While the variability is rather high, this figure suggests that graduates did not perceive that they had gained substantially in this regard from their university degrees.

There was considerable variation in responses among some groups of students. Go8 graduates reported less development than those from IRU institutions (43 compared with 47). Figure 2 shows that health graduates reported the highest levels of general development (52) compared with a much lower result for people who studied in the natural or physical sciences (36) or in information technology (37). As with learning, those who completed a degree in their preferred field of study saw themselves as having developed more through this degree than did others (45 compared with 39). As Figure 3 shows, average grade is less related to developmental outcomes than it is to the development of general forms of learning.

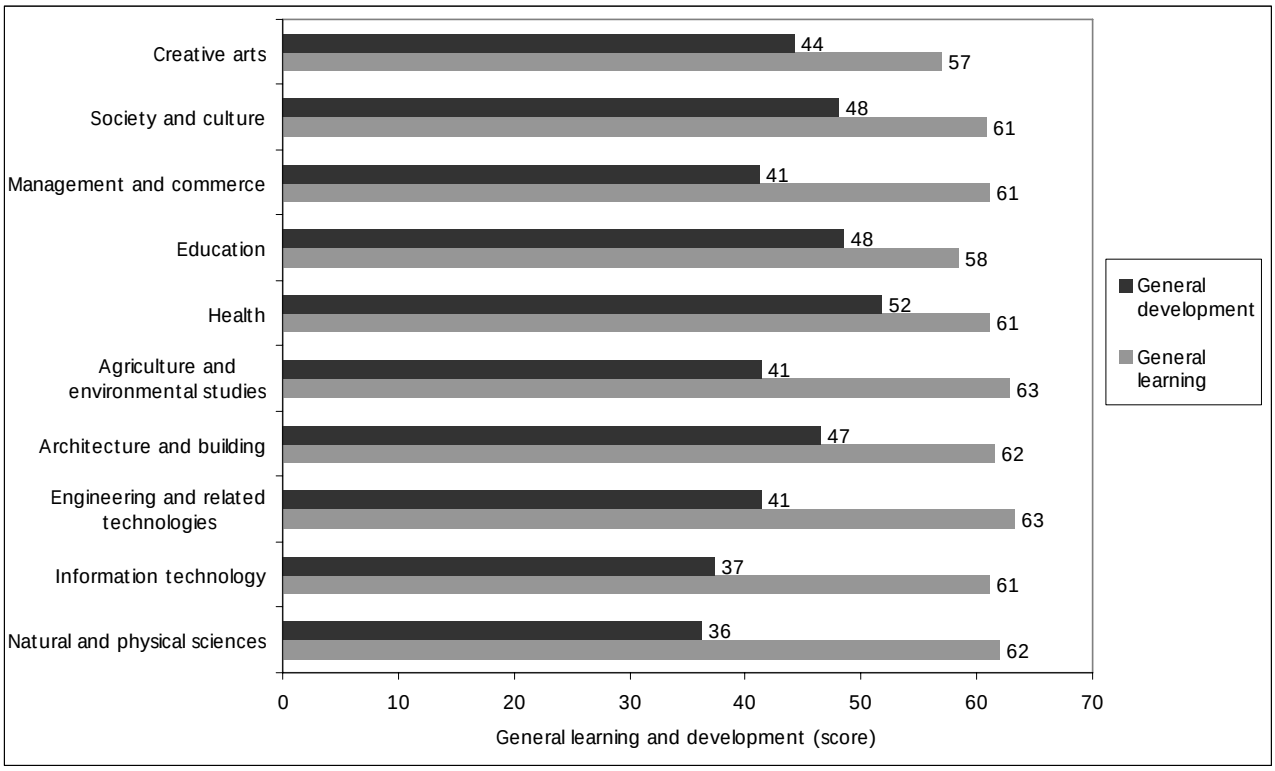

Figure 2 General learning and development by field of education

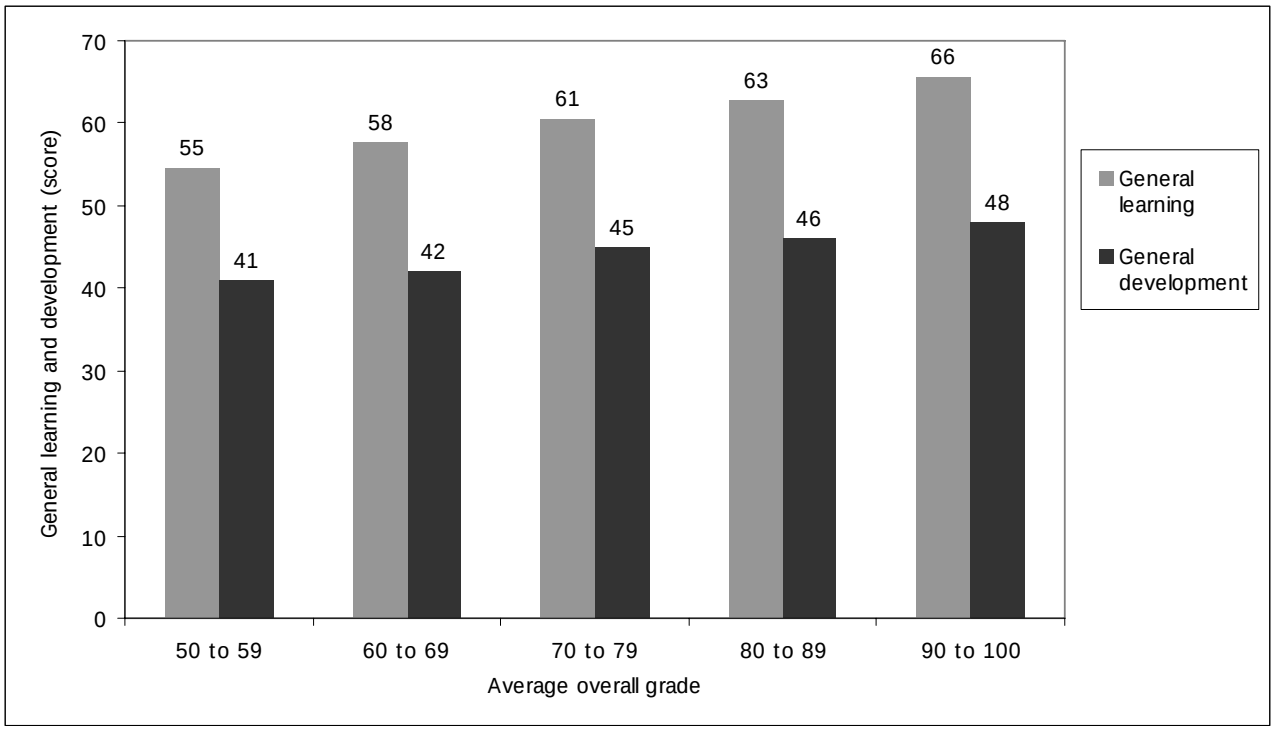

Figure 3 General learning and development by average overall grade

Notable variation was found when compared with graduates' evaluation of the careers advice they gained during their degree. As Figure 4 shows, the evaluation by graduates of the careers advice they received was positively related to their score on the development scale.

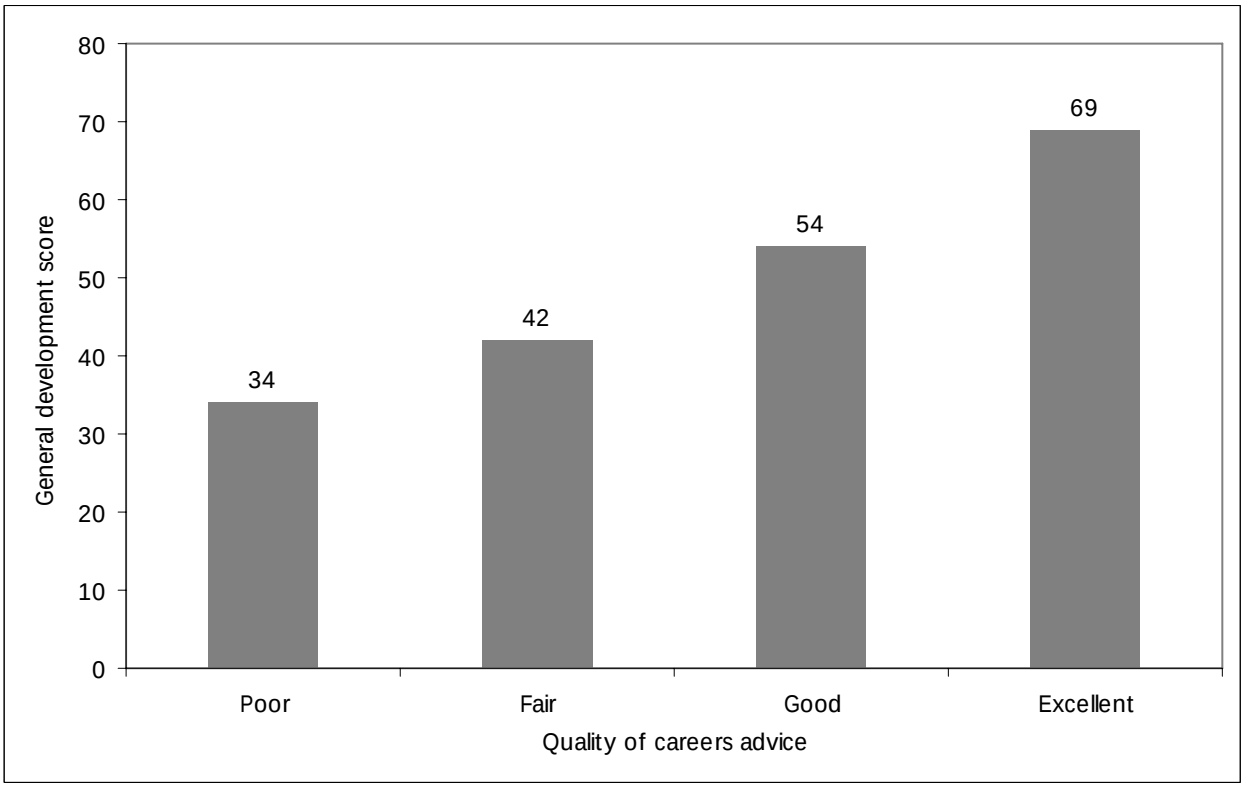

Figure 4 General development by evaluation of careers advice

The self-reported grades achieved by graduates during their degree averaged 75 across the GPQ respondents. This is on par with the AUSSE 2008 figure for Australasia of 72 (Coates, 2008). The

average grade reported was relatively consistent among different student characteristics. The lowest grades were reported by Indigenous and Non English Speaking Background students. The highest grades were reported by graduates at either end of the age spectrum – with an average of 80 reported by those under 20 years of age, and 78 by those aged over 40.

One means of assessing the value that institutions add to individuals is by assessing the relationship between individual disadvantage and educational outcomes. The GPQ included a relatively large number of items designed to measure aspects of a graduates' socio-economic status. It asked graduates to report the location they had lived in as children (postcode in the final year of primary school), and their current address, parental education and occupation. The average overall grades reported by graduates were consistent across these groups. This suggests that at the national level Australian institutions were successful in ameliorating these elements of disadvantage associated with students on entry into the system.

Key finding 2: General learning outcomes reported by 2003 bachelor degree graduates were similar to those reported by 2008 learners in the 2008 Australasian Survey of Student Engagement. Field of education was linked with graduates' reports of learning outcomes. Graduates reported lower levels of general development, although this varied across fields and institution groups. Importantly, reported educational outcomes did not vary across graduate groups, including groups representing graduates from disadvantaged backgrounds.

Perceptions of educational quality

Overall satisfaction with study

Satisfaction is a commonly used measure of the quality of university education, reflecting the extent to which graduates feel they have seen a return on their educational investment. The satisfaction scale measured by the GPQ combines a number of items relating to graduates perceptions of their degree experience overall. Results are reported on a 100-point metric which reflects a scaling of the response categories used on the instrument as 'poor' (0), 'fair' (33), 'good' (67) or 'excellent' (100).

At the national level, the average satisfaction rating was 64, and around 70 per cent of responses fell between 55 and 85. While the questions and methodology of this survey are different from international examples, it is interesting to note that overall satisfaction with degree among Canadian bachelor graduates was higher at 71 for females and 72 for males five years after graduation in a study undertaken by Finnie (2004: 51) during the 1990s. Additionally, while again a different measuring tool, Bradburn's (2006) study of graduates in the USA 10 years after completion showed that 90 per cent thought their degree was worth the time, cost and effort.

There was variance in scores on the satisfaction scale among some groups of graduates. For those who did not complete a degree in their preferred field, the average score was 52, compared with 65 among those who did study in their preferred field. Indigenous graduates had higher satisfaction scores (69) compared with others (64), while the younger and older age groups also had higher satisfaction scores than the other age groups. Figure 5 shows that there was also variation on this measure among the fields of education, with education graduates reporting the highest satisfaction (68) and creative arts graduates the lowest (59).

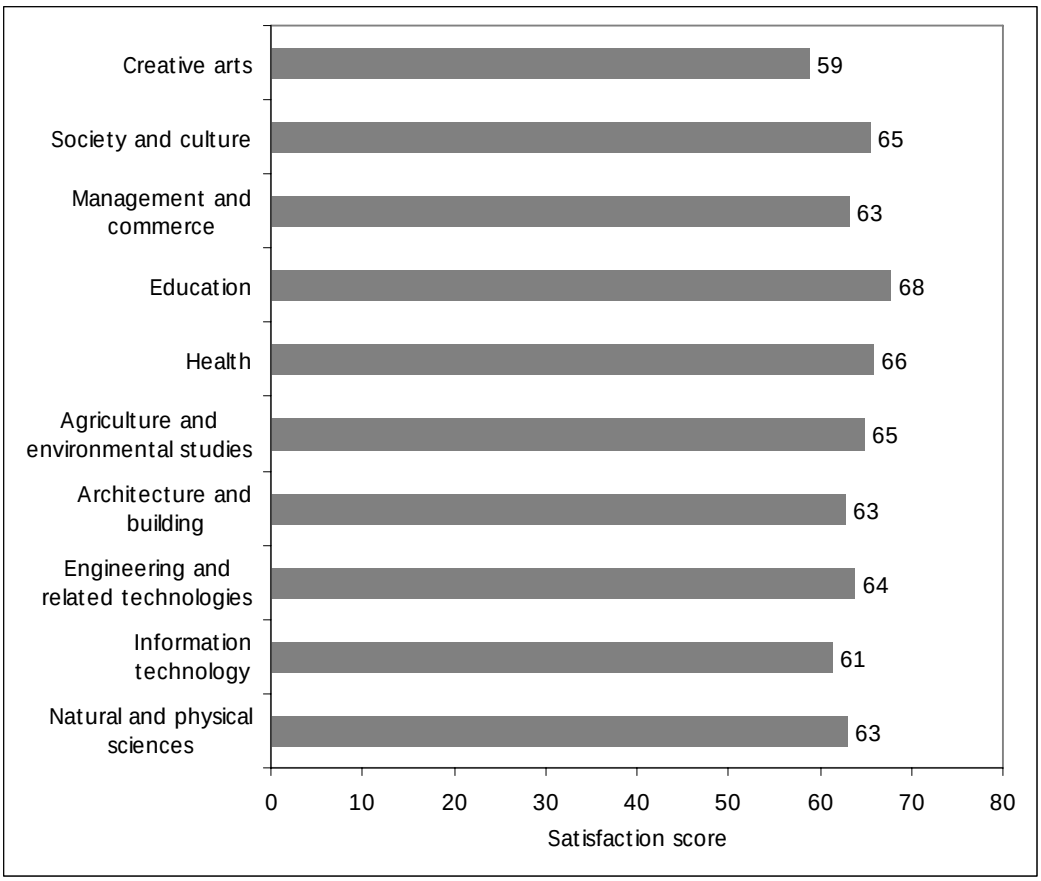

Figure 5 Satisfaction by field of education

Evaluation of the quality of careers advice was one item in the satisfaction scale. The average national score for this item was just 39, sitting just above 'fair' on the four-point response scale. Graduates who studied in the natural and physical sciences or creative arts tended to report least satisfaction with careers advice, as did those who achieved low marks or completed a degree in a non-preferred field. Health, education, and Indigenous graduates reported the highest satisfaction with careers advice, although even here the average scores were still low.

It is important to note that these findings refer to 'careers advice at your university', and not specifically to a 'careers advisory service'. Student engagement research has shown that students obtain careers advice from a range of sources at their institution (Coates, 2008), and it is this overall perspective that is measured in the GPS.

Interestingly, graduates were more likely to report that were they to start over again, they would attend the same institution again (73 on the 100-point scale) rather than redo the same degree (64 on the 100-point scale). Go8 graduates provided the highest ratings of satisfaction with the institution (77 on the 100-point scale), while those from metropolitan institutions gave the lowest (68 on the 100-point scale). In terms of degrees, the mean score for information technology graduates was 58 compared with 72 for architecture and building graduates. The mean score for education graduates (71) was also relatively high.

Key finding 3: 2003 graduates were broadly satisfied with the quality of their bachelor degree. On a 100-point scale, the average satisfaction score was 64. Intrinsic interest in the field played an important role in graduate satisfaction, as did field and institutional group.

Relevance of bachelor degree for work and study

Graduates were asked how beneficial their bachelor degree was for further university and vocational study, and to paid work in the first, third and fifth years beyond graduation.

At the national level, bachelor degree study appears to be perceived as more relevant to work three to five years out than it is in the first year. Average relevance ratings increased from 65 in the first year after graduation to 68 and 69 in years three and five. These findings are significant, for they show that as graduates' careers develop, there is a rise in the perceived relevance and usefulness of their degree. This suggests that university training has a cumulative and sustained impact on a person's career in addition to an immediate impact on their initial entry into the job market.

Among the open-ended responses to questions relating to the aspect of graduates degrees that were most relevant to subsequent work, common responses related to the inclusion of "work experience" and "practical experience" components in the coursework. In addition "working as part of a team", "interpersonal skills", "presentation skills" and "team working skills" were noted by graduates in their responses.

Figure 6 reports variation in perceived relevance of study for work by institution type. Go8, metropolitan university and IRU graduates see their work as becoming progressively more relevant across the first five years beyond degree completion. The perceptions of ATN graduates show a different pattern – with these starting from a higher base and remaining consistently higher across the five-year period.

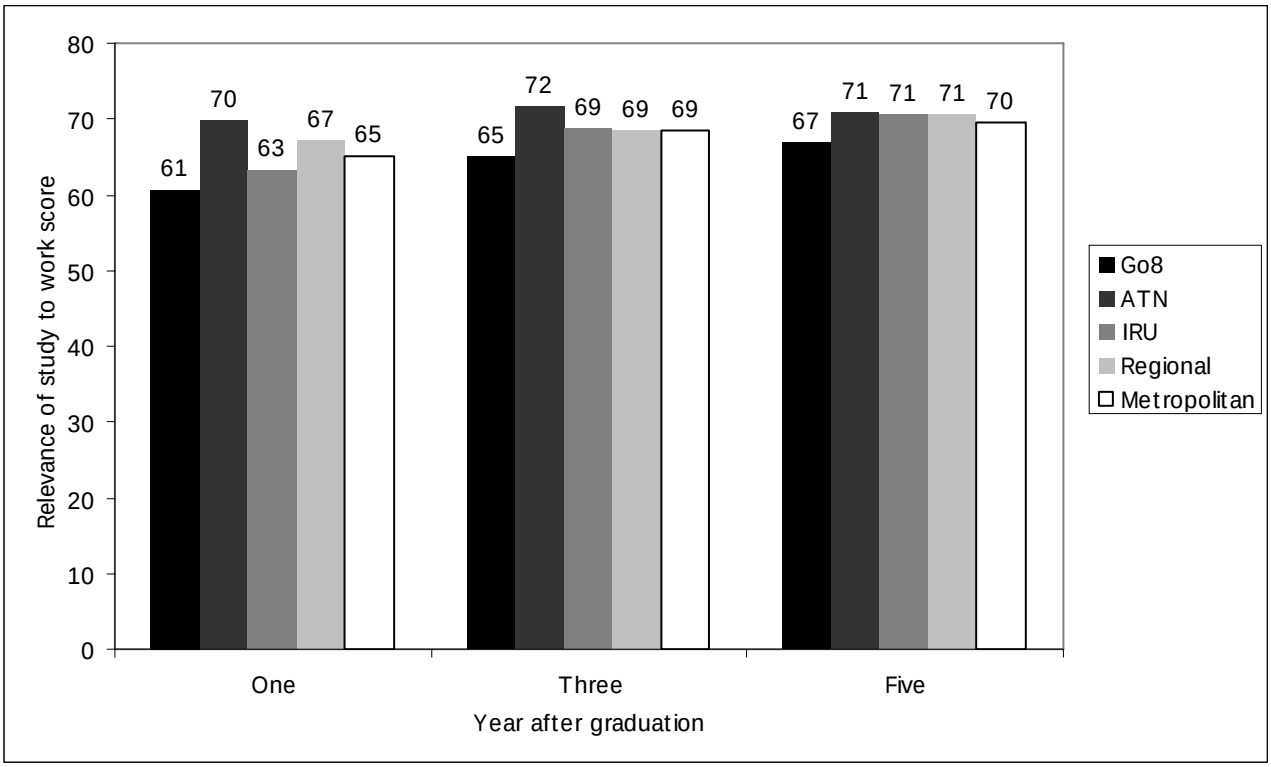

Figure 6 Relevance of study to work by institution type

There are interesting differences between fields of education in relation to the perceived growth in relevance a bachelor degree five years after completion. Figure 7 shows that the sciences, humanities and creative arts show persistent increases. In these less vocationally-specific degrees, while graduates may begin their careers after university in roles that are not necessarily a good job-

skill match to their degree, as their career develops the relevance and usefulness of their degree in their work increases.

By contrast, perceptions of relevance for professional qualifications in health, management and engineering remain relatively stable across the five-year period. There are slight declines in perceptions of the relevance of education and information technology degrees. With the exception of management and IT, graduates with professional qualifications tend to see higher levels of relevant in their degrees than do others.

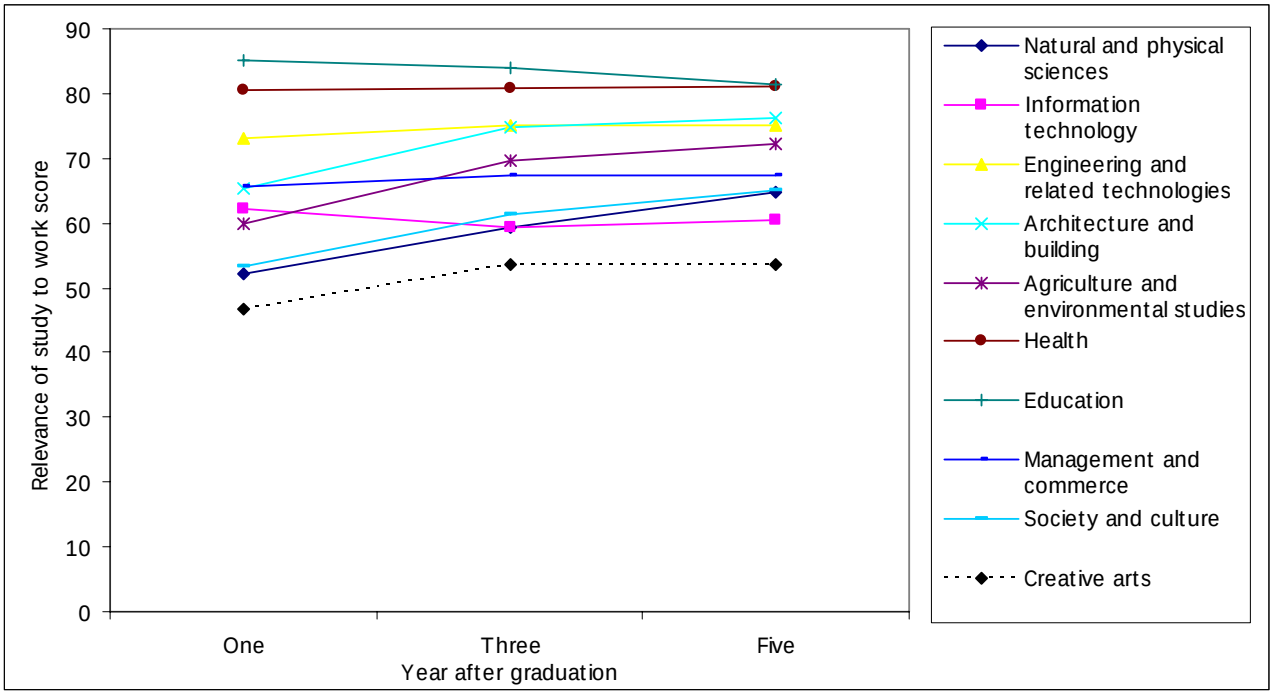

Figure 7 Relevance of study to work by field of education

People who graduated with a degree in their preferred field, who did paid work while they studied, who had higher levels of achievement, or who are Indigenous perceived their study as being more relevant than did others.

As might be expected there was a steady increase in perceptions of relevance for people who continued on to postgraduate study. There was also considerable variation among fields. Engineering, education and IT graduates tended to see their bachelor degree as less relevant to further study than did graduates from science, humanities and health degrees.

Key finding 4: At the national level, bachelor degree study appears to be perceived as more relevant to work three to five years out than it is in the first year. Perceptions of relevant varied by field, institution group and a graduates' intrinsic interest and continuation in the field. These results are significant, for they show that as graduates' careers develop there is a rise in the perceived relevance and usefulness of their degree. University training appears to have a cumulative and sustained impact on a person's career in addition to an immediate impact on their initial entry into the job market.

Areas for educational improvement

The GPS asked respondents to identify how bachelor-degree education should be improved so that it may better enhance graduates' employability and skills. The perspective of successful graduates has been shown to provide very useful feedback on areas of university education which could be

improved so as to enhance outcomes (Scott, & Yates, 2002; Scott, 2006; Scott, Coates & Anderson, 2008). Material was sourced from a review of such studies, and from insights into the characteristics that engage students in productive learning (Coates, 2006).

Twenty specific areas were measured, and these are ranked in Table 4 in order of level of importance. It is noticeable that the first six focus on enhancing the application of learning. Factors in the middle of the list tend to focus on supporting students' involvement in active and challenging learning. The lowest ranked factors tend to focus on the practicalities and convenience of study. These findings provide very informative insight on the ways in which universities might redesign educational programs to enhance learning and development outcomes.

Table 4 Specific areas for improvement

	Importance
Use real-life case studies in learning	85
Ensure that teaching staff have current workplace experience and knowledge	84
Introduce more fieldwork, placements and internships	82
Make assessment more real-world and problem based	78
Focus more on developing capabilities needed for professional success	77
Enhance careers advice	71
Have greater focus on skills like reading, writing, speaking and problem-solving	68
Enhance students' participation in learning	67
Increase interactions between students and academic staff	66
Encourage students to study specific areas of interest in greater depth	64
Develop more supportive learning environments	64
Train staff to better understand learners' needs	64
Challenge students to achieve high academic standards	61
Enhance the convenience of study	59
Offer more enriching experiences and activities outside of class	58
Have fewer lectures and more seminars, workshops and symposia	55
Increase interactions between students	54
Encourage students to study across a wider range of areas	54
Increase interactions between students and support staff	52

These twenty areas were grouped into four broad scales. These scales focus on improving learning contexts, the focus of education, staff and teaching, and students' engagement in learning. Details on these scales is provided in Appendix B.

When stratified by average overall grade gained during their degree, there is a clear pattern of difference on the learning contexts scale. The lower the grades achieved by graduates, the higher their perceived importance of improvement in learning contexts. Another notable difference in the scale scores for these items was evident among non-English speaking background graduates on the focus of education scale. While graduates from English speaking backgrounds ranked this area as relatively important for improvement (with a score of 70 out of 100), those from non-English speaking backgrounds placed an even higher importance on the improvement of these issues, scoring 77 on this scale.

There were also differences on all four of these scales noticeable when graduates responses were divided by field of education. Table 5 shows that education graduates had the highest scores for all of these scales. In general, engineering students had the lowest scores. The greatest variation in responses among the fields of education was in learning contexts, with engineering graduates perceived importance of these areas much lower (57) than education graduates (71).

Table 5 Enhancement areas by field of education

	Learning contexts	Focus of education	Staff and Teaching	Student engagement
Natural and physical sciences	58	68	66	59
Information technology	61	71	65	60
Engineering and related technologies	57	69	64	55
Architecture and building	66	73	68	56
Agriculture and environmental studies	61	70	66	56
Health	66	71	69	62
Education	71	74	72	65
Management and commerce	63	74	66	60
Society and culture	62	68	66	61
Creative arts	66	72	70	59

Key finding 5: In identifying which aspects of bachelor degree education should be improved in order to enhance graduates' employability and skills, respondents placed particular emphasis on enhancing the application and relevance of learning. Enhancing student support was also considered important. The lowest emphasis was placed on factors associated with the practicalities and convenience of study.

Further learning activity and outcomes

Participation in further study is an important outcome of bachelor degree education. Increasingly, undergraduate education is seen to provide foundations for more advanced forms of learning rather than a terminal qualification. In addition to postgraduate qualifications, lifelong learning also requires people to participate in more vocationally focused forms of training and education. The 2008 GPS provided important insights on graduates' involvement in further learning and their highest level of qualification. As noted in Appendix B, the GPS sample showed slightly higher than expected rates of educational attainment among respondents when compared with ABS Census figures from 2006. It is likely that those currently engaged in, or with higher educational qualifications were more likely to respond to the survey than others. Therefore, care should be taken in interpreting the figures below in relation to further study and highest qualification.

Participation in further study

Altogether, 38 per cent of graduates were participating in further learning in 2008, five years after completing their 2002 bachelor degree. Nationally, 12 per cent reported involvement in short training courses, 5 per cent in vocational certificates or diplomas, 3 per cent in further undergraduate study, and 21 per cent in a postgraduate qualification. The participation rates in particular kinds of further study sum to more than 38 per cent due to a handful of graduates taking part in more than one kind. Figure 8 shows the percentage distribution of graduates' participation in kind of program for those who reported taking part in further study.

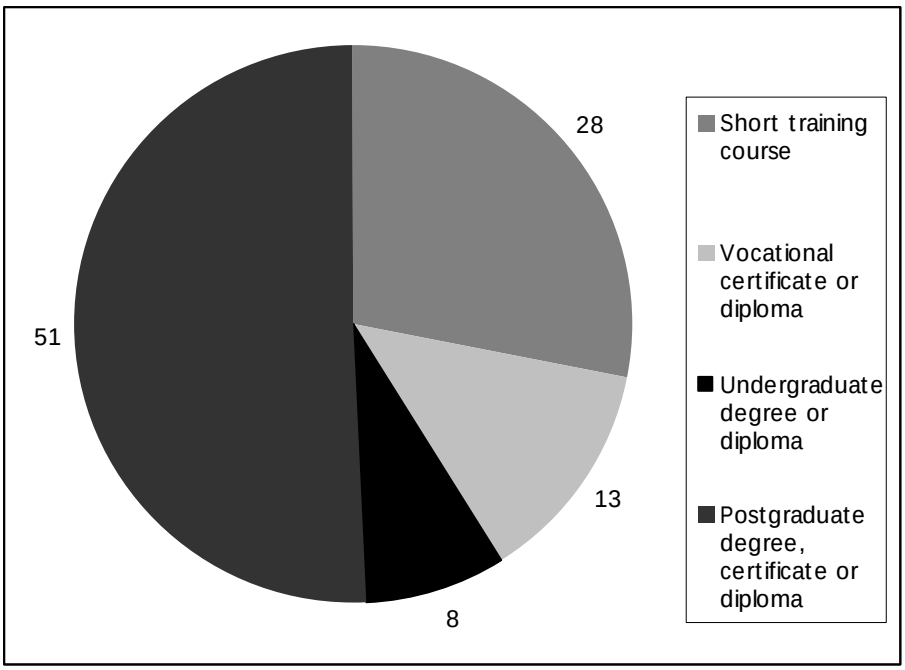

Figure 8 Graduate further study activity (year five)

Graduates remain busy enhancing their knowledge and skills in the first few years after graduation. Participation in further learning remains relatively high and constant across the five year period under study. The number of graduates involved in further learning – including both vocational and higher education – remained relatively stable across the five-year period, from 41 to 38 per cent of the overall population.

Rates of participation in further study at the five year mark varied across institutional groupings. Table 6 shows Go8 graduates were more likely to be involved in postgraduate study (25%) compared with vocational certificates (5%) or short courses (11%). Graduates from regional universities were less likely to be in postgraduate study than Go8 graduates (19% compared with 25%) while graduates from regional institutions more likely to be involved in vocational education (21%), but more likely to be involved in vocational qualifications or short courses. Overall, the rates of bachelor degree graduate participation in formal forms of vocational education and training are relatively low.

Table 6 Further study participation by institution type (year five)

	Short training course	Vocational certificate or diploma	Undergraduate degree or diploma	Postgraduate degree, certificate or diploma
Go8	11	5	3	25
ATN	12	5	4	16
IRU	9	4	4	22
Regional	15	6	3	19
Metropolitan	12	6	3	19

Among the fields of education, Table 7 shows that graduates from science- or humanities-related fields were more likely to be participating in postgraduate study in 2008, while health, and agriculture, environmental studies graduates were more likely to be participating in some form of vocational education. The results also reveal interesting patterns according to average overall grade. For this analysis, 'low' refers to grades below 60 whereas 'higher' refers to grades of 60 or above. Education graduates, for instance, are more likely to be taking part in vocational education if they reported a low average overall grade, and more likely to be undertaking postgraduate studies if they

achieved higher grades. Interestingly, management and commerce graduates are slightly less likely to be undertaking postgraduate studies if they achieved higher grades in their bachelor degree.

Table 7 Further study participation by field of education and average grade (year five)

	Average overall grade	Short training course	Vocational certificate or diploma	Undergraduate degree or diploma	Postgraduate degree, certificate or diploma
Natural and physical sciences	Low	15			30
	Higher	9	4	3	29
Information technology	Low	11		4	12
	Higher	15	4	4	14
Engineering and related technologies	Low	10	6		6
	Higher	18	2	4	19
Architecture and building	Low			16	6
	Higher	12	4	3	8
Agriculture and environmental studies	Low	26	6		32
	Higher	14	6	2	23
Health	Low	8	8	4	15
	Higher	13	8	4	23
Education	Low	13	18		14
	Higher	10	5	3	12
Management and commerce	Low	10	6	10	26
	Higher	13	6	3	18
Society and culture	Low	6	9	6	26
	Higher	9	5	3	27
Creative arts	Low	6	6	19	8
	Higher	8	6	4	18
Total	Low	10	7	5	21
	Higher	11	5	3	21

Further study participation trends were closely linked with field of education. Figure 9 shows that while 60 per cent of science graduates were studying the first year after completing a bachelor degree, this reduced to 41 per cent five years out. Similar declines in further-study participation were observed for the society and culture, management and commerce, information technology and creative arts. By contrast, participation rose in the fields of education, engineering, health, agriculture and architecture. For instance, while 21 per cent of education graduates indicated participation in further learning in the first year after graduation, this figure rose to 28 per cent after five years.

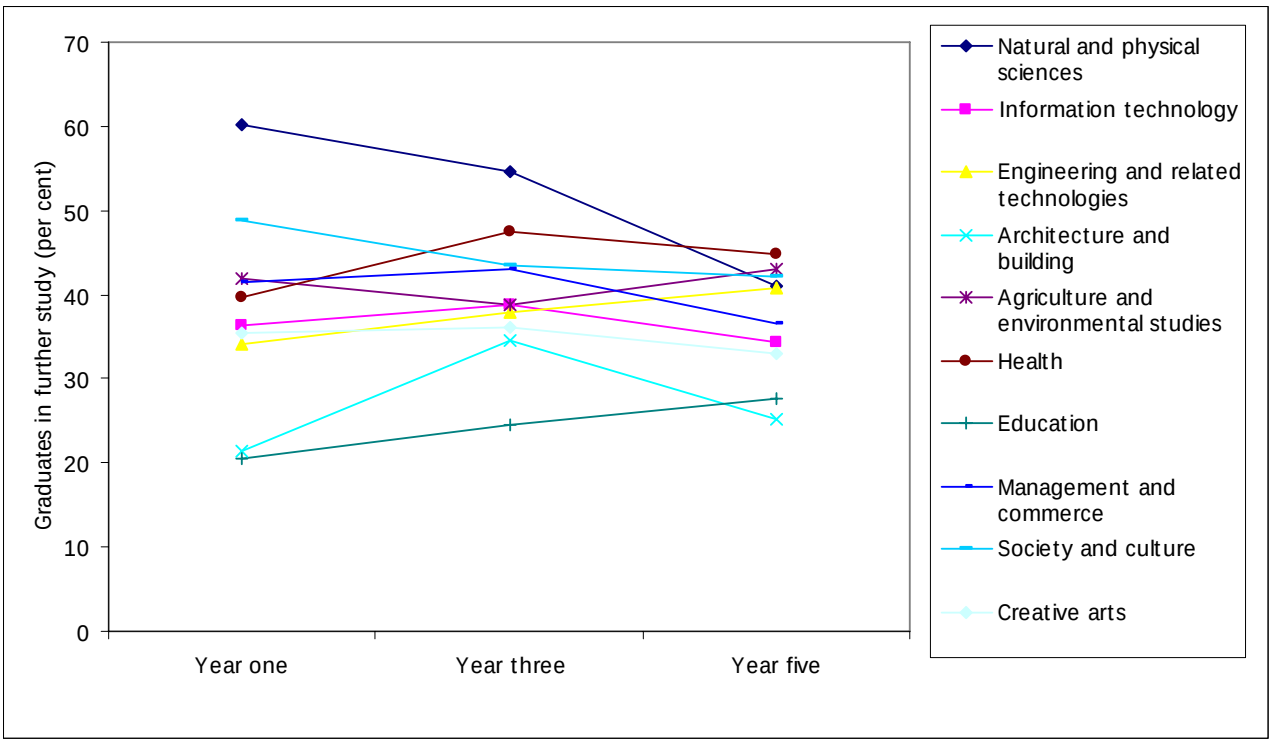

Figure 9 Participation in further learning by field of education

Graduates who completed their 2002 degree in their preferred field were less likely than others to be participating in further study in 2008, particularly in relation to further undergraduate or postgraduate study. This result combines with others to underpin the importance for quality outcomes of a learner's intrinsic engagement in their bachelor-degree study.

Figure 10 reports participation in further study for 2003, 2005 and 2008 according to graduates' overall average grade. It shows that graduates with higher grades tend to participate in further study in the first three years after graduation, with rates falling off in the fifth year – generally because they have completed a postgraduate qualification by this stage. By contrast, participation grows for graduates with grades between 50 and 79. For graduates with grades ranging between 60 and 69, the increased level of participation persists until the fifth year. These insights suggest that academic achievement does play a role in shaping people's participation in further learning.

At the fifth year after graduation, there was very little difference in the types of education enrolled in when examined by average grade during the bachelor degree. The only notable difference was in vocational and further education courses. Between six and seven per cent of those with average grades below 80 during their bachelor degree were enrolled in a vocational education course compared with 4 per cent of those with average grades of 80 or higher.

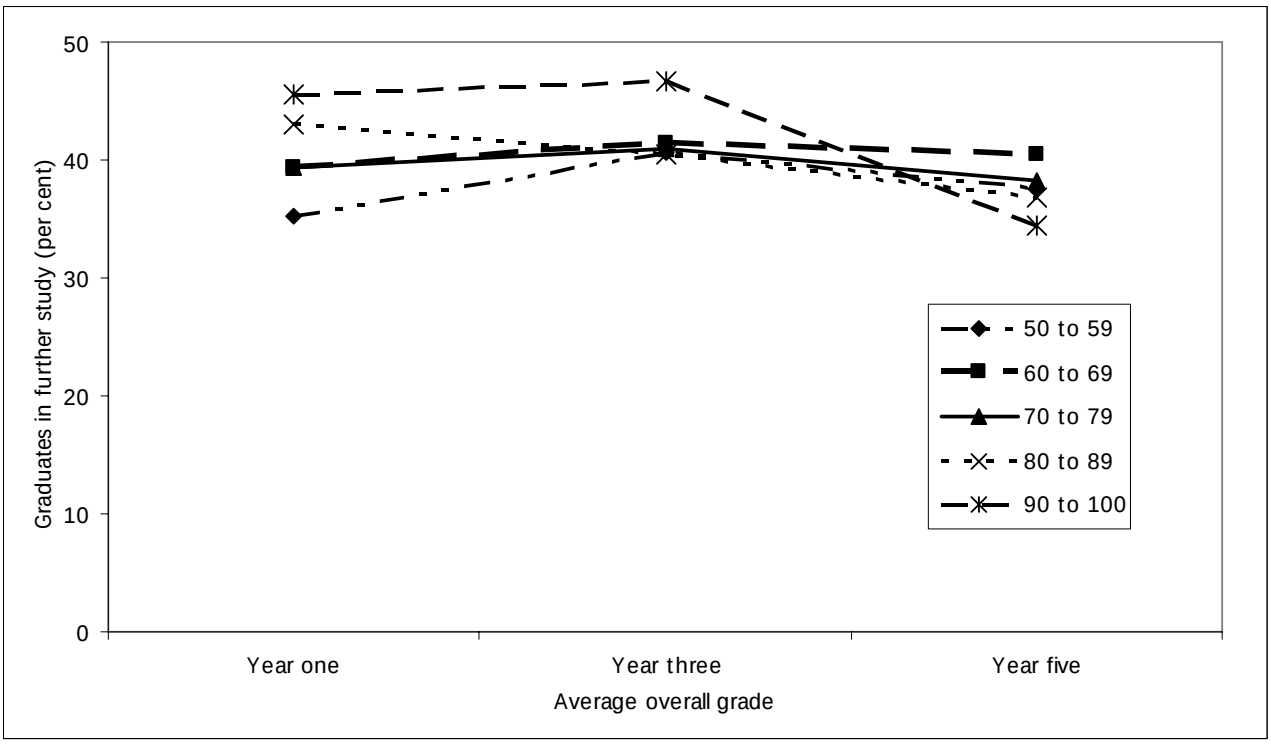

Figure 10 Participation in further learning by average overall grade

Key equity groups displayed interesting further learning participation trends. While disabled graduates were more likely to participate in further study in the year after graduation, after five years the rate equalised that of graduate not reporting a disability. Graduates with lower socio-economic backgrounds were slightly less likely to participate in further learning in the year after graduation, although the figures were on par five years down the track.

Key finding 6: Altogether, 38 per cent of graduates were participating in further learning in 2008, five years after completing their 2002 bachelor degree. Nationally, 12 per cent reported involvement in short training courses, 5 per cent in vocational certificates or diplomas, 3 per cent in further undergraduate study, and 21 per cent in a postgraduate qualification. While participation patterns and rates varied noticeably across institution groups and fields of education, graduates remain generally busy enhancing their knowledge and skills in the first few years after graduation.

Highest qualification

The Graduate Pathways Questionnaire asked graduates to list their highest qualification five years after completing their degree. Nationally, 25 per cent of respondents had completed a postgraduate coursework qualification and 6 per cent a postgraduate research qualification in the five years following completion of their bachelor degree.

These figures appear to put Australian graduates in a good position internationally when it comes to upgrading their qualifications. Research by Bradburn et al. (2006) into the pathways taken by bachelor graduates in the USA 10 years after university completion found that 40 per cent had enrolled in a postgraduate qualification during this time. The fact that 31 per cent of Australian GPS respondents had already completed such a qualification in the five years since graduation indicates a high level of up-skilling among these graduates.

Certain groups of students had much higher proportions of further study completion than others. Natural and physical science graduates had a very high completion rate for postgraduate research degrees in the five years following completion of their bachelor degree – possibly related to entry-

level employment opportunities for these graduates. Among this group, 23 per cent had completed such a degree. Graduates who had high overall grades in their bachelor degree were also more likely to have completed a research postgraduate qualification (19%) than the national average. Graduates from Go8 universities also had a high rate of postgraduate research degree completions in the five years following bachelor degree completion (10%).

A slightly different pattern existed for postgraduate coursework completion among GPQ respondents. Thirty-five per cent of non-English speaking background and Indigenous graduates had a postgraduate coursework qualification five years after completion of their bachelor degree. Graduates from the society and culture field of education also had high rates of postgraduate coursework degree qualifications (32 per cent).

Graduates from the architecture and building, and education fields were least likely to have a postgraduate qualification five years after their bachelor degree. Among the architecture and building graduates, 12 per cent had a coursework postgraduate degree and 1 per cent a research degree. Education graduates also had only 1 per cent with a postgraduate research degree, while 17 per cent had a postgraduate coursework qualification.

Key finding 7: Five years after completing their degree, 25 per cent of all respondents had completed a postgraduate coursework qualification and 6 per cent a postgraduate research qualification. The rate of research degree completion was higher for graduates from the natural and physical sciences (23%), graduates with high overall grades (19%), and graduates from Go8 universities (10%). Graduates from the architecture and building, and education fields were least likely to have a postgraduate qualification five years after their bachelor degree.

Deborah went back to university in 1997 after a few decades in the workforce, completing a commerce degree in 2002 at the age of 45 out of interest and to improve her work prospects. She studied part time and worked at a government agency for around 50 hours per week. Her marks ranged between 70 and 79, and she saw her degree as helping develop key skills. It did not, however, enhance her understanding of people from other racial and ethnic backgrounds. She was also disappointed in the information systems area she had chosen for her major.

Deborah continued in her current position for a few years after completing her degree, shifting in 2004 to a more senior post which made better use of her university-acquired skills. This role involved more hours – up from 40 to 45. But the salary increased from $47,000 to $52,000. She also undertook a postgraduate diploma. In 2008 she made another move, based mostly on her workplace experience, which further increased her salary to $83,000.

Jasmine was in her mid-fifties and the first person in her family to attend university when she completed a bachelor of fine arts in 2002. She was previously employed in a job that she was only moderately satisfied with, and did not see as a long term prospect. Having completed her degree she is now very satisfied with her graduate work as an activities officer and sees herself continuing this kind of work for at least the next few years.

Although given the chance to start over again she would choose to do the same bachelor degree, Jasmine rated her overall educational experience as only ‘fair’ and would probably not have studied at the same university. She felt that her experience during her bachelor degree helped very little with acquiring job- or work-related knowledge and skills and feels that there needs to be more of a focus on developing capabilities needed for professional success, careers advice should be enhanced, and teaching staff should have current workplace experience and knowledge.

5 EMPLOYMENT OUTCOMES AND PATHWAYS

> The specific units of mathematical detail that are only relevant to students who are entering into R&D type positions [were the least relevant aspects of the degree]. These cater for a minimal percentage of graduates… (28 year old male electrical and electronic engineering graduate)

> The Bachelor of Communication had a very strong focus on group work. The skills gained from this have been a huge strength for me in my paid work and put me ahead of other employees in terms of my mature approach to work. (28 year old female media studies graduate)

> [The most beneficial aspects of the degree were] writing business documents and the soft skills such as time management and prioritising of tasks. (27 year old male sales and marketing graduate)

Introduction

This chapter reports on graduate employment outcomes or 'destinations' following graduation. It begins by considering graduates' participation in paid work and work-seeking activity, then turns to consider in more depth the characteristics of graduates' work.

While the primary purpose of the GPS is to review graduates' destinations five years beyond completion, the GPQ was designed to examine the development of graduate careers one, three as well as five years beyond graduation. Even given the inherent problems associated with graduates' recollection and recall – which a longitudinal study would reduce – it is informative to chart development in these formative years post-completion. False impressions may be formed if focus is placed only on activities five-years-out, rather than on how graduates reached that point.

Hence this chapter reviews graduate outcomes one, three and five years beyond completion. The analysis is deliberately selective rather than exhaustive. It focuses on key outcomes and on a number of the most important demographic and educational characteristics. As the analysis shows, there are significant fluctuations across this five-year period, fluctuations which reinforce the considerable added-value of taking a three-to-five year perspective on examining graduate outcomes from university.

Participation in paid work

Figure 11 reports that in 2008 – five years after completing their bachelor degree – 75 per cent of graduates were involved in full-time work, 16 per cent in part-time work, and 9 per cent were not working. After filtering out graduates involved in formal vocational, undergraduate and postgraduate education, these percentages adjusted to 8 per cent not working, 80 per cent in full-time work, and 13 per cent in part-time work.

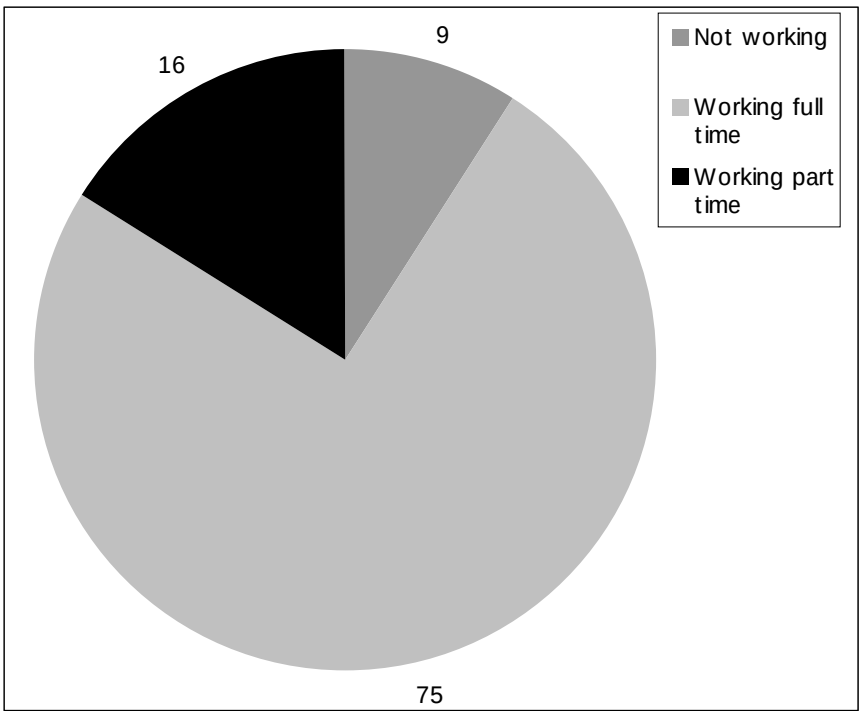

Figure 11 Graduate work activity (year five)

In the five years after completion, bachelor degree graduates' employment rates consistently improved. Nationally, the rate of participation in paid work rose from 84 to 91 per cent between the first and fifth year following graduation.

Rates of participation in paid work were relatively constant across institutional groups five years after graduation (Figure 12). However, within these groups there were different patterns apparent over the five years after graduation. The rates of participation in work were notably lower for graduates from Go8 and IRU institutions in the first year after completion. For Go8 graduates, this may be due to higher rates of enrolment in further study – 47 per cent in the first year. In the first year, the overall rate of participation in further study for IRU graduates was on par with the national average (40 compared with 41).

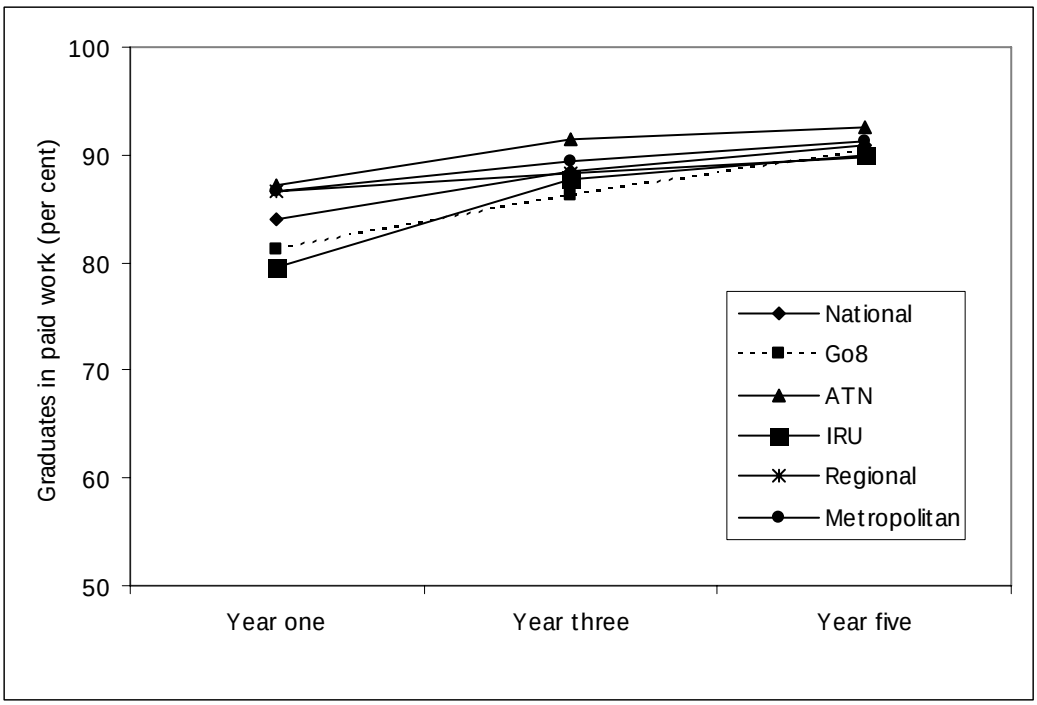

Figure 12 Participation in paid work by institution group

Within the fields of education, Figure 13 shows that science graduates were least likely to be participating in paid work in the first year after graduation and five years out, although the rate grew from 67 to 85 per cent over this period. Notable growth in participation was also seen with IT, engineering, agriculture, society and culture and creative arts graduates. Among graduates in the education field, the situation was the opposite, with participation rates decreasing in the years following graduation. The rates remained relatively steady for architecture and health graduates, and increased slightly for business and commerce graduates. More detailed analysis of outcomes for science and engineering graduates is provided in the final chapter.

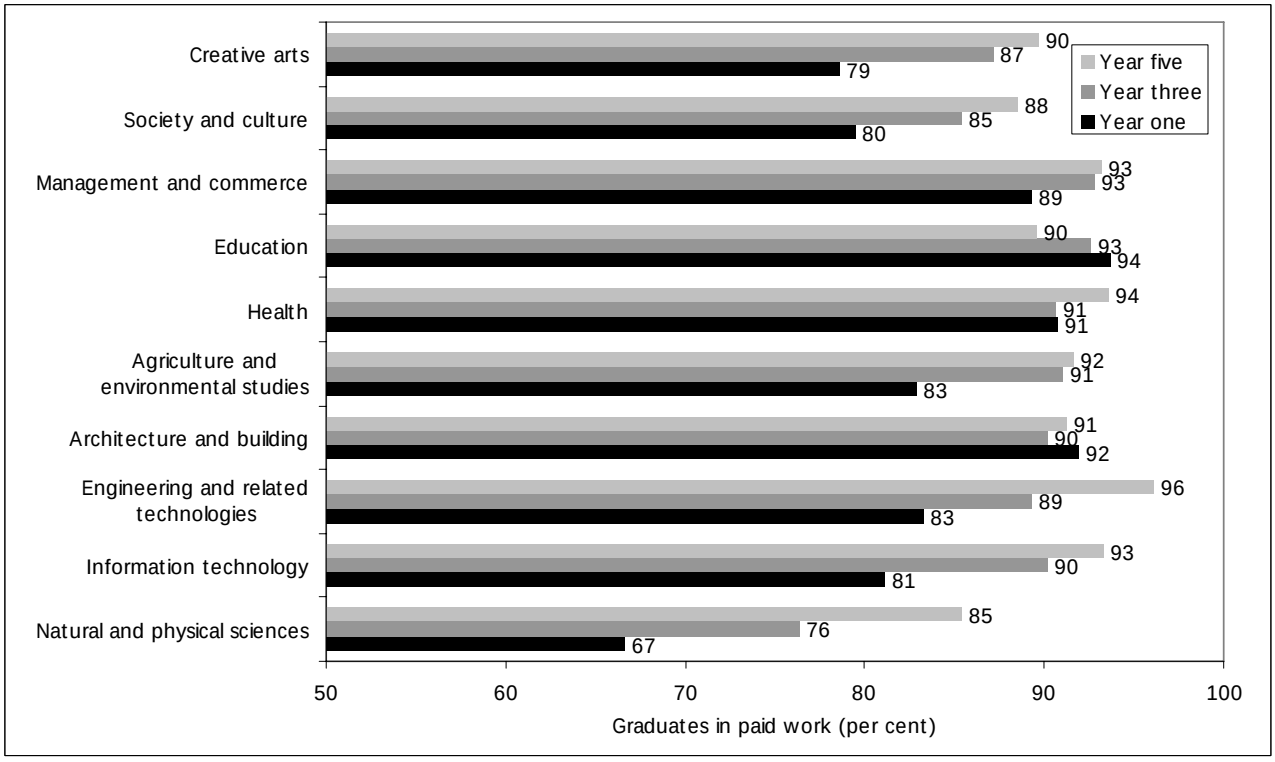

Figure 13 Participation in paid work by field of education

Table 8 shows the participation in paid work in the first, third and fifth years after graduation for graduates from various demographic groups. For each group and year, it shows the percentage of graduates not working (NW), in full-time work (FT), and in part-time work (PT). Summary comments follow the results. Chapter six presents more detailed analyses of the outcomes of graduates in these groups.

Table 8 Participation in paid work for various demographic groups (per cent)

		Year one			Year three			Year five		
		NW	FT	PT	NW	FT	PT	NW	FT	PT
Total		16	60	24	12	69	19	9	75	16
ATSI status	Not ATSI	16	60	24	12	69	19	9	75	16
	ATSI	16	58	25	9	73	18	3	78	19
Disability	No	15	60	24	11	70	19	8	76	16
	Yes	31	46	23	22	57	20	19	57	23
Primary school locality	Metropolitan	15	60	25	11	70	19	9	76	16
	Provincial	15	62	23	10	72	18	9	73	17
	Remote	22	53	25	6	69	25	8	69	23
Primary school SES	Lowest 25%	17	60	23	11	70	19	9	75	17
	Middle 50%	15	61	24	10	72	18	8	76	16
	Top 25%	15	60	25	12	69	18	9	75	15
Father occupation level	Non prof.	14	61	24	10	71	19	9	75	16
	Professional	17	59	25	12	69	19	9	74	16
Mother occupation level	Non prof.	16	60	24	11	69	20	9	74	17
	Professional	16	58	26	12	71	17	9	75	15
First in family	Not first in family	17	58	25	12	69	19	10	75	15
	First in family	15	61	24	11	70	19	9	74	17

While the numbers are very small and the project did not seek to oversample to capture more evidence, the figures show that while Indigenous graduates are just as likely as others to not be working in the first year, their situation improves in the third and fifth years. In year five, for instance, while around nine per cent of non-ATSI graduates were not working, the rate for ATSI graduates was just three per cent.

Graduates with disabilities are less likely to be working in first year after graduation than other graduates (69 compared with 85 per cent), although the difference reduces by year five (81 compared with 92 per cent). The difference appears to be largely associated with rates of participation in full-time work, which remain relatively consistent across the five-year period. The reduction in the fifth year is related to increased participation in part-time work in that year of those with disabilities.

Graduates with backgrounds in remote locations were less likely to be participating in paid work in the first year after graduation, a difference which reduced by the third and fifth years largely due to increased participation in part-time work. Patterns and trends for graduates who completed primary school in metropolitan or provincial areas were relatively similar.

The 2008 GPS measured socio-economic background in several different ways, and three are reported in Table 8 – an area measure based on the location of the graduate's primary school, information about parental occupation, and information about parental education. Differences in employment outcomes according to primary school locality were minimal. Graduates with fathers in professional occupations were very slightly less likely to be participating in paid work in the first year after graduation, although the difference reduced by the fifth year after graduation. Differences according to first-in-family status were minimal.

Participation in paid work during study, also considered in more depth in chapter six, appears to be positively associated with employment following graduation. Of those who reported doing no paid work during their study, 39 per cent remained out of the paid employment in the first year after completion of a Bachelor degree, a figure which dropped to 17 per cent five years out. By contrast, of those who worked during their degree, employment rates were much higher. The more hours worked during university, the higher the rates of employment following graduation.

The results of the GPQ also show that the paid work situation of graduates from a non-English speaking background (NESB) improved notably over the five year period following bachelor degree graduation. As shown in Figure 14, one year out from university, the participation rates of NESB graduates was much lower than their English speaking background peers. However, by five years out from university the participation rates of these two groups were almost identical.

Additionally, those from a non-English speaking background were less likely than others to be in full-time employment the first year after graduation (55 compared with 60 per cent), but slightly more likely after five years (77 against 74 per cent).

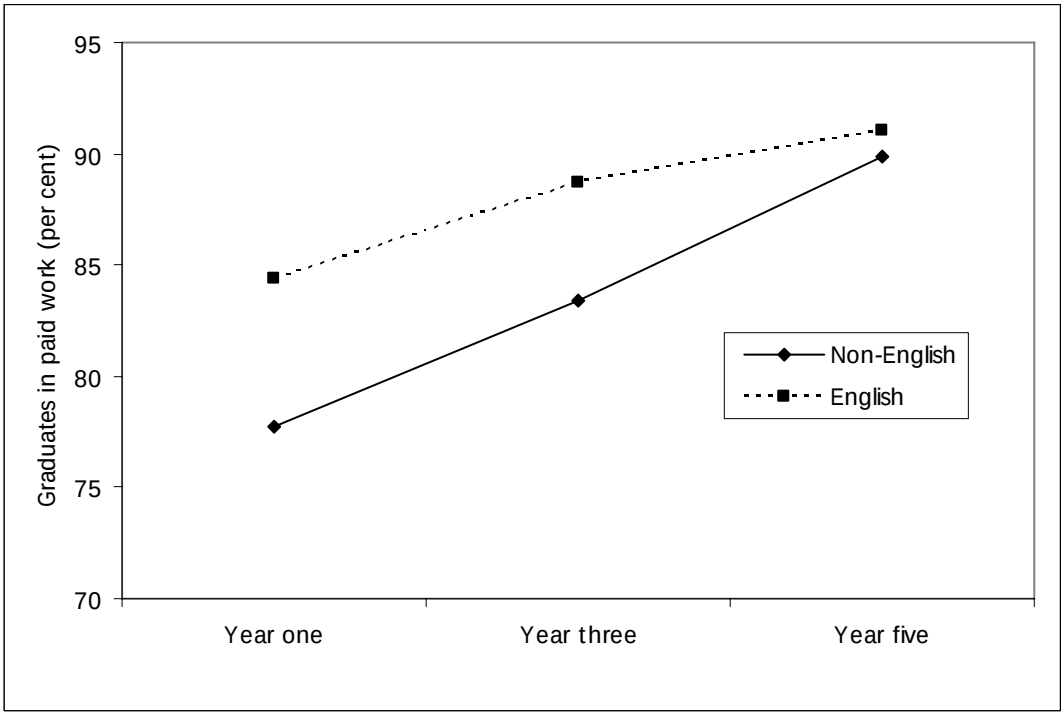

Figure 14 Participation in paid work by language background

Graduates who are participating in paid work may be involved in part- or full-time employment. In the first five years after completion, the national rate of participation in part-time work decreased, while full-time work increased from 60 to 75 per cent.

There was variation in the work activities of graduates according to their academic achievement in their bachelor degree. Figure 15 shows that five years after bachelor degree completion, high achieving graduates are less likely to be employed full time than those with outcomes below 80, a trend which was particularly pronounced for females.

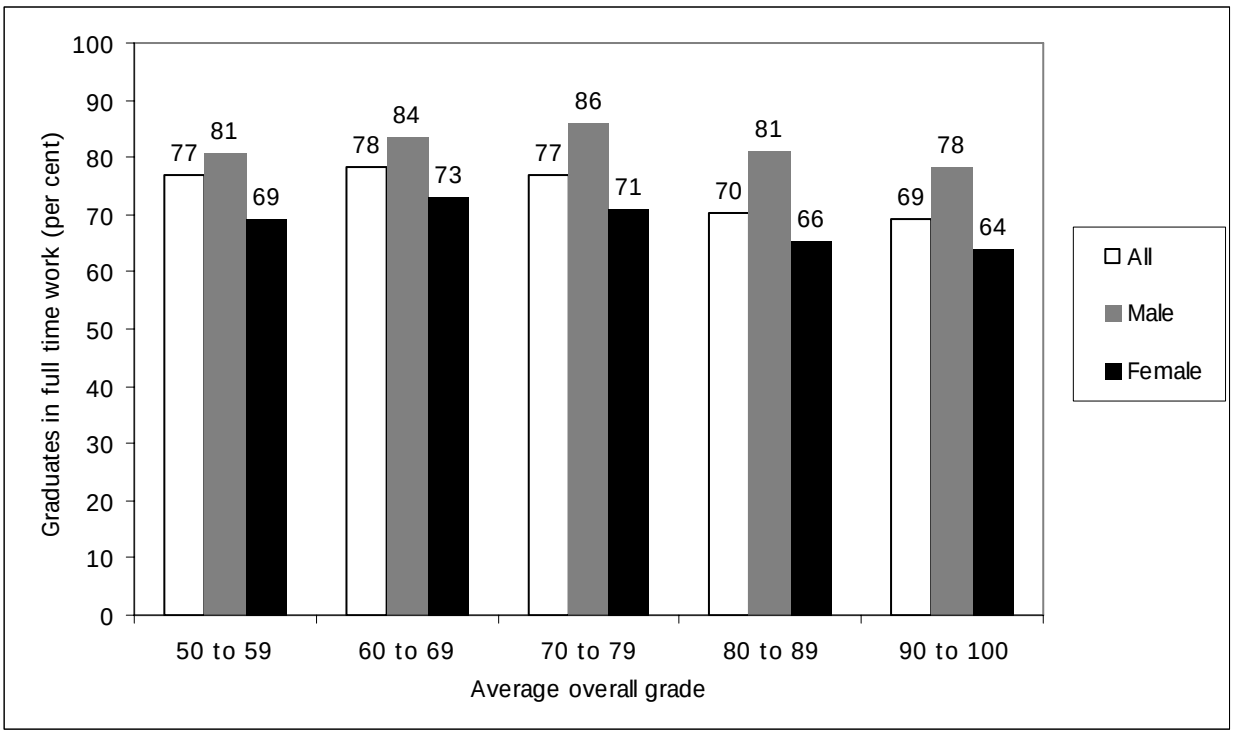

Figure 15 Full-time work activity by sex and average overall grade (year five)

A contrary trend is apparent in relation to part-time work. Figure 15 shows an almost linear relationship between grades and participation in part-time work for females, with the exception of those with grades in the lowest category. The relationship for males is less apparent. Explaining these trends is difficult and may be the result of a number of factors. One key reason for this however may be the fact that a larger proportion of those graduates with average grades above 80 were women, and as shown in the following chapter, women were less likely to be in full-time work and more likely to be in part-time work compared with men by their fifth year after graduation.

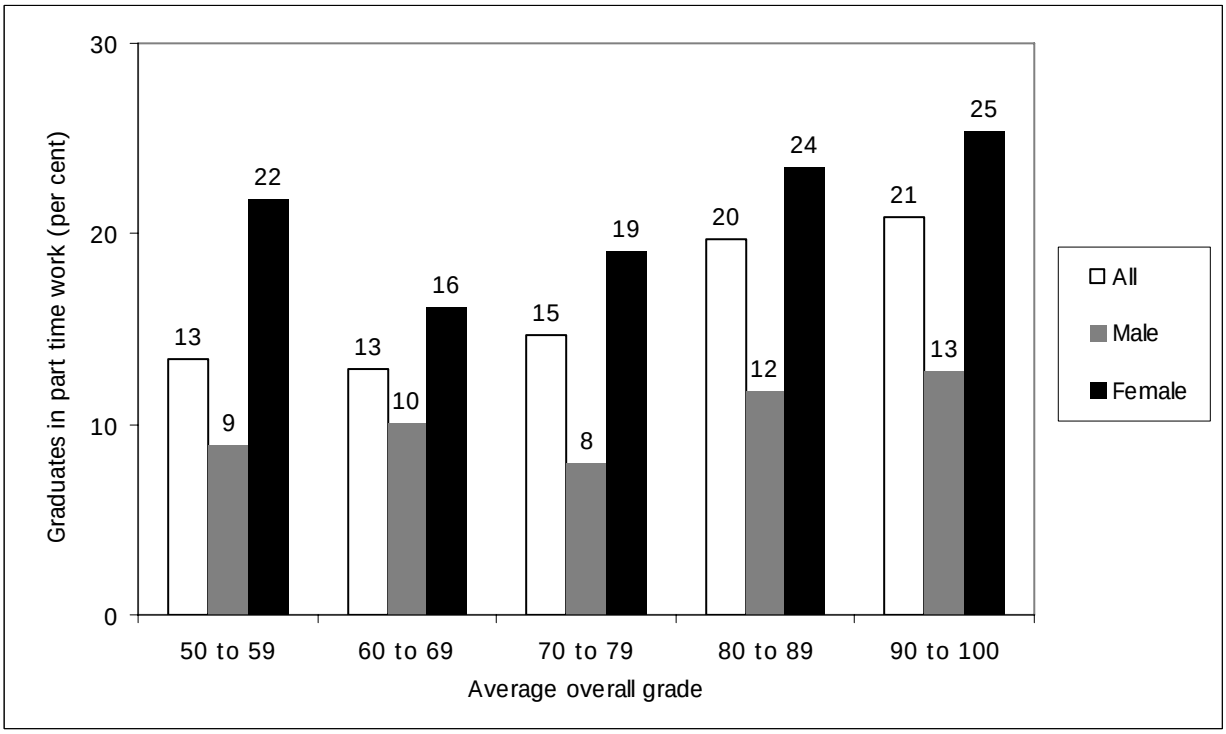

Figure 16 Part-time work activity by average overall grade (year five)

When paid work status is examined by field of education, there are also notable differences in outcomes. As Table 9 shows, graduates in the following fields reported the highest incidence of full-time work: engineering, information technology, management and commerce, and architecture and building. By contrast, graduates from the creative arts, society and culture, and health fields reported the lowest rates of full-time employment among the fields of education. Low rates of full-time employment were also found amongst older graduates and graduates with disabilities.

Table 9 Work activity by field of education (year five)

	Working full time	Working part time
Natural and physical sciences	71	14
Information technology	85	8
Engineering and related technologies	90	6
Architecture and building	83	8
Agriculture and environmental studies	77	15
Health	69	25
Education	71	18
Management and commerce	86	7
Society and culture	68	20
Creative arts	65	25

Five years after bachelor degree completion, graduates with disabilities were less likely to be in full-time employment than others (76 compared with 57 per cent), as were those from remote backgrounds (69 per cent compared with 76 per cent for metropolitan).

Key finding 8: The rate of participation in paid work rose from 84 to 91 per cent between the first and fifth year following graduation. Rates of full-time work increased (60 to 75 per cent) whereas those of part-time work decreased (24 to 16 per cent). Science graduates were least likely to be participating in paid work across the period under study whereas engineering and education graduates had consistently high levels of employment. Graduates who worked for pay during their study were more likely to be employed. Higher levels of academic performance were associated with lower levels of (full-time but not part-time) labour force participation. People with non-English speaking backgrounds were less likely to be participating in paid work in the first year after graduation, but by the fifth year, there was no difference between these and other graduates.

Work seeking activity

Five-years out, regardless of their current work situation, around 15 per cent of graduates were seeking full-time work and around half that number, 7 per cent, were seeking part-time work. The rate of full-time work seeking dropped to 13 per cent for those not working. The rate of part-time work seeking rose to 13 per cent for those not working, and declined to two per cent for those in full-time work.

The GPQ responses show that graduates' work-seeking behaviour fluctuates over a five-year period. Seeking work is related to but independent from employment participation. It provides an index of employment mobility, and possibly even satisfaction with a job, industry or field. Of course, rates of work seeking will be influenced by a range of individual, industry and general economic factors, a full analysis of which lies beyond the scope of this study.

The part-time work seeking rate for creative arts graduates, for instance, varies from 16 to 12 per cent over five years, compared with 4 to 3 per cent for engineering graduates. While the sample numbers are low, Indigenous graduates appear increasingly more likely to seek part-time work – the

rate rising from 2 to 5 to 13 per cent at the one-, three- and five-year intervals. There are similar trends for graduates who report having a disability.

Nationally, the rate of graduates seeking full-time work declines from 20 per cent in the first year out to 16 per cent after three years and 15 per cent after five. These figures are broadly consistent across university groups. Figure 17 shows that there is quite substantial variation, however, in terms of field of education. Among the fields of education, graduates from the information technology were most likely to be seeking full-time work (21%) at the five-year mark. Reviewing trends over five years exposes different career trajectories across the fields of education. Science and health graduates are slightly more likely to be searching for full-time employment after five years compared with their situation in the first year after graduation. The rate of graduates seeking full-time work for education, creative arts and agriculture graduates drops by between eight and 14 percentage points over the five year period.

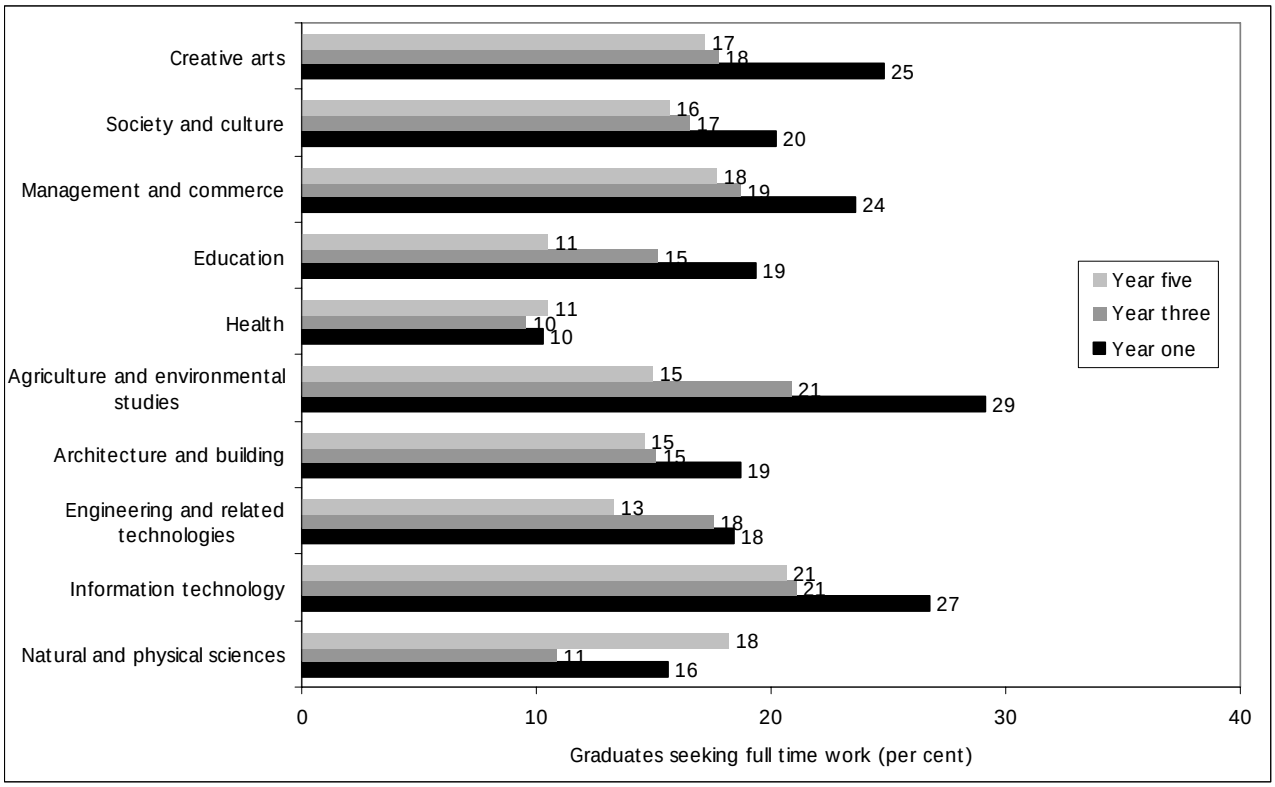

Figure 17 Full-time work seeking activity by field of education

Males (18%) were more likely to be seeking full-time work than females (13%) five years after graduation. Those graduates who achieved lower marks in their degree were also more likely to be looking for full-time work (23%) than others at this stage. Similarly, 26 per cent of graduates who were not Australian citizens were searching for full-time work by the fifth year, compared with 15 per cent among those who were Australian citizens. The responses also revealed that graduates were more likely to be looking for part-time work if they were an Indigenous graduate, aged between 50 and 70, a graduate with a disability or a graduate from the creative arts field of education.

Key finding 9: Five-years out, regardless of their current work situation, around 15 per cent of graduates were seeking full-time work and around half that number, 7 per cent, were seeking part-time work. The rate of full-time work seeking dropped to 13 per cent for those not working. The rate of part-time work seeking rose to 13 per cent for those not working, and declined to two per cent for those in full-time work. There are notable differences in work seeking rates when examined by field of education.

Work characteristics

This section provides more detailed analysis of the characteristics of the work undertaken by those graduates who reported participating in employment. The following characteristics are explored: contract type and duration, work industry, graduate occupation, country of work, length of employment, annual salary, and work satisfaction.

Contract type and duration

For those graduates who indicated that they were employed, the GPS asked graduates whether they were employed on a temporary or casual contract, on a fixed term contract (under or over 12 months) or on a permanent or open-ended contract.

Of those graduates who were in employment five years following completion of their bachelor degree, nationally, just over three-quarters (76 per cent) reported having a permanent or open-ended contract, 16 per cent reported having a fixed-term contract, and just under a tenth (9 per cent) reported being in temporary or casual employment.

When these results are examined by university grouping, a greater proportion of Go8 and IRU graduates reported fixed-term contracts compared with ATN graduates or those from regional institutions. Table 10 shows that regional and ATN graduates were more likely to have permanent positions.

Table 10 Contract type and duration by university group (year five) (%)

	Temporary or casual	Fixed-term contract up to 12 months	Fixed-term contract more than 12 months	Permanent or open-ended contract
Go8	8	11	8	72
ATN	8	7	6	79
IRU	10	10	8	72
Regional	8	6	6	80
Metropolitan	9	7	7	77

Among the fields of education, graduates with management and commerce, engineering, and architecture qualifications were more likely to have permanent contracts than those who studied in natural and physical science, creative arts or health fields five years after graduation.

Figure 60 shows that the employment contract terms of graduates improve over the five year period following course completion. The proportion of graduates in temporary or casual employment falls during the first five years after graduation – from 25 to 15 to just 9 per cent. Conversely, the rate of permanent employment rises from 58 to 76 per cent during this time.

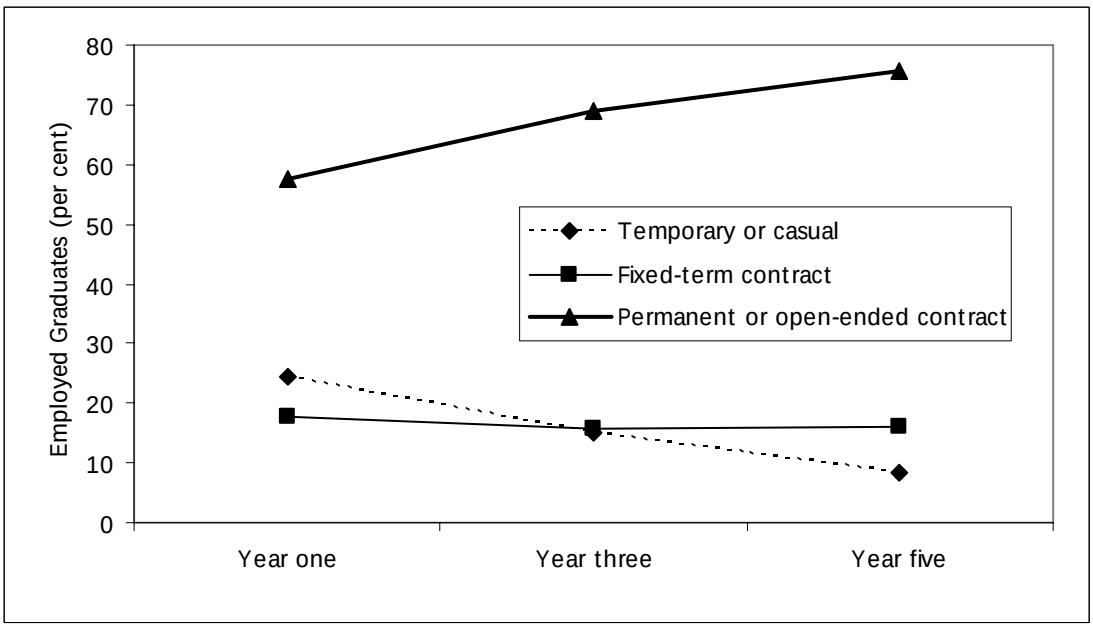

Figure 18 Contract length in first, third and fifth year after graduation

Key finding 10: Of those graduates who were in employment five years following completion of their bachelor degree, nationally, just over three-quarters (76 per cent) reported having a permanent or open-ended contract, 16 per cent reported having a fixed-term contract, and just under a tenth (9 per cent) reported being in temporary or casual employment. In the five years under study, there is an increase in the number of graduates with permanent or open-ended contracts and a decrease in the number of graduates in temporary or casual employment.

Work industry

Table 11 shows the proportion of employed graduates by field of education and industry of employment five years after completion of their bachelor degree. The top three industry destinations for each field are shaded grey. The most notable industry-field of education matches were in the more vocational fields of education, with 80 per cent of Health graduates working in the health and community services industry, 85 per cent of education graduates working in the education industry and among architecture graduates, 54 per cent employed in construction and 16 per cent in the property and business services industries.

In the less vocationally specific fields of education, graduates were slightly more widely spread across industries. By way of example, 34 per cent of science graduates work in the education industry, 24 per cent work in health and community services, and 11 per cent work in government administration and defence. Five years after completion, 28 per cent of humanities (society and culture) graduates worked in the health and community services industry, 22 per cent in education and 19 per cent in government administration and defence. Agriculture graduates who were employed five years following graduation worked mainly in government administration and defence, agriculture, forestry and fishing, and education, but also had prominence in health and community services and property and business services. Information technology graduates were also spread over a number of industries, with property and business services employing more than one quarter (25%). Creative arts graduates most commonly work in education (25%), while 16 per cent work in cultural and recreational services and 13 per cent in the manufacturing industry.

Table 11 Work industry by field of education (year five)

	Field of Education									
	Scien-ces	IT	Engi-neering	Archi-tecture	Agri-culture	Health	Edu-cation	Bus-iness	Hum-anities	Creative Arts
Agriculture, forestry and fishing	3				15	0	0	1	1	0
Mining	6	2	10	1	4	1	0	2	0	0
Manufacturing	7	10	14	2	2	0	1	7	2	13
Electricity, gas and water supply	1	1	7	1	4			1	1	0
Construction	1	2	8	54	4	0	0	2	0	2
Wholesale trade	0	1	2		0	0		1	0	0
Retail trade	2	2	3	1	2	2	1	5	2	4
Accommodation, cafes and restaurants	0	1			0	0	0	2	1	3
Transport and storage	1	3	4	0	1	0	0	3	1	1
Communication services	0	3	1			0		1	0	1
Finance and insurance	2	12	2	0	2	1	1	31	6	3
Property and business services	4	26	27	16	11	1	1	13	13	11
Government administration and defence	11	10	9	14	23	2	1	11	19	7
Education	34	16	7	3	15	9	85	9	22	25
Health and community services	24	7	3		13	80	8	8	28	11
Cultural and recreational services	1	2	0	0	1	2	0	3	2	16
Personal and other services	2	1	3	7	2	2	1	2	1	4

One of the most interesting aspects of the GPS is its capacity to provide insight into how graduates from different fields move between industries. There are many stories to tell in this area, and a series of high-level results are reported in Figure 19 to Figure 28 as a prelude to further analyses. It is important to note that these high-level results may be influenced to some extent by the level of aggregation at which results are reported, and by the nature of the ASCED and ANZSIC classifications themselves. To facilitate further analysis, GPS 2008 data was coded at finer levels of aggregation than the results reported here.

Even at this broad level, the results suggest, for instance, that graduates from certain fields work in a small selection of industries while graduates from other fields are more likely to work across fields. Science, IT, engineering, agriculture, management, humanities and creative arts graduates work across industries. By contrast the work of architecture, health and education graduates is more focused on specific industries.

Each field of education has its own story to tell. As suggested during the consultations, a science degree may be broadly considered to be a generalist degree which provides core competencies that employers can use as a base for training graduates in more specific technical and industry specific skills. The results reported here suggest that science graduates are likely to be employed in the retail trade industry in their first year out but increasingly less so in their third and fifth years. The employment of science graduates in education increases between the first and third years, but then decreases by year five. By contrast, there is a steady increase in the proportion of graduates employed in government and in the health and communities services industry.

Unsurprisingly perhaps, health graduates are most likely to be employed in the health industry. The rate falls from 82 to 80 per cent in the first five years after graduation, however, and there is an increase from 6 to 9 per cent in the rate of participation in the education industry among these graduates.

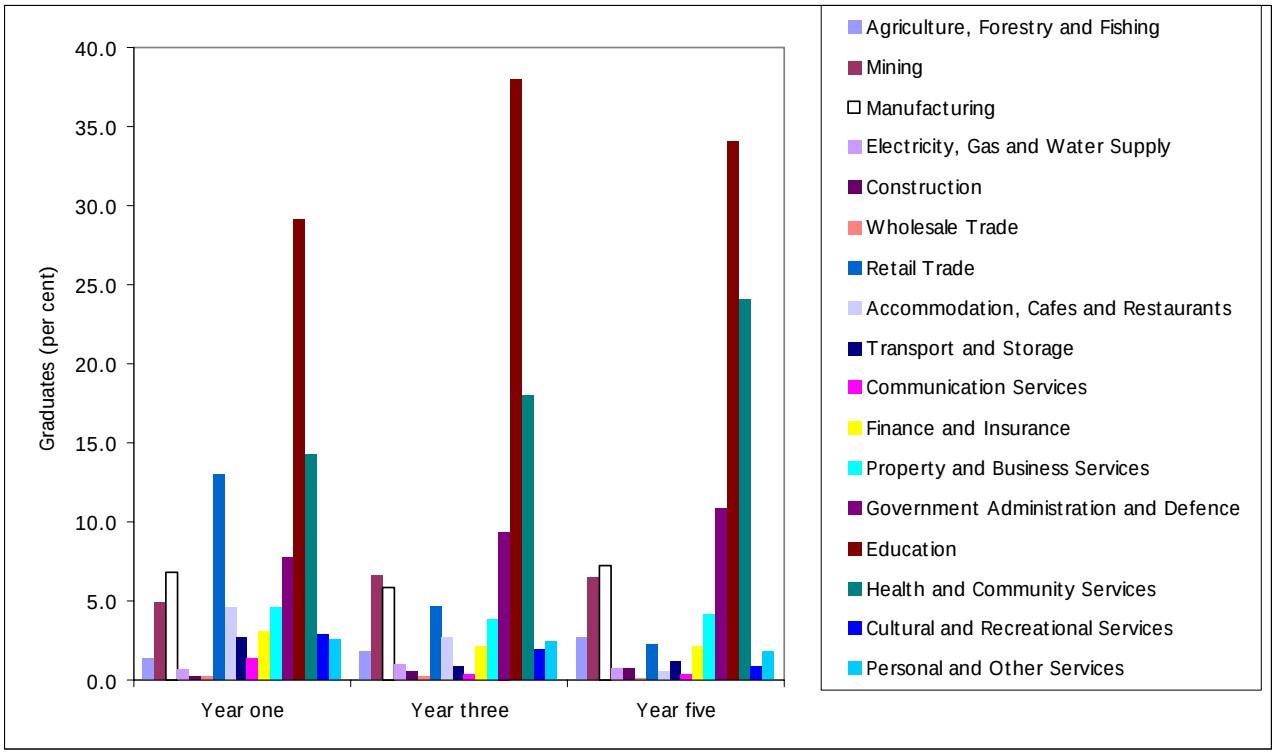

Figure 19 Natural and physical sciences graduates' work by industry

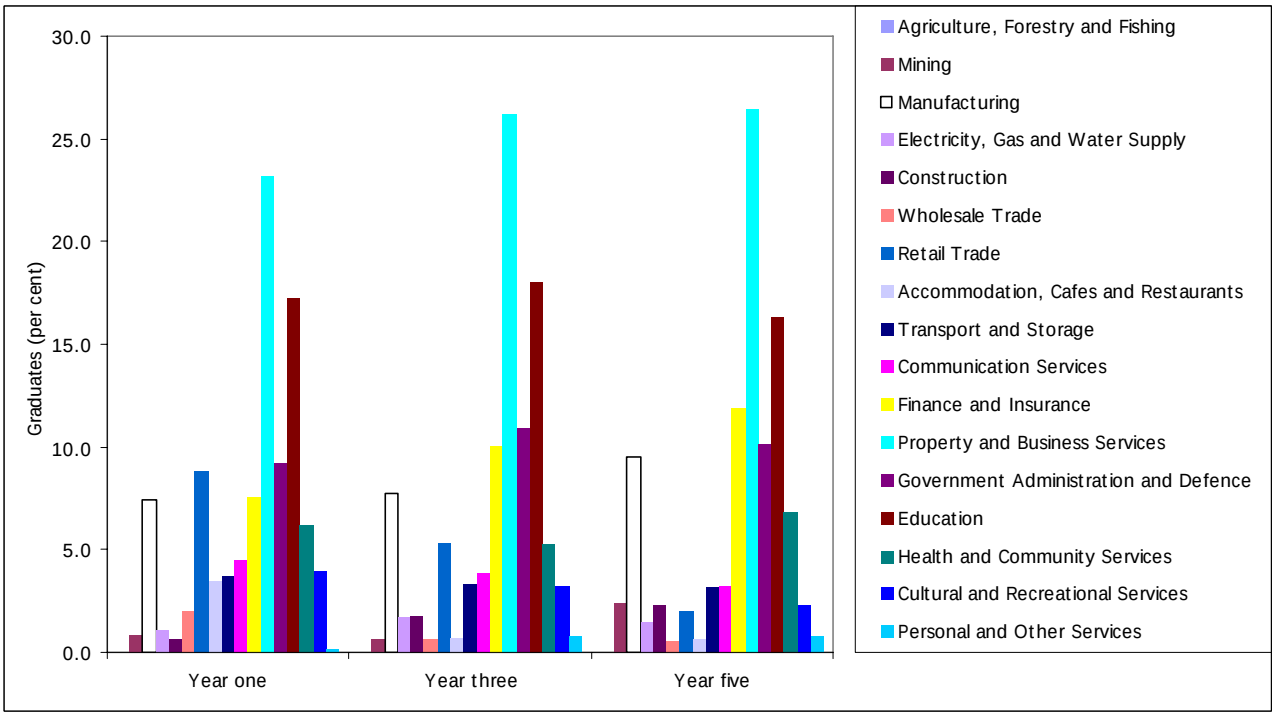

Figure 20 Information technology graduates' work by industry

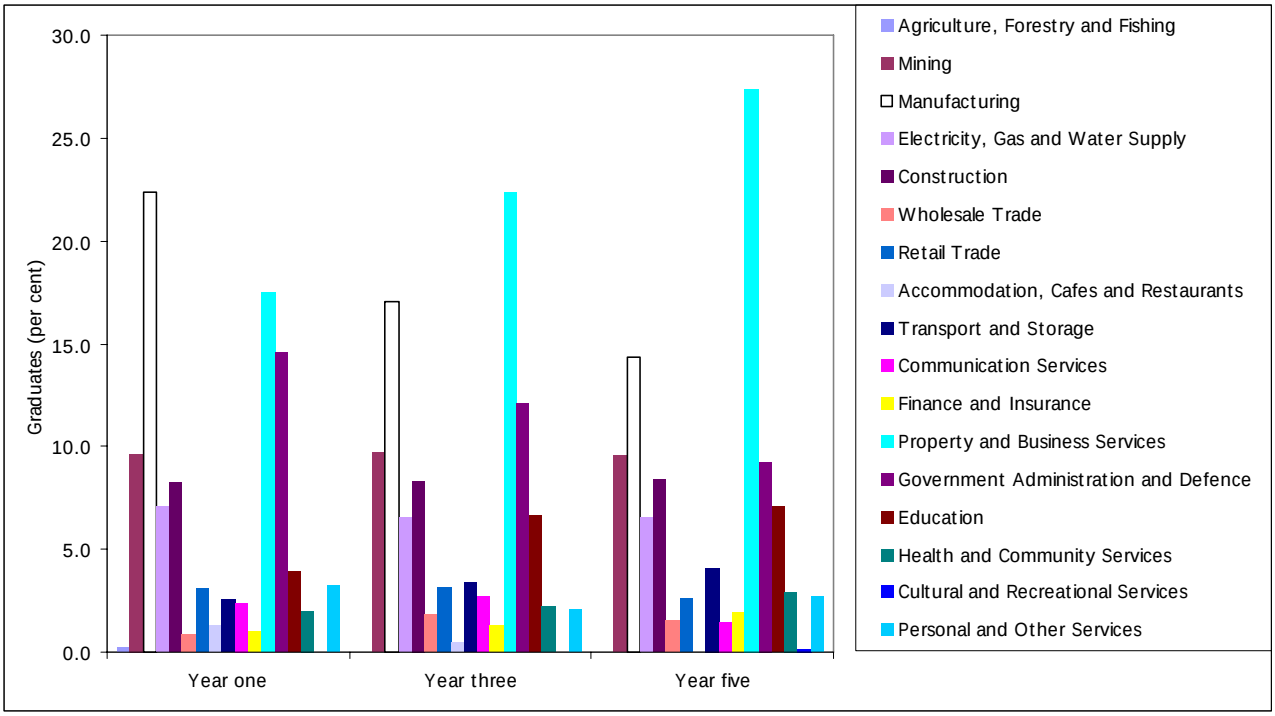

Figure 21 Engineering and related technologies graduates' work by industry

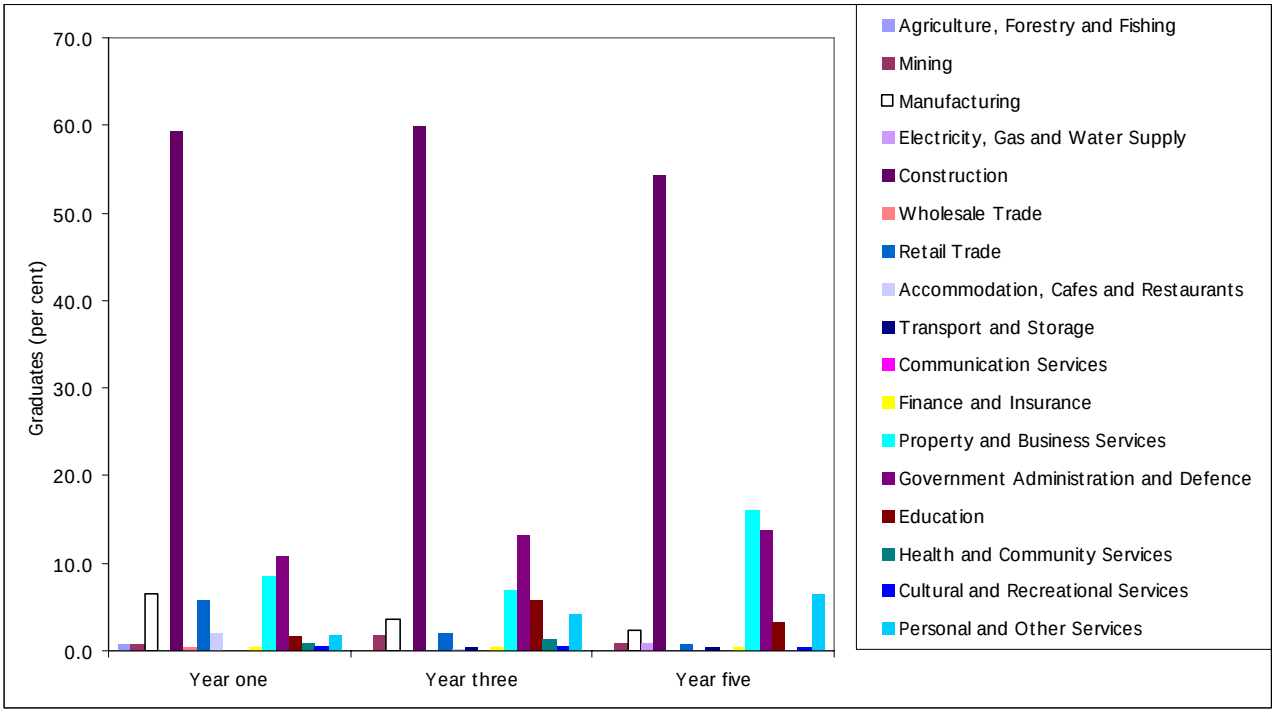

Figure 22 Architecture and building graduates' work by industry

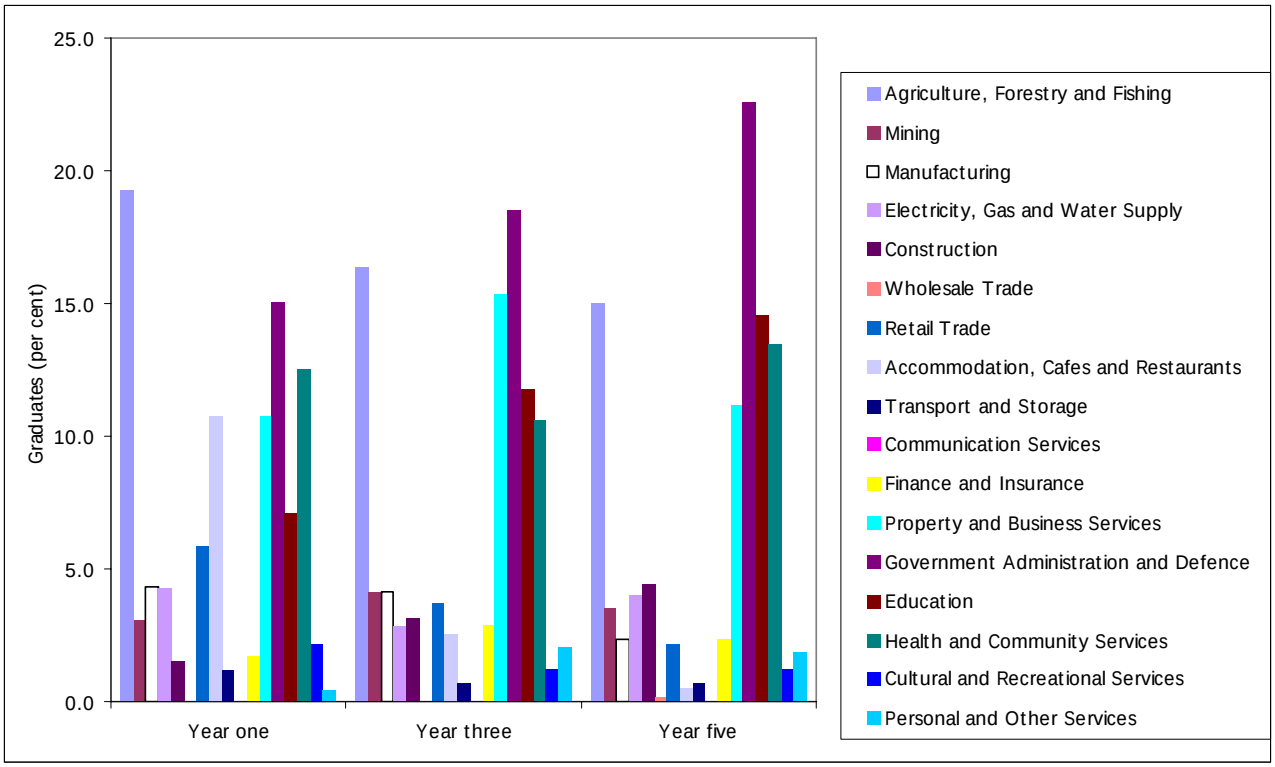

Figure 23 Agriculture and environmental studies graduates' work by industry

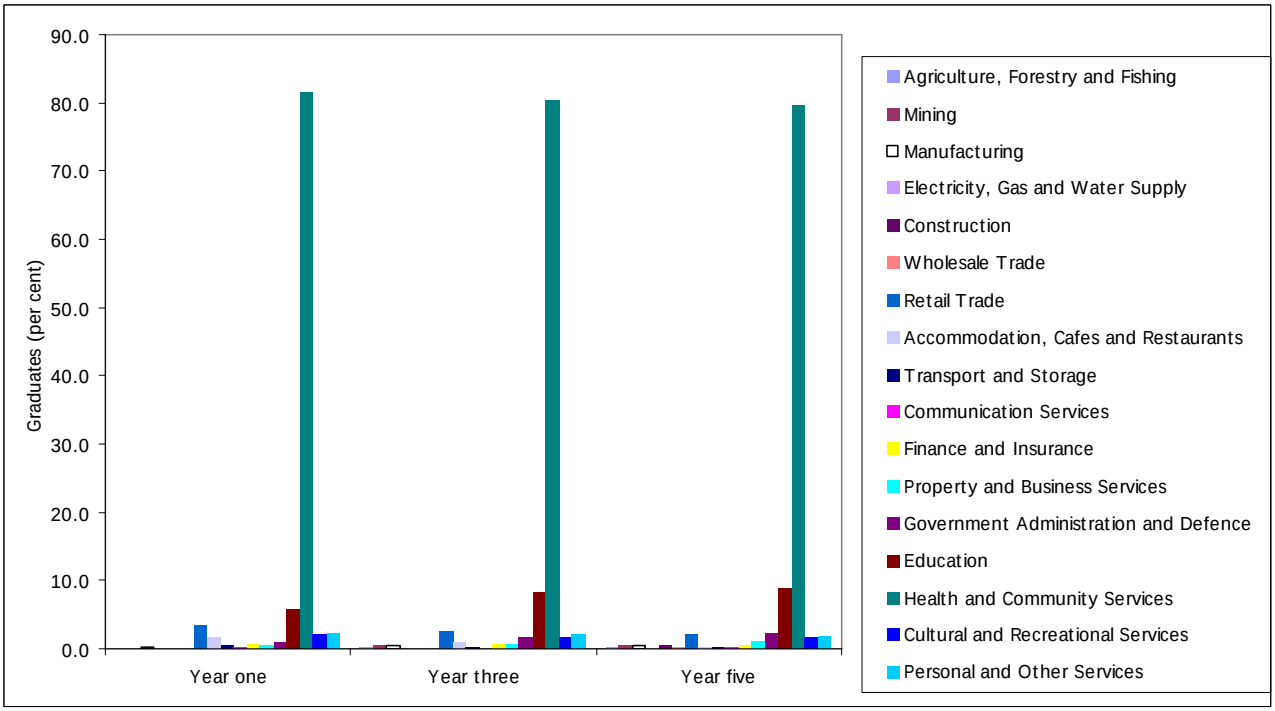

Figure 24 Health graduates' work by industry

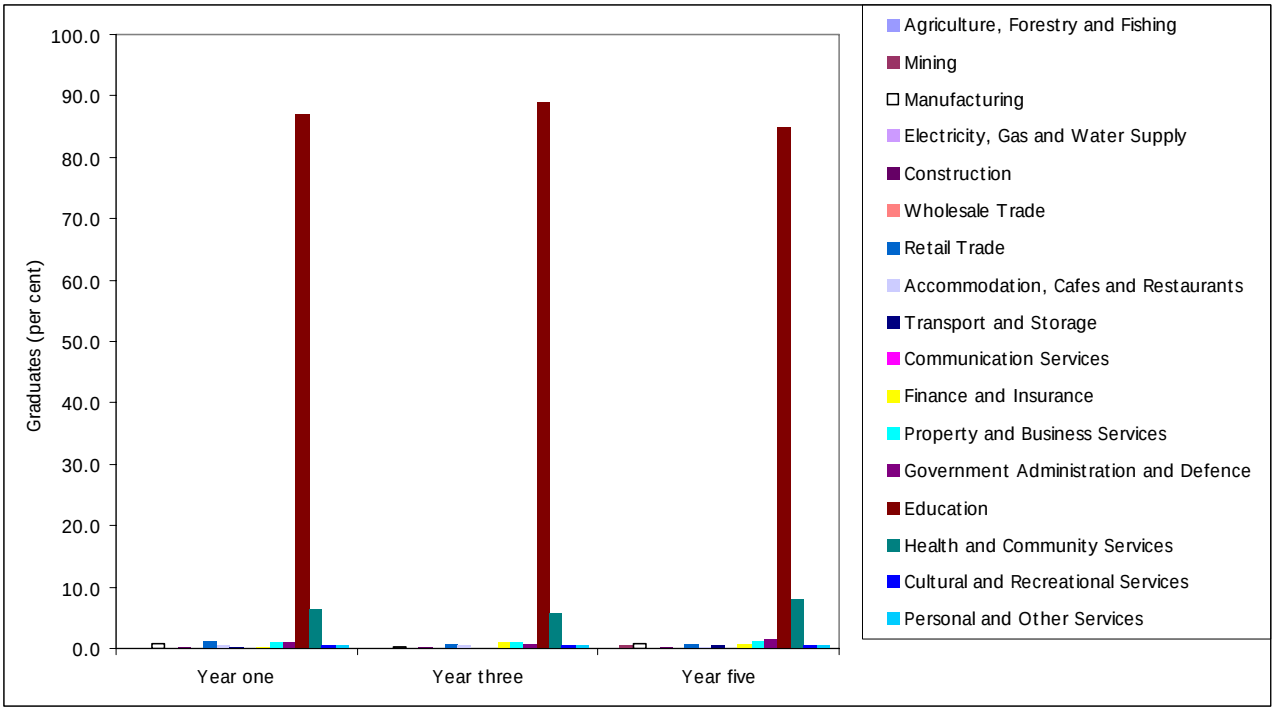

Figure 25 Education graduates' work by industry

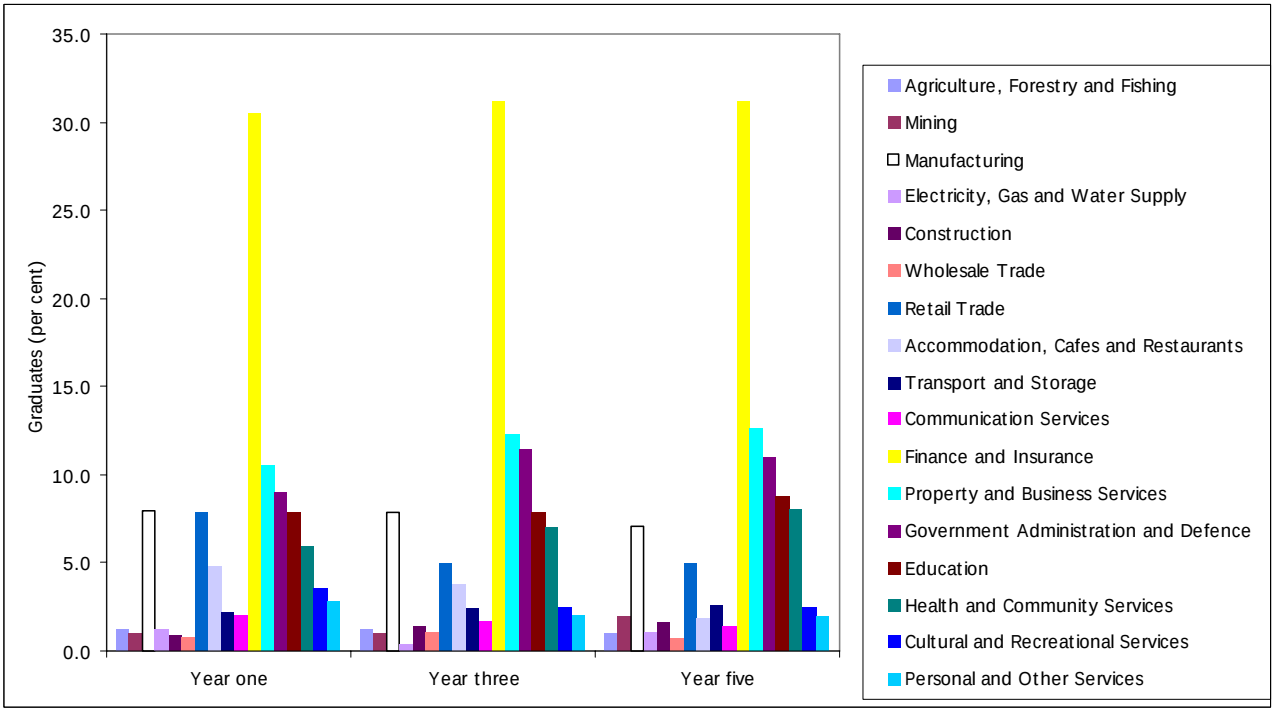

Figure 26 Management and commerce graduates' work by industry

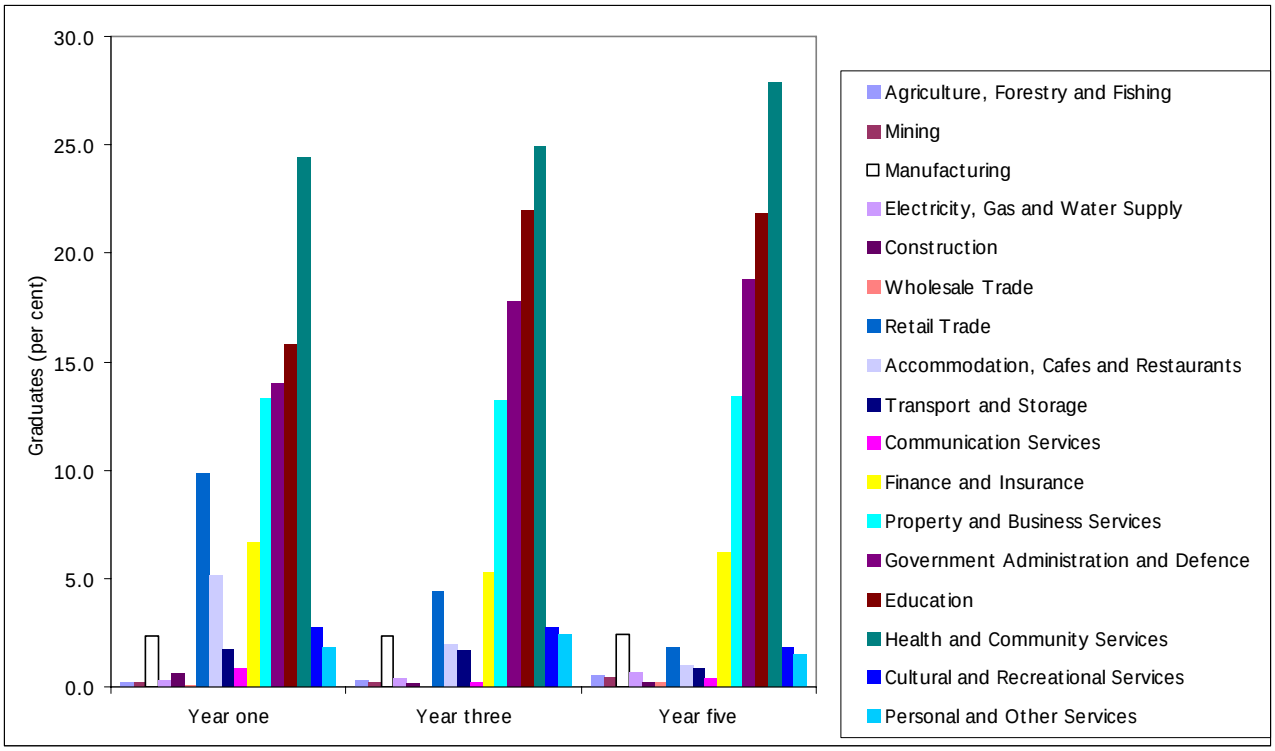

Figure 27 Society and culture graduates' work by industry

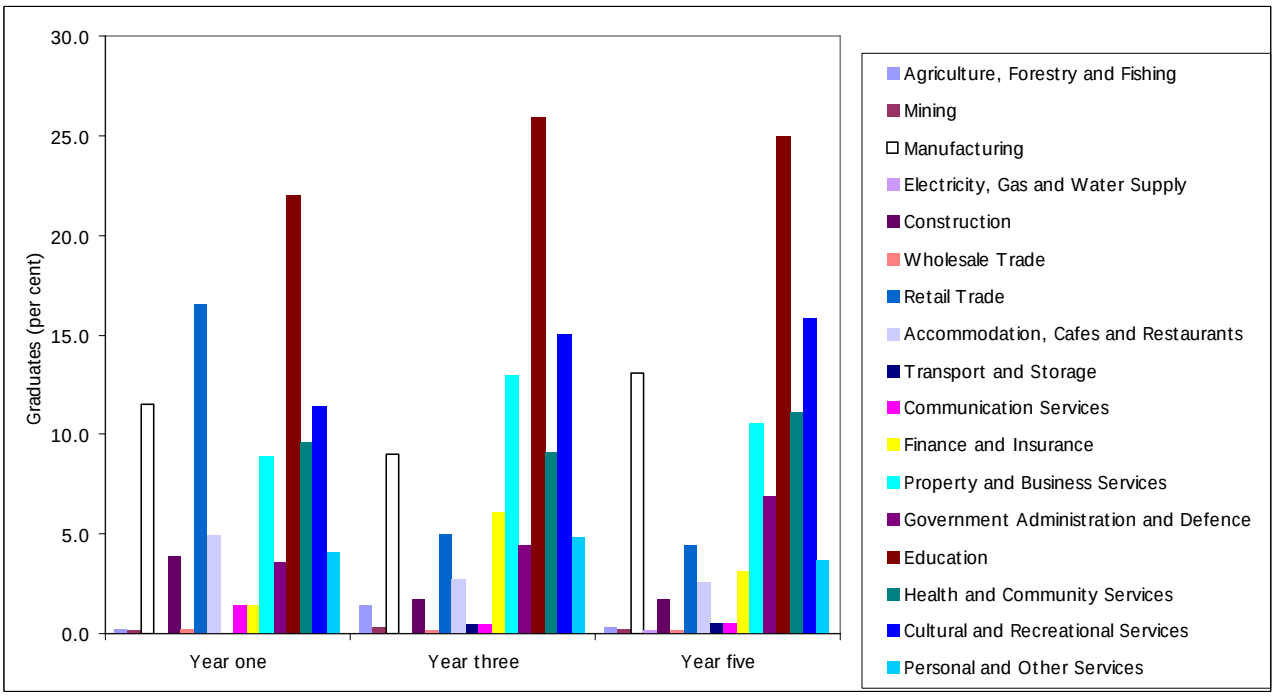

Figure 28 Creative arts graduates' work by industry

Key finding 11: The GPS provides a means of analysing how graduates from different fields move between industries. Each field of education has its own story to tell. High-level analysis of results in this area suggests that while science, IT, engineering, agriculture, management, humanities and creative arts graduates work across industries, the work of architecture, health and education graduates is more focused on specific industries.

Graduate occupation

The data from the GPQ show that the occupations of graduates changes over time. While 51 per cent of graduates worked in the higher skilled and more degree relevant occupations classed as 'professional' or 'managerial' in the first year, this rises to 63 per cent after five years. This finding is consistent with numerous international studies following the pathways of graduates in the years following completion of their degrees. In particular Purcell et al. (2005a) showed in their UK research that in many cases it is not until a few years after graduation that the benefits of a university education on labour market outcomes become noticeable.

Table 12 shows that at the five year point, this varied from 67 per cent at Go8 institutions to 59 per cent at metropolitan institutions. Among institution groups, the rate of increase is also highest for graduates from Go8 institutions (16 percentage points over five years). Other institutional groups also showed growth over the five year period, but for many, such as ATN, regional and IRU institutions, this seemed to be strong between year one and year three, and taper off between the third and fifth year after graduation.

Table 12 Occupation for employed graduates by university group (year five)

		University group				
	Total	Go8	ATN	IRU	Regional	Metropolitan
Managers	10	10	11	7	10	11
Professionals	54	58	52	57	52	48
Technicians and Trades Workers	5	5	5	4	3	4
Community and Personal Service Workers	10	5	11	10	15	13
Clerical and Administrative Workers	19	19	18	19	18	21
Sales Workers	1	2	2	1	1	1
Machinery Operators and Drivers	0	0	0	0	0	1
Labourers	1	1	0	1	1	0

International research into graduate pathways, such as the REFLEX project in Europe, have found that 'there are strong differences between fields and levels of higher education in the type of positions attained' (Allen & van der Velden, 2008: x). The GPS findings also reflect this statement. Among the fields of education, in 2008 positions in professional or managerial occupations varied from 46 per cent of graduates from management and commerce fields to 91 per cent for education graduates. Indeed, field of education accounts for marked variation in the rate of participation in professional occupations, although partly this is due to the way in which occupations are structured in ANZSCO taxonomy. Employed education graduates, for instance, are 90, 94 and 91 per cent likely to hold a professional post in the first, third and fifth years beyond graduation, while the comparison rates for IT graduates are 42, 50 and 53 per cent. There was rapid growth in professionally employed rates among graduates in science, agriculture, and management and commerce fields over the five year period following graduation.

Employed graduates with higher grades were more likely to have professional or managerial level qualifications, as were graduates who completed primary school in a metropolitan as opposed to provincial or remote location. Employed graduates were slightly more likely to have a professional qualification if their father or mother also worked at this level. As with many other outcomes, it appears that people who completed in their preferred field were consistently more likely to be working in a professional or managerial occupation than those who did not study in their preferred field. The rates for males and females were very similar over the three time periods under study.

Considering more detailed information about occupation provides further insight into the employment outcomes of bachelor degree graduates. Importantly, this offers greater clarity than analysis by industry groupings. The following analysis considers results where occupations have been coded to the sub-major level of the ANZSCO coding. Specifically, Figure 29 to Figure 42

report the twenty (of 44 sub-major) most frequently reported occupations by responding graduates sorted in descending order. Results are shown for all graduates (Figure 29), institution groups (Figure 30) and fields of education (Figure 31). In all cases, these twenty occupations account for over 90 per cent of all reported occupations. Shading is used to illustrate frequency, with the darkest shading indicating that 10 per cent or more of graduates are in the group, the mid-grey shading indicating that between five and nine per cent of graduates are in the group, and white indicating that the percentage of graduates in the group is less than five per cent. For field of education, only occupations including five or more per cent of the population are shown.

Education Professionals
Design, Engineering, Science and Transport Professionals
Health Professionals
Health and Welfare Support Workers
Specialist Managers
Numerical Clerks
Legal, Social and Welfare Professionals
Business, Human Resource and Marketing Professionals
Office Managers and Program Administrators
Engineering, ICT and Science Technicians
Arts and Media Professionals
Other Clerical and Administrative Workers
Clerical and Office Support Workers
General Clerical Workers
Inquiry Clerks and Receptionists
Chief Executives, General Managers and Legislators
ICT Professionals
Sales Assistants and Salespersons
Personal Assistants and Secretaries

Figure 29 Sub-major occupations for all graduates (year five)

Go8	ATN	IRU	Regional	Metropolitan
Education Professionals	Education Professionals	Education Professionals	Education Professionals	Education Professionals
Design, Engineering, Science and Transport Professionals	Design, Engineering, Science and Transport Professionals	Health Professionals	Health and Welfare Support Workers	Health and Welfare Support Workers
Health Professionals	Health Professionals	Health and Welfare Support Workers	Numerical Clerks	Specialist Managers
Legal, Social and Welfare Professionals	Health and Welfare Support Workers	Legal, Social and Welfare Professionals	Specialist Managers	Numerical Clerks
Specialist Managers	Numerical Clerks	Numerical Clerks	Health Professionals	Business, Human Resource and Marketing Professionals
Numerical Clerks	Specialist Managers	Design, Engineering, Science and Transport Professionals	Design, Engineering, Science and Transport Professionals	Design, Engineering, Science and Transport Professionals
Business, Human Resource and Marketing Professionals	Business, Human Resource and Marketing Professionals	Specialist Managers	Legal, Social and Welfare Professionals	Legal, Social and Welfare Professionals
Health and Welfare Support Workers	Office Managers and Program Administrators	Business, Human Resource and Marketing Professionals	Office Managers and Program Administrators	Health Professionals
Office Managers and Program Administrators	Legal, Social and Welfare Professionals	Office Managers and Program Administrators	Business, Human Resource and Marketing Professionals	Office Managers and Program Administrators
Engineering, ICT and Science Technicians	Arts and Media Professionals	Other Clerical and Administrative Workers	Engineering, ICT and Science Technicians	Other Clerical and Administrative Workers
Clerical and Office Support Workers	Engineering, ICT and Science Technicians	Arts and Media Professionals	Arts and Media Professionals	General Clerical Workers
Inquiry Clerks and Receptionists	Chief Executives, General Managers and Legislators	Clerical and Office Support Workers	Other Clerical and Administrative Workers	Clerical and Office Support Workers
Arts and Media Professionals	Inquiry Clerks and Receptionists	Engineering, ICT and Science Technicians	Chief Executives, General Managers and Legislators	Personal Assistants and Secretaries
General Clerical Workers	General Clerical Workers	General Clerical Workers	Clerical and Office Support Workers	Engineering, ICT and Science Technicians
Other Clerical and Administrative Workers	Other Clerical and Administrative Workers	Chief Executives, General Managers and Legislators	ICT Professionals	Chief Executives, General Managers and Legislators
Sales Assistants and Salespersons	Clerical and Office Support Workers	Inquiry Clerks and Receptionists	Sports and Personal Service Workers	ICT Professionals
Skilled Animal and Horticultural Workers	Sales Assistants and Salespersons	Sales Assistants and Salespersons	General Clerical Workers	Protective Service Workers
ICT Professionals	ICT Professionals	ICT Professionals	Carers and Aides	Inquiry Clerks and Receptionists
Chief Executives, General Managers and Legislators	Food Trades Workers	Skilled Animal and Horticultural Workers	Inquiry Clerks and Receptionists	Arts and Media Professionals

Figure 30 Sub-major occupations by institution group (year five)

Natural and physical sciences	Information technology	Engineering and related technologies	Architecture and building	Agriculture and environmental studies	Health	Education	Management and commerce	Society and culture	Creative arts
Education Professionals	Engineering, ICT and Science Technicians	Design, Engineering, Science and Transport Professionals	Design, Engineering, Science and Transport Professionals	Design, Engineering, Science and Transport Professionals	Health Professionals	Education Professionals	Numerical Clerks	Legal, Social and Welfare Professionals	Education Professionals
Design, Engineering, Science and Transport Professionals	Design, Engineering, Science and Transport Professionals	Specialist Managers	Chief Executives, General Managers and Legislators	Legal, Social and Welfare Professionals	Health and Welfare Support Workers		Specialist Managers	Education Professionals	Arts and Media Professionals
Health Professionals	ICT Professionals	Education Professionals	Construction Trades Workers	Education Professionals	Education Professionals		Business, Human Resource and Marketing Professionals	Health and Welfare Support Workers	Design, Engineering, Science and Transport Professionals
Specialist Managers	Specialist Managers	Office Managers and Program Administrators	Office Managers and Program Administrators	Specialist Managers			Office Managers and Program Administrators	Health Professionals	Business, Human Resource and Marketing Professionals
Legal, Social and Welfare Professionals	Numerical Clerks		Business, Human Resource and Marketing Professionals	Engineering, ICT and Science Technicians			Education Professionals	Specialist Managers	Specialist Managers
	Education Professionals			Skilled Animal and Horticultural Workers				Numerical Clerks	
	Office Managers and Program Administrators								
	Business, Human Resource and Marketing Professionals								

Figure 31 Sub-major occupations by field of education (year five)

Key finding 12: The occupations of graduates changes over time. While 51 per cent of graduates worked in occupations classed as 'professional' or 'managerial' in the first year, this rises to 63 per cent after five years. These rates, and participation in specific occupations groups, varied most by institution group, field of education, sex, average overall grade, and, to a limited extent, socioeconomic status. There was rapid growth in professionally employed rates among graduates in science, agriculture, and management and commerce fields over the five year period following graduation.

Country of work

Five years after graduation, nearly all graduates – 93 per cent – reported Australia as their country of work. This number reduced to 80 per cent for those who did not have English as their home language, 83 per cent for those who attended primary school overseas, and 86 per cent for graduates with an IT qualification.

The GPS offers a formative perspective on the international competition for talent, facilitating the analysis of graduate pathways into and out of Australia. Before considering results, it is important to note that while survey materials were not distributed to international students or people who studied off-shore, they would have been received by a large (but unknown) number of people living outside Australia who had studied on-shore. This population restriction could bias upwards the number of respondents who reported working in Australia. To be conservative, it may be best to consider the results as providing information about the mobility of graduates who may have moved abroad to study or work, but who returned to Australia after five years.

Overall, the proportion of responding graduates who were employed in Australia remains steady between 92 and 94 per cent in the five years following graduation. Among the different groups for which information was collected, it is unsurprising to see that those graduates who were not Australian citizens were less likely to be working in Australia over this period than those who are Australian citizens. Over the period, for both these groups, there is no notable fluctuation in these figures.

There are also differences associated with field of education and international mobility of graduates. The results in Figure 32 suggest a few general trends, such trends should be interpreted with caution due to the likely high non-response from graduates who were still overseas when the GPS was distributed. The first trend, associated with science, IT, engineering, and management and commerce graduates, is characterised by a decline of graduates who are working in Australia. The contrary trend, associated mainly with architecture represents graduates who depart between the first and third year after graduation, but return having spent three-to-five years abroad. A third trend is seen in the figures for graduates in agriculture, health, education, society and culture, and creative arts who spent the first year in Australia after study, but moved overseas during the three year time frame, and returned to work in Australia by the fifth year from graduation.

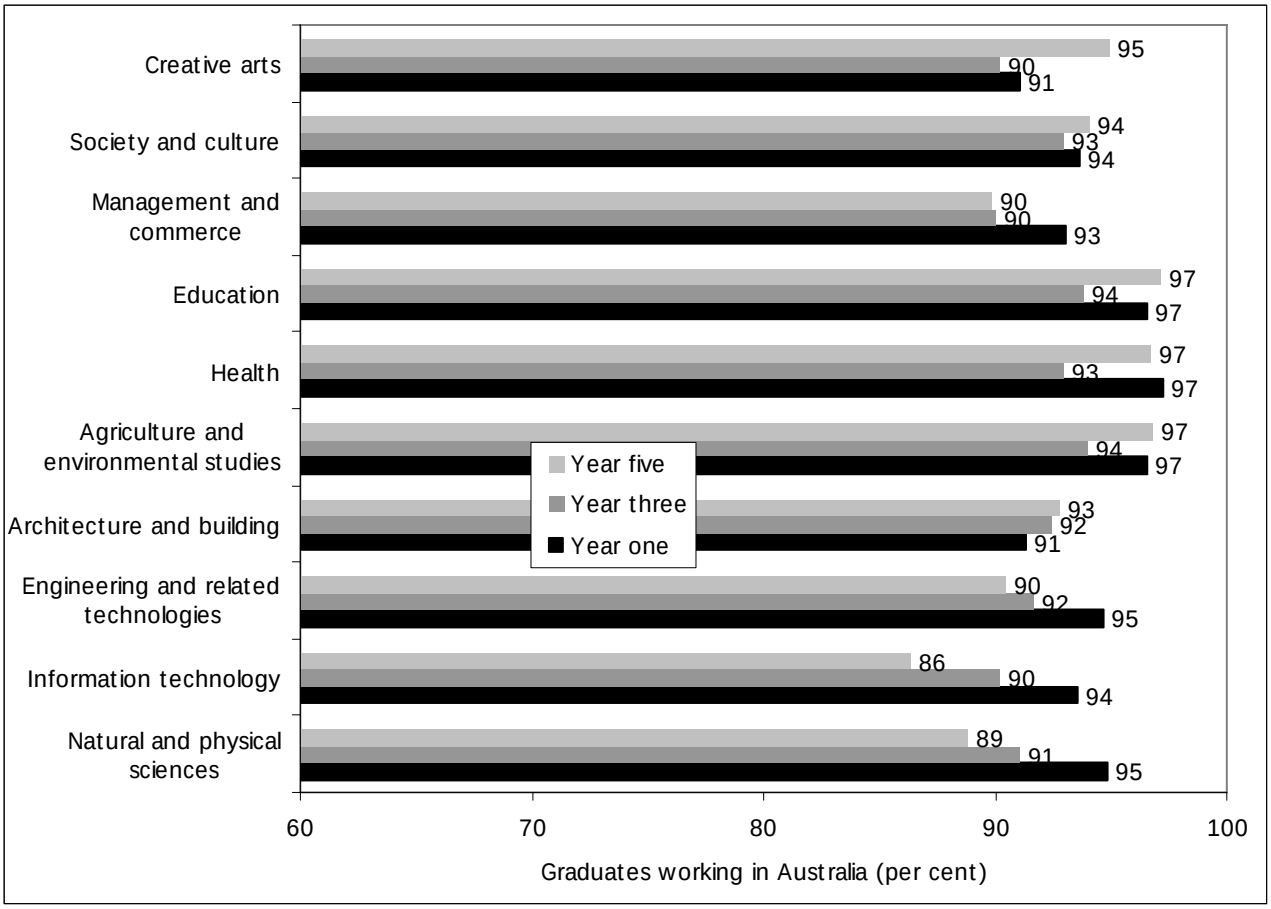

Figure 32 Graduates working in Australia by field of education

Key finding 13: Nearly all graduates – 93 per cent – reported Australia as their country of work. This number reduced to 80 per cent for those who did not have English as their home language, 83 per cent for those who attended primary school overseas, and 86 per cent for graduates with an IT qualification. However, these figures should be examined with caution due to likely non-response of those based overseas.

Length of employment

Among the graduates who were working five years after completion of their bachelor degree, the median length of time spent in their current job was 22 months. However, among the fields of education, Figure 33 shows that there was a large variation, from an average of 17 months for creative arts graduates, to 46 months for those who completed an education qualification.

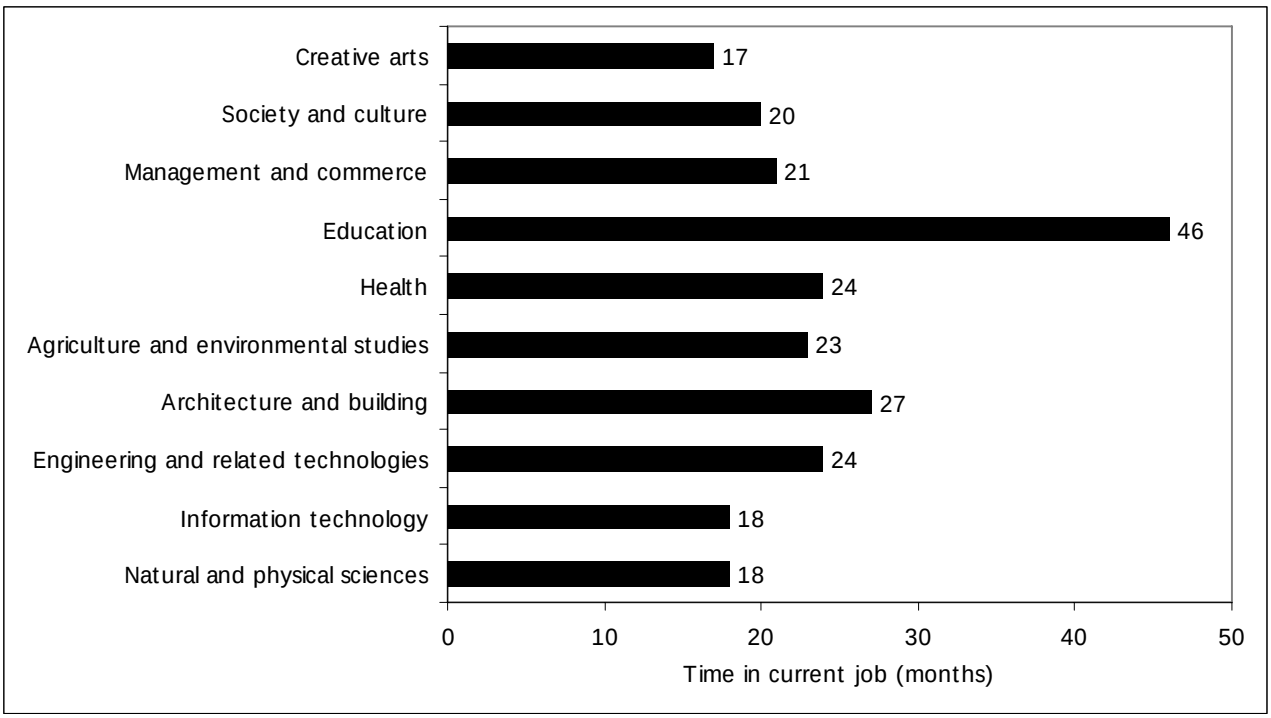

Figure 33 Time in job by field of education (year five)

Key finding 14: Among the graduates who were working five years after completion of their bachelor degree, the median length of time spent in their current job was 22 months. This varied among fields of education – from an average of 17 months for creative arts graduates to 46 months for those who completed an education qualification.

Annual salary

Salary is an interesting but imperfect measure of graduate outcomes. This is because not all graduates work for income, earnings can be hard to measure accurately, and because income is often constrained by factors such as field of education, industry, personal background and social networks. Nonetheless, aggregate salary figures provide an indication of the expected income returned following completion of a bachelor degree.

At the national level, the median graduate salary rose from $38,000 (2003 dollars) to $60,000 in the first five years post-graduation – a 58 per cent increase. The 'first year out' salary level reported by respondents in the GPS study is a close match with the figure of $37,000 reported for the 2002 graduate cohort in the 2003 Graduate Destinations Survey (Graduate Careers Council of Australia, 2003: 12). At the five-year mark the salary for the middle fifty per cent of graduates ranged from $47,726 to $78,000. These figures compare favourably with the average weekly earnings of all workers in Australia, which according to the ABS was $46,332 in May 2008 (ABS, 2008).

Median salaries differ within the university groupings. Starting salaries varied between graduates from different institutional groupings – from $35,000 and $36,000 at Go8 and IRU to $40,000 at ATN and regional institutions (all 2003 dollars). Figure 34 shows that Go8 graduates tended to see the largest steady increase in salary over five years from $35,000 (2003 dollars) to $63,000 – an 80 per cent increase. ATN graduates salaries increased from $42,000 (2003 dollars) to $64,000 (60%). IRU, regional and metropolitan university graduates' salaries increased at slightly lower rates to reach $56,000 (up 56%), $61,000 (up 51%) and $60,000 (up 54%) respectively.

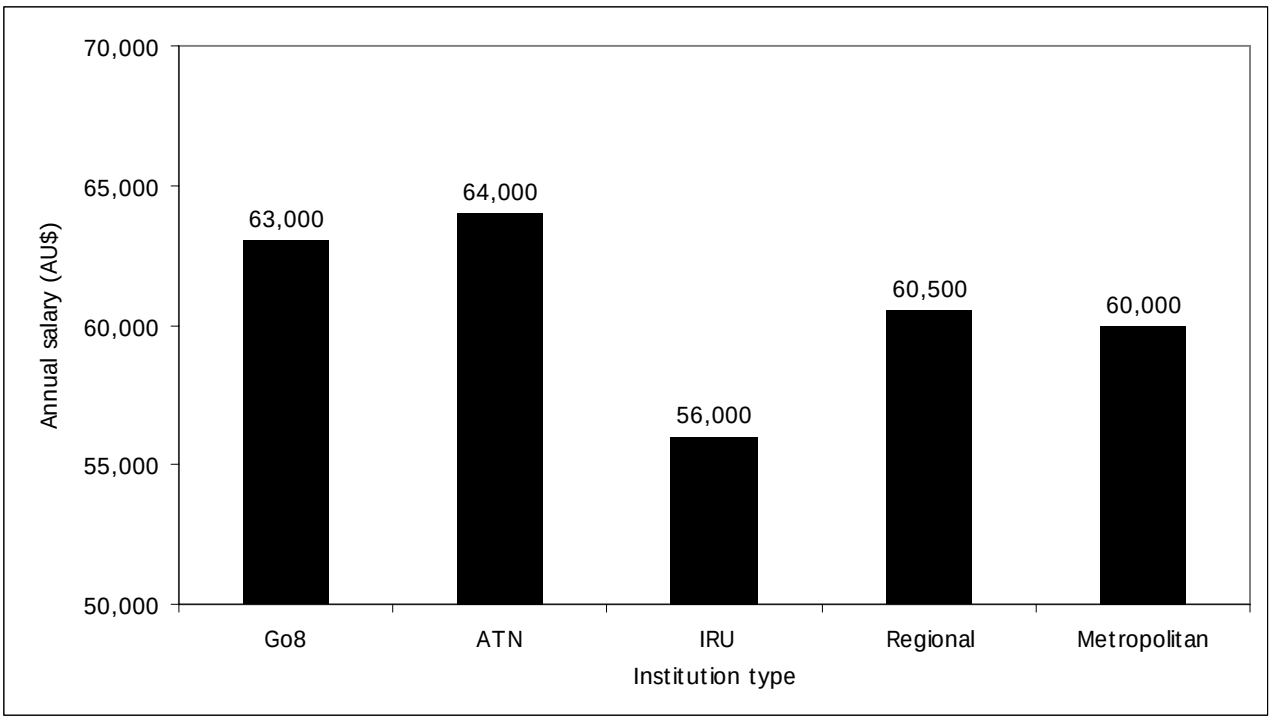

Figure 34 Graduate salary by institution type (year five)

As with many other aspects of graduates' outcomes, field of education is associated with considerable variation in graduate salaries. Overall, there is a marked growth in salaries across all fields of education in the five years following completion of a university degree (see Figure 35). Among the fields, some experienced much larger growth than others. Engineering graduates (who are in a field of peak demand) experienced a median salary increase from $42,000 (2003 dollars) in their first year out of university to $78,000 by their fifth year. Over the same period, Education graduates' salaries increased from an equivalent starting point, $42,000 (2003 dollars) to $56,000. Interestingly, among the fields, Education graduates went from being the equal highest paid in their first year after university, to second lowest (of 10 fields analysed) by the fifth year after graduation.

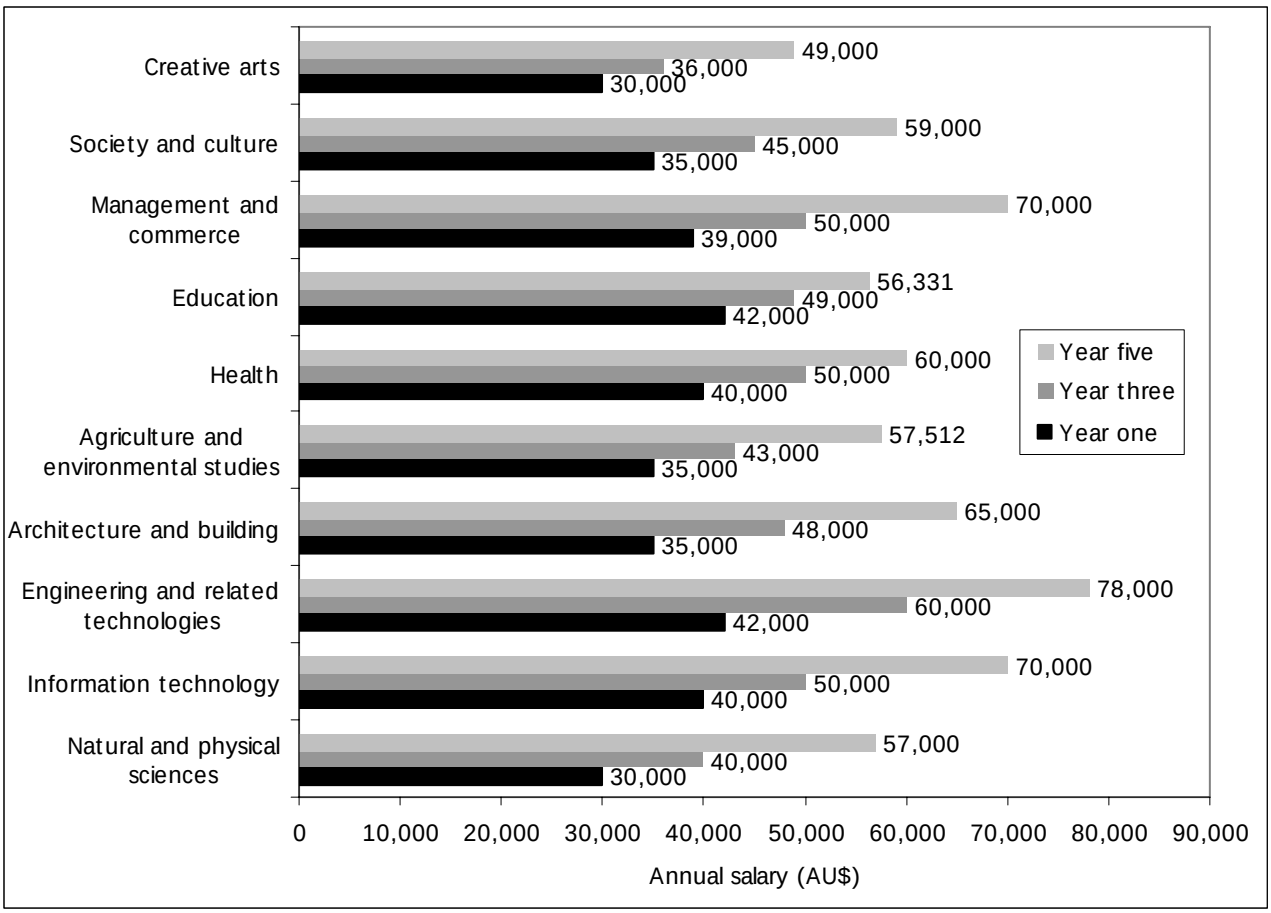

Figure 35 Annual salary by field of education

The average grade reported by graduates was associated with a difference of $3,000 in salary, a difference which sustained across the first-, third- and fifth-years of study. That this difference is not great affirms that graduates with higher grades do not necessarily work in positions linked with higher salaries, and also that a range of factors mediate salary other than grade.

Age was associated with higher salaries across all three years, although the range of change reduced for older cohorts. While graduates between 21 and 30 years saw an increase of $25,000 in their median salaries over the first five years, graduates in the 51 to 60 year age bracket saw an increase of only $13,000.

There were notable differences in these figures when examined by sex. The median salary for males five years after completion of a Bachelor degree is $70,000 compared with $57,000 for females. Males and females working part time had the same median salary. The difference lay in terms of median salary for those in full-time work – $70,700 for males and $60,000 for females.

Figure 36 illustrates a progressive widening in the first, third and fifth years after graduation. Median male graduate salaries rise from $40,000 (2003 dollars) to $50,000 (2005 dollars) to $70,000 at each point of time recorded, while the gap between male and female median salaries increases from $3,000 to $5,000 to $13,000. These issues are explored in greater detail in the next chapter.

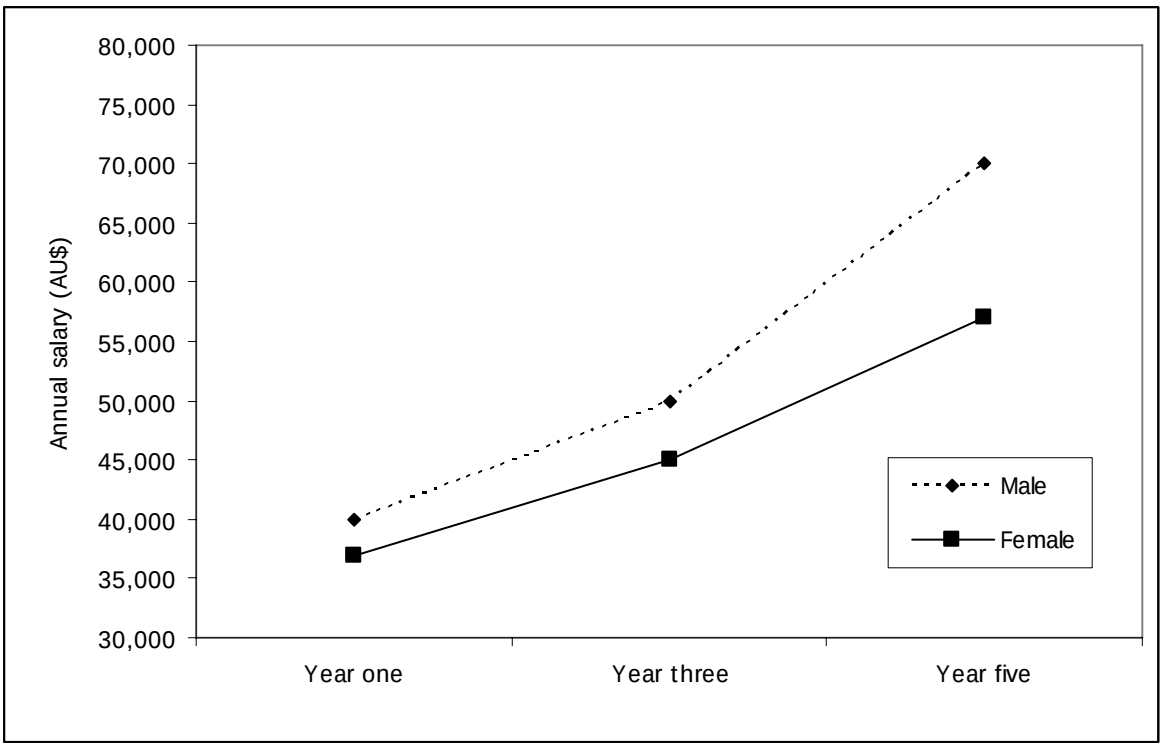

Figure 36 Annual salary by sex

Very few other demographic variables appeared to be linked with trends in salary, although there were a few small differences of note. Differences of $3,000 and $4,000 opened up between graduates reporting disabilities and others over the period.

Key finding 15: At the national level, the median graduate salary rose from $38,000 to $60,000 in the first five years post-graduation – a 58 per cent increase. At the five-year mark the salary for the middle fifty per cent of graduates ranged from $47,726 to $78,000, which compares favourably with the average weekly earnings of $46,332 for all workers in Australia. Median salaries differ within the university groupings and, as with many other aspects of graduates' outcomes, there was considerable variation by field of education. Males reported consistently higher salaries than females, a difference with grew across the five-year period under study.

Work satisfaction

Work satisfaction is also an indicator of good outcomes for individuals. As such, graduates who were employed were asked how satisfied they were with their work five years following completion of their bachelor degree. Nationally, on a metric ranging from 0 to 100, the average satisfaction rating among employed graduates was 69 – up from 58 in the first year after graduation. However, levels of satisfaction with work did vary across different graduate groups. As Figure 37 shows, there was a positive relationship between average grade during university studies and satisfaction with work five years after graduation. Graduates who had completed their degree in their preferred field of education were also more satisfied than those who had undertaken a non-preferred degree (70 compared with 60). There was also difference within the fields of education on this measure.

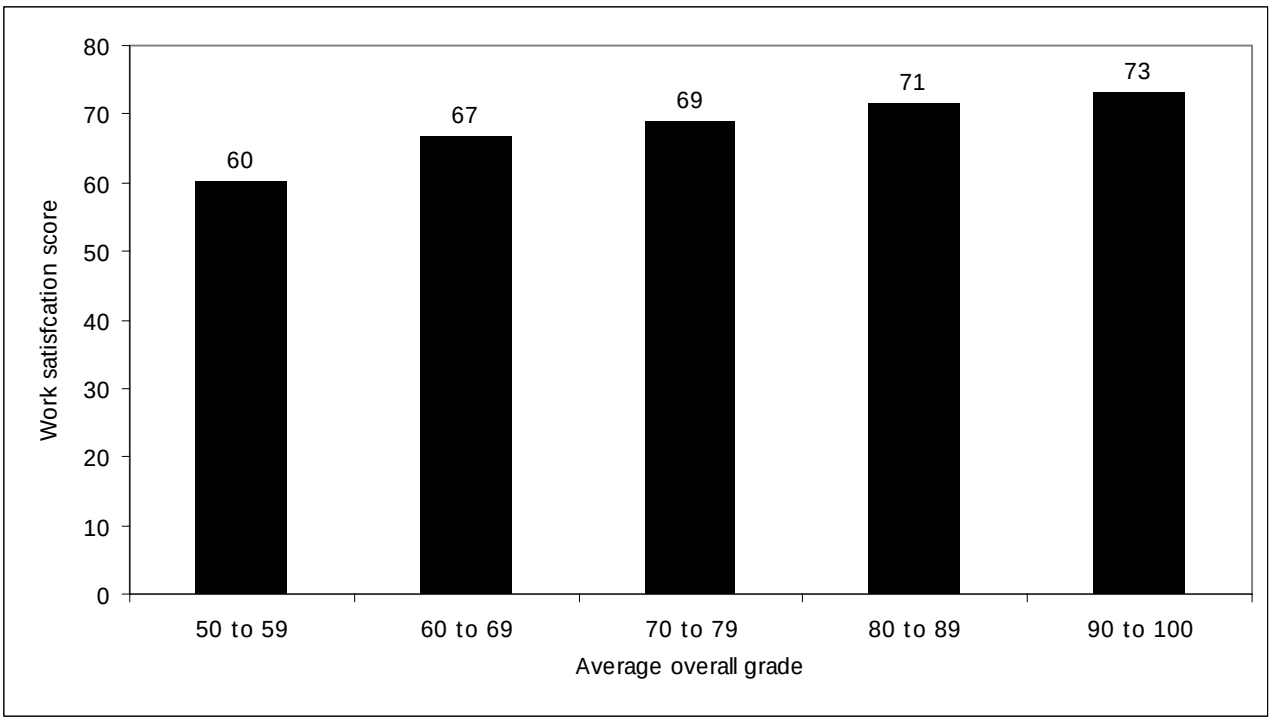

Figure 37 Graduate work satisfaction by average overall grade (year five)

As in many other areas of the GPS, field of education explained quite a large amount of variation in graduates' satisfaction with their work. Figure 38 shows that while there was considerable variation between fields in the first year after graduation, for a range of reasons the variation in most fields narrowed after five years. While creative arts graduates reported being the least satisfied in their first year of work, for instance, their level of satisfaction had increased after five years, although remained lower than for health, education and architecture graduates. Education graduates reported being the most satisfied one year out, and satisfaction levels of these graduates remained high without major growth.

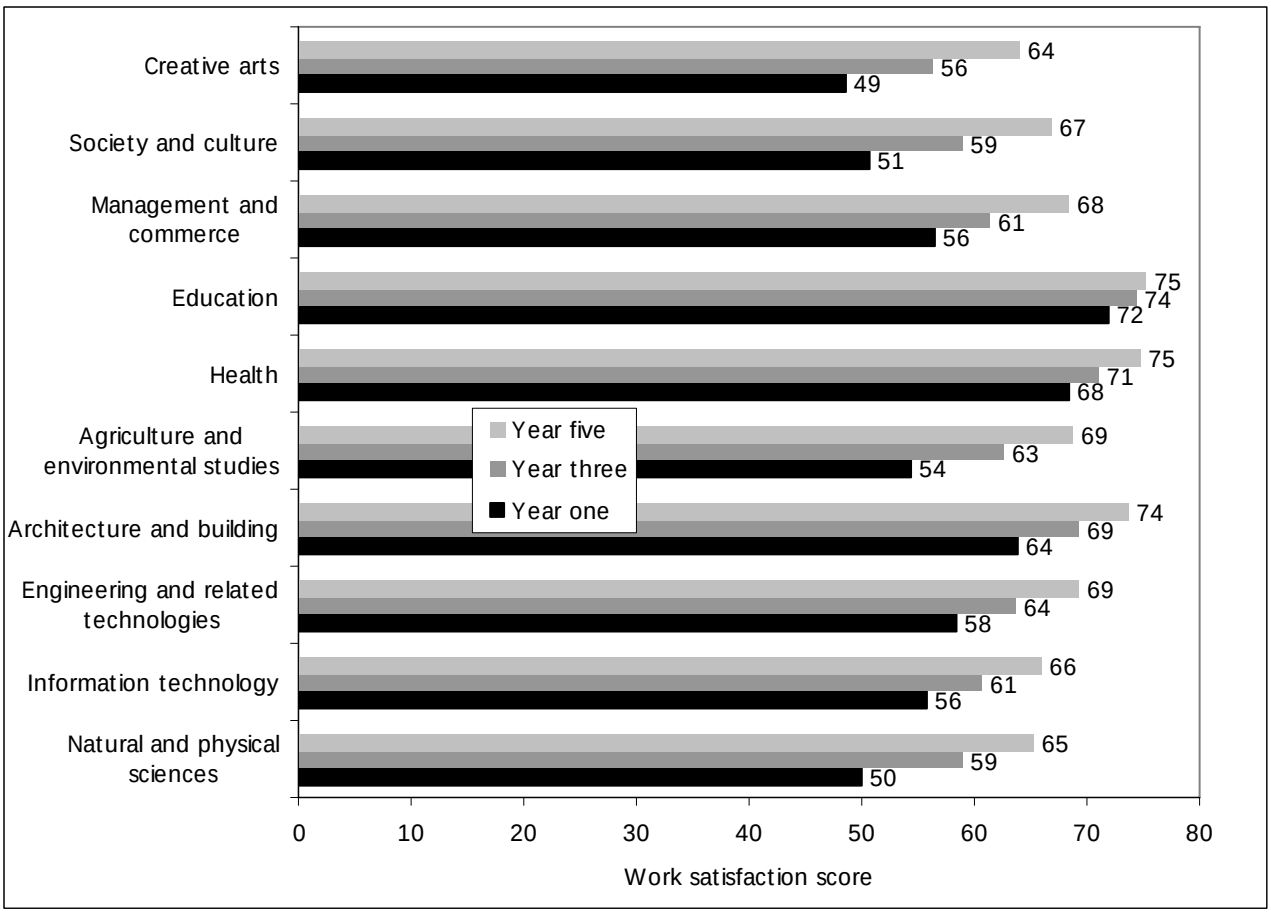

Figure 38 Work satisfaction by field of education

Key finding 16: Graduates were broadly satisfied with their work, with mean scale scores increasing from 58 to 69 across the first five years after graduation. There was a positive relationship between average grade during university studies and satisfaction with work five years after graduation, and graduates who had completed their degree in their preferred field of education were more satisfied than those who had undertaken a non-preferred degree (70 compared with 60). As in many other areas of the GPS, field of education explained quite a large amount of variation in graduates' satisfaction with their work.

Tricia completed her bachelor of nursing in 2002, having entered university straight after finishing senior secondary studies in rural Queensland. Her father was a vegetable farmer and her mother managed the home. Both her parents has secondary but not tertiary education. Tricia has siblings who attended university before her. Nursing was a field of interest to Tricia, and she studied hard to achieve average marks in the 80s and become registered as a nurse. She was happy with the support and advice provided by her university, although she saw that there could be greater use made of real-life case studies, and more interactions between students and staff.

Jake felt that his degree was worth the cost time and effort and if he started all over again he would definitely study in the same area and attend the same university. While he was satisfied with his overall educational experience during the bachelor degree, he felt that more importance should be given to skills such as reading, writing, speaking and problem-solving and that teaching staff should have current workplace experience and knowledge in order to enhance graduates' employability and skills.

6 SELECTED PROFILES AND PATTERNS

> Core units like marketing, management [were least relevant]. These units teach you jargon and do not test actual risk assessment, problem solving abilities. Good to give graduates a flavour for other areas I guess… (31 year old Banking and Finance graduate)

> As a journalist, a study of English literature widened my reading horizons and helped to develop my written communication skills. Also helpful practise working autonomously to deadlines. [28 year old female psychology graduate]

Introduction

As the previous analyses suggest, the GPQ captured a considerable amount of data that provides new insights on the outcomes of university education in Australia. In the 2008 GPS report it is only possible to provide a snapshot of key findings. Analytical possibilities will only emerge through further consideration of the implications of this new perspective.

This chapter offers further insights into a select number of potential areas of interest that the GPS data can help to explore. In doing so, it illustrates the kinds of analysis that can be undertaken using this collection and hence the value that it adds to our understanding of higher education in Australia.

It looks first at outcomes for three demographic groups – males and females, graduates from disadvantaged backgrounds, graduates who come from regional areas, and graduates who participated in paid work during their study. Outcomes are then analysed for a number of key fields of particular policy interest – science, engineering, education and nursing graduates. Together, these results affirm the value of the GPS in providing insight into outcome differences associated with people's backgrounds on entry to university, and outcomes associated with graduates in particular field or industry areas.

Outcomes for key demographic groups

Analysis of male and female graduate outcomes

The outcomes of males and females have been mentioned briefly in the previous chapter in relation to some of the variables measured in the GPS. This section contains a more concentrated analysis comparing the perceptions, educational experiences of male and female graduates over the five years since completing their degree. It examines field of education preferences, course satisfaction, labour force participation and work and salary differences.

Males and females make different choices when it comes to the fields in which they study. As Figure 39 shows there are large differences in the health and education fields, which females are more likely to choose, and the information technology and engineering fields, which are much more popular among males. Such choices of field of education play a part in the differences in the occupations and incomes of males and females five years after graduation.

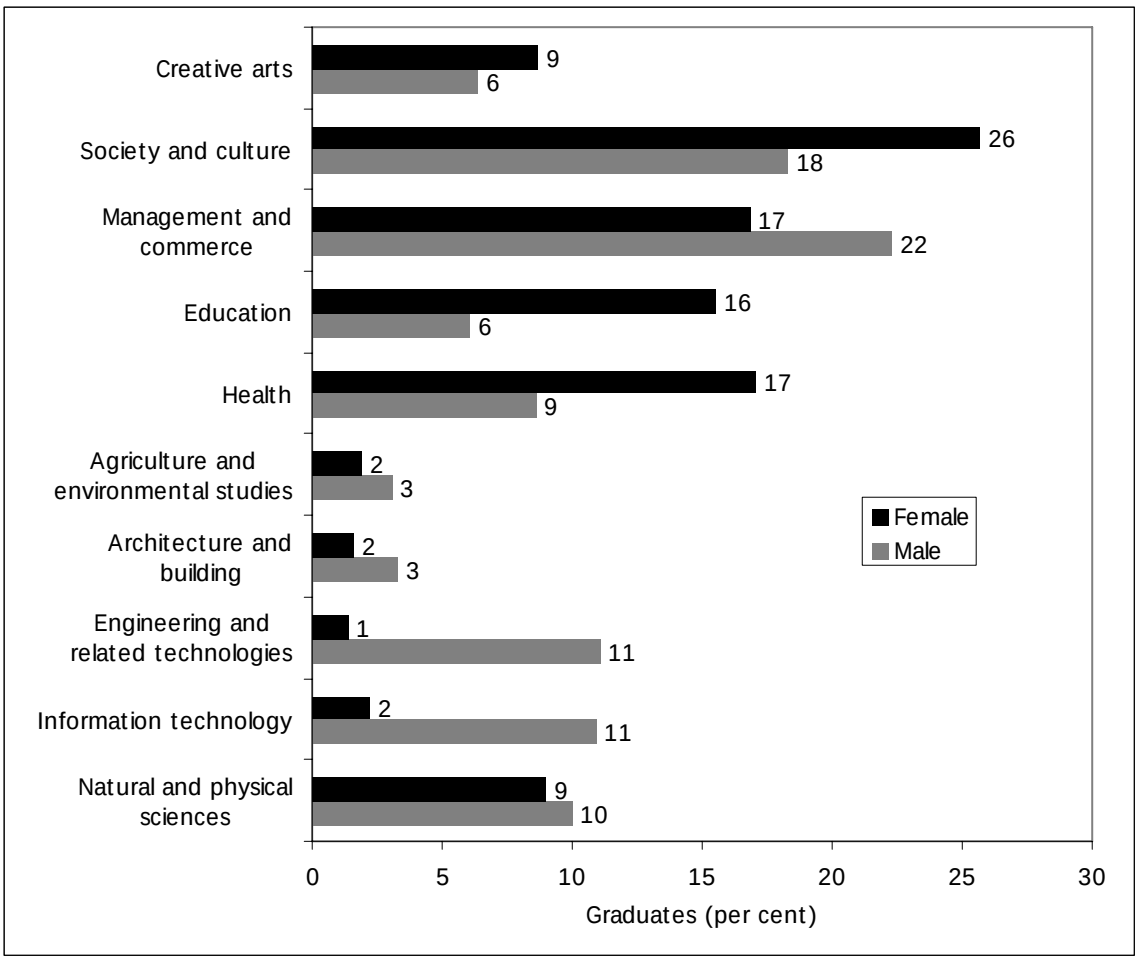

Figure 39 Field of education by sex

At the time of completing their bachelor degree, males and females were equally likely to study as full-time and internal students (69 per cent) and to complete a degree in their preferred field (93 per cent). Both were equally likely to be working for pay during study for between 11 to 20 hours. On average, males were 24 at the time of graduation in 2002, while the average age of females was 23.

Male and female educational outcomes from their 2002 degree were broadly similar, with a few interesting differences. While self-reported general learning outcomes were the same (61 out of 100), females reported achieving more than males in terms of general development (47 compared with 42 on the 100-point scale). Females reported a slightly higher mean overall academic achievements grade than males, with an average grade of 76 compared with 74 for males.

Perceptions of the value of study were on par, with both males and females being equally satisfied with aspects such as careers advice (39 out of 100), the entire educational experience (67 out of 100), the cost, time and effort (78 out of 100), and whether they would attend the same institution or redo the same degree if starting over again (74 and 65 out of 100 respectively). Further, the 2002 degree was seen by both genders to be equally relevant to further study (40 out of 100) and to graduate work in first (40 out of 100), third (38 out of 100) and fifth (33 out of 100) years after graduation. Despite this broad similarity, females indicated they saw a greater need to enhance learning contexts, and staff and teaching in universities compared with males (59 compared with 67, and 63 compared with 70 on a 100-point scale).

The 2008 GPS shows there were some differences in the engagement in study following the bachelor degree between males and females. Males were more likely than females to be involved in

further study in the first and third years after graduation (42 per cent compared with 40 per cent, and 43 per cent compared with 40 per cent), but slightly less so after five years (37 per cent compared with 39 per cent). The differential rates of participation in postgraduate degrees are interesting – 23 compared with 20 per cent in the first year and 27 per cent (males) compared with 24 per cent (females) in the third year. After five years, females were more likely to have a postgraduate coursework degree as her highest qualification (26 per cent compared with 23 per cent), while males were more likely to hold a postgraduate research qualification (8 per cent compared with 5 per cent).

Interestingly, when labour force participation rates are examined over the five year period after university completion, there are substantially different patterns between males and females. The labour force is defined here as the total number of people who are working or who are not working but are actively seeking work. The labour force participation rates are therefore the proportion of the whole cohort who are either employed or actively seeking employment. The unemployment rate (used in later analyses) is the proportion of people in the labour force who are actively seeking work.

As Figure 40 shows, female labour force participation is higher than that for males in the first year after graduation. By the third year, participation rates between the sexes are almost identical and by the fifth year, males have a much higher rate than females. The rates of labour force participation rise for both sexes over this period, but while the increase for females is minimal (90 per cent to 91 per cent), the rise for males is substantial (87 to 96 per cent).

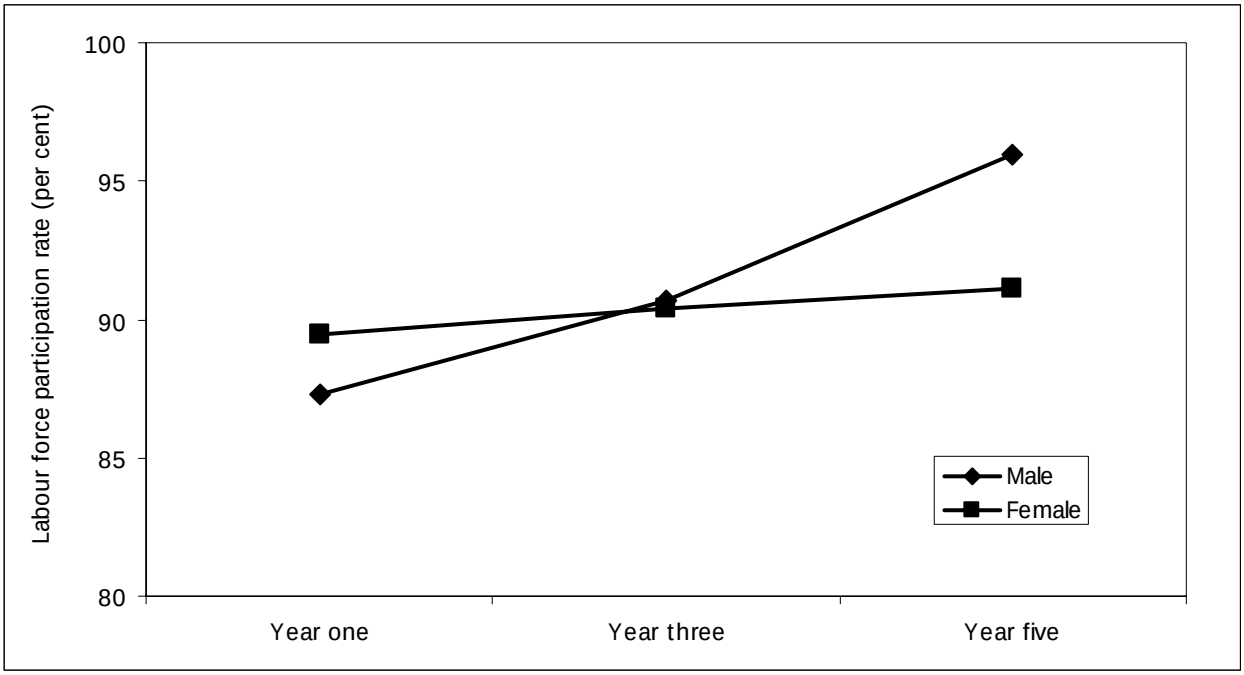

Figure 40 Labour force participation rate by sex

Between the sexes, females were only slightly less likely to be in full-time employment one year out. However, the difference between males and females grew to 15 percentage points after five years (84 compared with 69 per cent) – see Figure 41. Previous research has found a similar gap in male and female full-time work participation levels. For example, Marks (forthcoming) found similar changes in male and female full-time employment rates in the early years following graduation in Australia. In addition, research undertaken examining UK graduates work status three to four years after graduation, found that 70 per cent of males and 66 per cent of females were in full-time work (Prucell et al. 2005a). The GPS figures at three years out show the male rate – 74 per

cent – to be higher than that reported for the UK, while the GPS female full-time employment rate of 67 per cent was only slightly higher than the rates in the UK research.

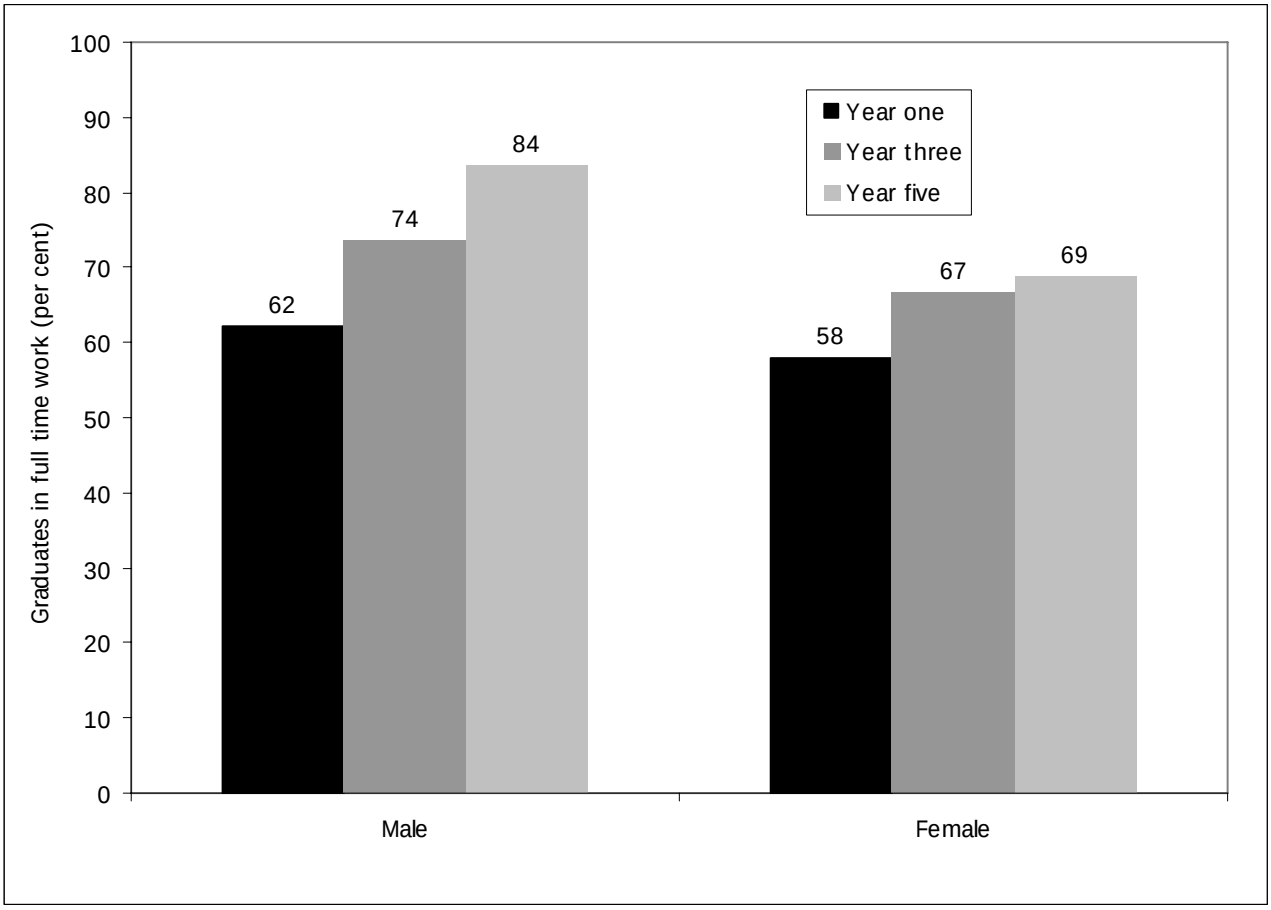

Figure 41 Participation in full-time paid work by sex

It is likely that the results shown in Figure 40 and Figure 41 are linked closely with occupational and lifestyle choices that may be different between the sexes in the period following university graduation. Both quantitative and qualitative data from the GPQ highlight these differences.

Figure 42 shows that there are substantial differences in the most common occupations of males and females. As per the figures in the previous chapter, the darkest shading in this figure indicates that 10 per cent or more of graduates are in the group, the mid-grey shading indicating that between five and nine per cent of graduates are in the group, and white indicating that the percentage of graduates in the group is less than five per cent. The most common occupation for males – design, engineering, science or transport professionals, was much further down the list of common occupations among females. Similarly, females were much more likely to be employed as health and welfare workers or as health professionals.

Male	Female
Design, Engineering, Science and Transport Professionals	Education Professionals
Education Professionals	Health and Welfare Support Workers
Specialist Managers	Health Professionals
Numerical Clerks	Legal, Social and Welfare Professionals
Legal, Social and Welfare Professionals	Numerical Clerks
Health Professionals	Specialist Managers
Office Managers and Program Administrators	Business, Human Resource and Marketing Professionals
Business, Human Resource and Marketing Professionals	Design, Engineering, Science and Transport Professionals
Engineering, ICT and Science Technicians	Office Managers and Program Administrators
Health and Welfare Support Workers	Clerical and Office Support Workers
Arts and Media Professionals	Other Clerical and Administrative Workers
Chief Executives, General Managers and Legislators	Arts and Media Professionals
ICT Professionals	General Clerical Workers
Inquiry Clerks and Receptionists	Inquiry Clerks and Receptionists
General Clerical Workers	Engineering, ICT and Science Technicians
Other Clerical and Administrative Workers	Chief Executives, General Managers and Legislators
Clerical and Office Support Workers	Sales Assistants and Salespersons
Protective Service Workers	ICT Professionals
Sales Assistants and Salespersons	Protective Service Workers

Figure 42 Sub-major occupations for males and females (year five)

In addition to these occupational differences, there is another key factor differentiating males and females over this period of time relating to family formation and obligations for child rearing. According to the ABS, the median age at first birth for women is 27.8 years (ABS, 2007). The average age of the females participating in the GPS was 28 years. In addition to this, Australian research by Heard (2008) has shown that females in this age group are much more likely to be partnered than males, and that women with degrees are more likely to marry men with similar or higher qualifications, who on the whole earn larger salaries and therefore have a greater capacity to support a partner caring for children at home. Qualitative data from the GPQ suggests that a notable minority of women were occupied in child rearing and domestic roles five years after graduating from their bachelor degree.

In the GPQ, respondents were asked what their 'main activity' was at one, three and five years following graduation. Analysis of responses to this question at five years after graduation reveals that a number of women specifically indicated that they were engaged primarily in a domestic role, caring for children or being a 'mum'. Of all female respondents to the main activity question at five years after graduation, seven per cent indicated their main activity was related to child rearing or a related domestic role. At the other end of the spectrum, the proportion of males who indicated their main activity was a similar domestic role was miniscule – 0.1 per cent of male respondents.

These findings help to explain the lower full time rate of women who are employed and also contribute substantially to explaining the differences in labour force participation between men and women over the five year period after graduation.

The median earnings reported in the previous chapter for females five years after graduation, $57,000 per year, are notably below to those of males, $70,000 per year. However, these figures are relatively crude because they do not account for a number of factors that are more prevalent among women than men and contribute to lower salaries. The brief analysis below examines some of these issues and re-analyses wage differentials after controlling for a number of these factors. The results show that even when a number of characteristics and other variables are taken into account, women appear to have lower salaries than men.

As indicated above, the rates of full-time work between men and women were notably different – especially five years after graduation (Figure 41). Also shown earlier were the differences between the sexes in choice of discipline for study (Figure 39). As would be expected, these study choices result in notable differences in industry of occupation between males and females. Females have a larger presence in health, education, hospitality and personal services. By contrast, the mining, communication services, finance, and electricity, gas and water supply industries all have much larger proportions of males employed than females. In addition, five years after completion, males are more likely to hold an occupation classified as professional or managerial. As shown from the results in the previous chapter, these factors all contribute to differences in salaries.

In order to control for many of these factors, a regression model was specified to help determine the difference in male and female salaries net of the potential influence of a number of variables. The variables controlled for in the model include age, work status (part time, full time), occupation type (professional/managerial, other), enrolment in current study, field of education and industry of occupation. This model explained 34 per cent of the variation in graduates' salary five years after Bachelor degree completion.

The results indicate that when controlling for the range of factors noted above, gender still has a notable influence on graduate salaries. In total, the model predicts that five years after graduation males are estimated to earn around $7,800 per year more than females, regardless of occupation type, industry, field of education, age, involvement in study and part time status. The 95 per cent confidence range for this outcome is between $7,400 and $8,200.

Running the same model on the variables relating to the employment situation of graduates in their first and third years following university graduation sheds further light on the gender differences in salary over the first five years following completion of a bachelor degree. The results show a steady increase in the salary gap. In the first year out of university, the gap is just over $2,000 in favour of males, growing to $3,300 by the third year out of university and then jumping substantially to $7,800 by the fifth year.

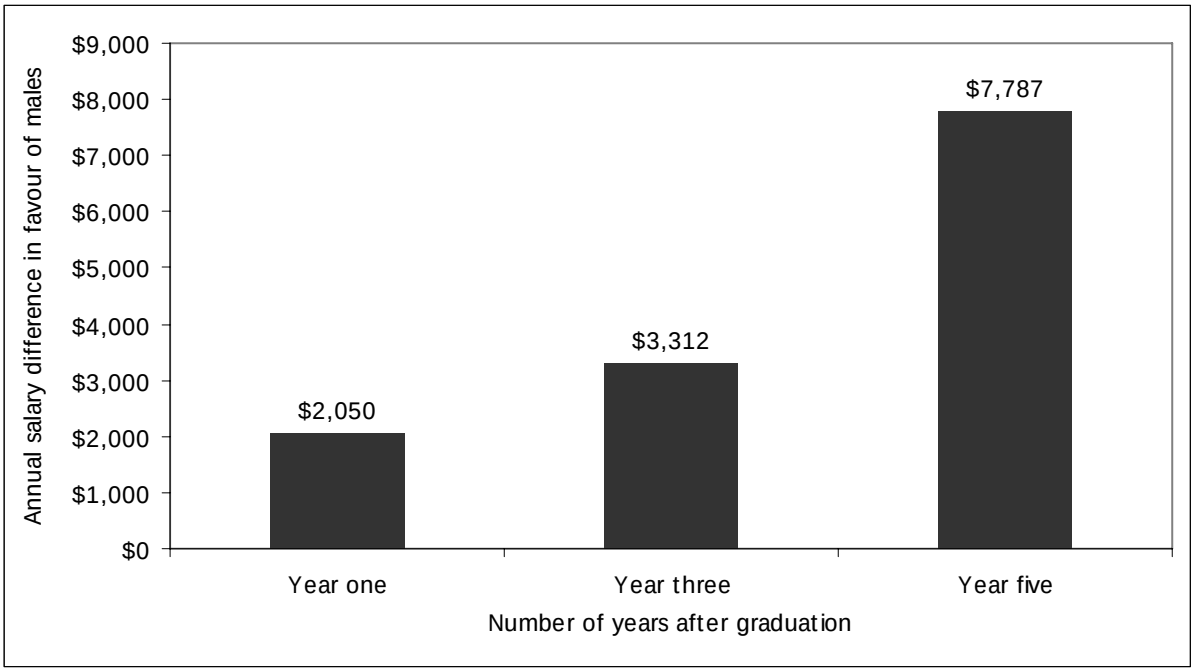

Figure 43 Salary difference by sex

This change in salary between males and females also grows proportionate to the overall growth in average salaries over this time. In the first year, the salary difference between males and females is equivalent to 5 per cent of the overall average salary, by the third year the difference is 7 per cent and by the fifth year, the difference is 12 per cent of the mean salary.

Together, these findings are substantial. They show that there are still clear gender differences apparent among higher degree educated people five years after completing university studies even after controlling for a range of other influences on salary.

Key finding 17: Males and females make different choices in terms of courses for their bachelor degrees and have slightly different perceptions on how such courses could be improved in the future. Labour force participation rates for females are higher than for males in the first year after graduation, but much lower by the fifth year. Engagement in full time work is much higher for male than female graduates and this difference grows in the five years after bachelor degree completion. One key reason for these findings relates to women's engagement in domestic roles by the fifth year after graduation. Of all female respondents at five years after graduation, seven per cent indicated their main activity was related to child rearing or a related domestic role. The difference in male and female salaries increases among higher degree educated people five years after completing university studies, even after controlling for a range of other influences on salary.

Graduates from disadvantaged backgrounds

An important outcome of higher education, both for individuals, institutions and the system overall, is the extent to which it facilitates the access, retention and success of people from disadvantaged backgrounds. As suggested in chapter two, a major indicator of the productivity of university education is the extent to which it can enable people from disadvantaged backgrounds to successfully complete a university degree.

Several measures of social disadvantaged were collected in the GPQ, including a range of exploratory measures such as primary school postcode, sibling education, and parental education and occupation. A composite variable was calculated for the current analysis, which flagged people as having a disadvantaged background if they reported having all of these characteristics (as possible to determine given available data):

- neither mother nor father employed in professional occupation
- neither mother nor father attended university, and
- childhood postcode in the lowest 25 per cent by socioeconomic status.

This group includes several target equity groups (DEET, 1990; Coates & Krause, 2005; CSHE, 2008). Clearly, this is a very important group of people for university education in Australia to assist.

By this definition, 12 per cent of the GPS 2008 sample were classified as having a disadvantaged background while 88 were not. This is a very stringent definition which is likely to under-report the disadvantage in the population of 2002 bachelor degree graduates. It's attraction is that it builds a definition which takes account of multiple forms of disadvantage. If the educational and vocational outcomes of these graduates is equal to those of others then this is a good indication that bachelor degree study has helped enhance the prospects of those from disadvantaged backgrounds.

Graduates identified with this kind of disadvantaged background were equally likely to work for pay during their study or be male or female. They were more likely, however, to:

- attend IRU or regional institutions
- study in the fields of education, engineering, IT or business
- attend by part-time or external mode
- be slightly older than others
- have a non-English speaking background
- be Indigenous
- identify as having a disability, and
- come from a provincial or remote area.

While these students may have arrived at university from disadvantaged backgrounds, there was no difference in their self-reported educational performance. Their learning and development outcomes as well as their average overall grades were on par with those of other students. This result affirms that reported by Coates, Friedman, Ball and Le (2009). Similarly, they were equally satisfied with their study, including with careers advice, overall educational experience, and value for time and money. Their bachelor degrees were seen to be of equal relevance to further study and work in the first, third and fifth years after graduation.

Outcomes in terms of participation in further study for these graduates were the same as for others. They were just as likely to be involved in education or training in the first, third or fifth years after graduation, and to be involved in specific form of further training after five years. After five years, they were very slightly less likely to have obtained postgraduate coursework (22 compared with 25 per cent) and to have an undergraduate degree as their highest level of attainment (72 compared with 68 per cent).

Table 13 presents key statistics on the work seeking rates of graduates from disadvantaged and non-disadvantaged backgrounds. Those in the disadvantaged group are just as likely to be seeking work in the year following graduation, but increasingly more likely to be seeking work in the third and fifth years.

Table 13 Work seeking by disadvantaged group

	Year one		Year three		Year five	
	No	Yes	No	Yes	No	Yes
Not disadvantaged	74	26	79	21	80	20
Disadvantaged	73	27	76	24	74	26

Table 14 presents statistics employment rates of graduates from disadvantaged and non-disadvantaged backgrounds. Differences in first-year-out are trivial. People from disadvantaged backgrounds are slightly less likely to be working full time in the third and fifth years, and slightly more likely to be in part-time work.

Table 14 Participation by disadvantaged group

	Year one			Year three			Year five		
	Not working	Working full time	Working part time	Not working	Working full time	Working part time	Not working	Working full time	Working part time
Not disadvantaged	16	60	24	11	70	18	9	75	16
Dis-advantaged	18	58	23	12	65	23	11	70	19

In terms of the characteristics of their occupations, however, people in the disadvantaged background group tended to report slightly lower levels of participation in occupations classified as professional or managerial after five years (59 compared with 64 per cent). This may be confounded to some extent by the fields in which graduates studied. Their median annual salary was on par with

others and even slightly higher ($40,000 compared with $38,000) in the first year after graduation. Work satisfaction was also higher in the first year (61 compared with 58 on the 100-point scale), although this difference faded over time.

In summary, analysis of the 2008 GPS data suggests that people who entered university from disadvantaged backgrounds and were retained through to graduation reported educational and occupational outcomes equal to their relatively less disadvantaged contemporaries. From the evidence provided through the GPS, it appears that university education has helped ameliorate the differences seen in socioeconomic disadvantage on entry into the system. This is a nationally important finding. Clearly, then, the primary challenge resides in improving the access and participation of students from such backgrounds.

Key finding 18: People who entered university from disadvantaged backgrounds and were retained through to graduation reported educational and occupational outcomes equal to their relatively less disadvantaged contemporaries. It appears that university education helps ameliorate the differences seen in socioeconomic disadvantage on entry into the system.

Destinations of regional graduates

The GPQ asked graduates provides unique information about the areas in which graduates attended primary school and essentially spent their formative years. This information allows for additional insight not often found in surveys and administrative data sets. The analysis below has been undertaken looking at three main groups of graduates, those who grew up in metropolitan areas, those who grew up in provincial and small cities (that is, cities with fewer than 100,000 residents) and those who grew up in remote areas of Australia. Location was identified using the codes prepared for MCEETYA (Jones, 2004).

It is important to note in this analysis that the numbers of graduates from remote areas is relatively small and therefore the estimates in the following discussion are subject to (unknown) biases arising from measurement and sampling error.

The types of universities attended by students from these three different areas of Australia differ somewhat, according to the GPQ responses. Graduates from provincial and remote areas were much more likely to have attended a regional university than those who grew up in a metropolitan area.

By the time these people are in their fifth year following graduation from a university degree, the majority of those who grew up in a remote area of the country are living in one of Australia's state or territory capital cities. As would be expected, most of those who were from metropolitan areas were also living in capital cities. However, among those who grew up in regional towns, less than half were living in a capital city by the fifth year after graduation.

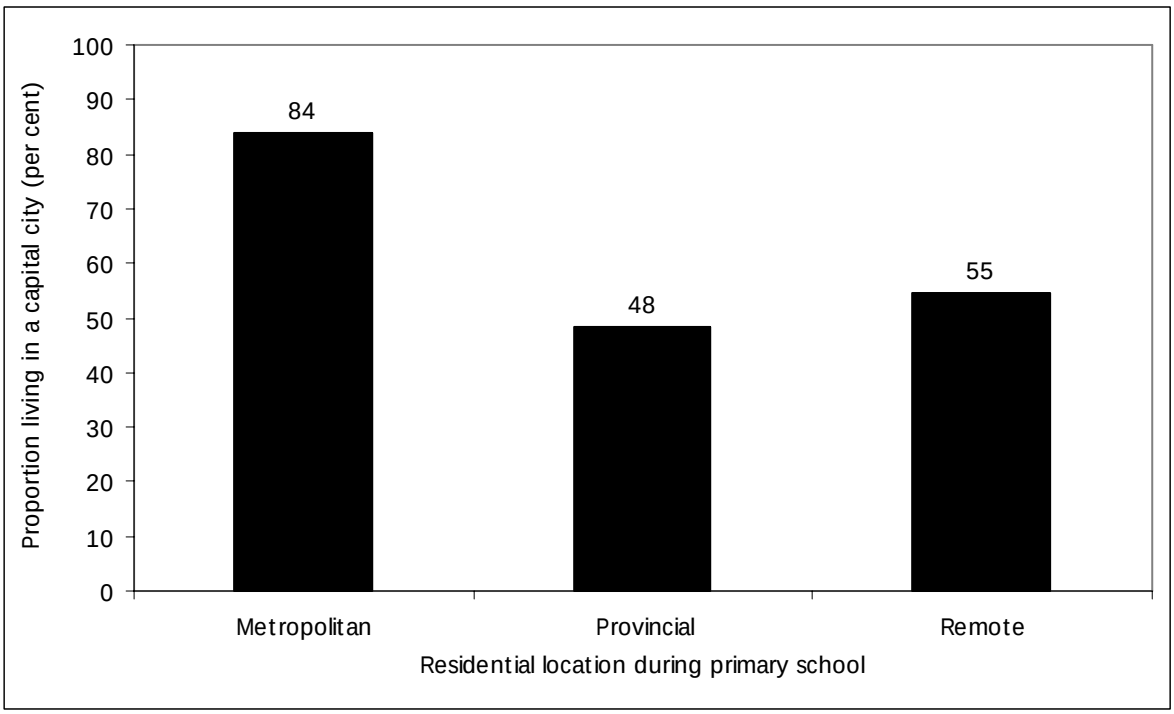

Figure 44 Capital city residence by primary school locality (year five)

In terms of graduates entry and participation in the labour force in the five years following completion, the figures from the GPQ suggest that there are different experiences depending on the type of area that the graduates grew up in. Figure 45 shows that in the first year after university, graduates from remote areas had a lower rate of participation in the labour force than those from metropolitan and provincial areas. However, this situation improved substantially for the graduates who grew up in remote areas by the third and fifth year after completion of their Bachelor Degree. By the fifth year out of university there was little difference in the labour force participation of graduates when differentiated by this variable.

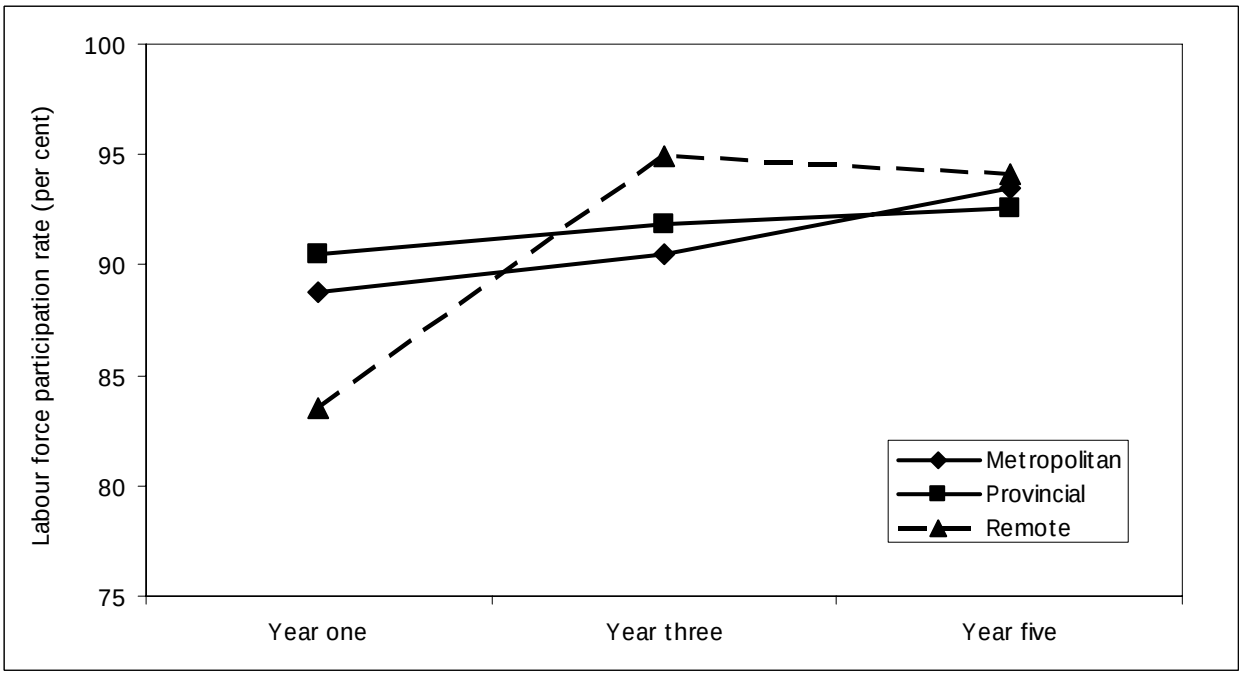

Figure 45 Labour force participation by primary school locality

As shown in Figure 46, the unemployment rate of graduates from remote areas begins at a higher level than those from other areas in the first year out of university, but as with the participation rates, is much more comparable to the other areas by the third and fifth year following graduation. Overall, those graduates who grew up in metropolitan areas tended to have slightly lower unemployment rates in the first year out of university, but were relatively similar to those from provincial and remote areas in the following years.

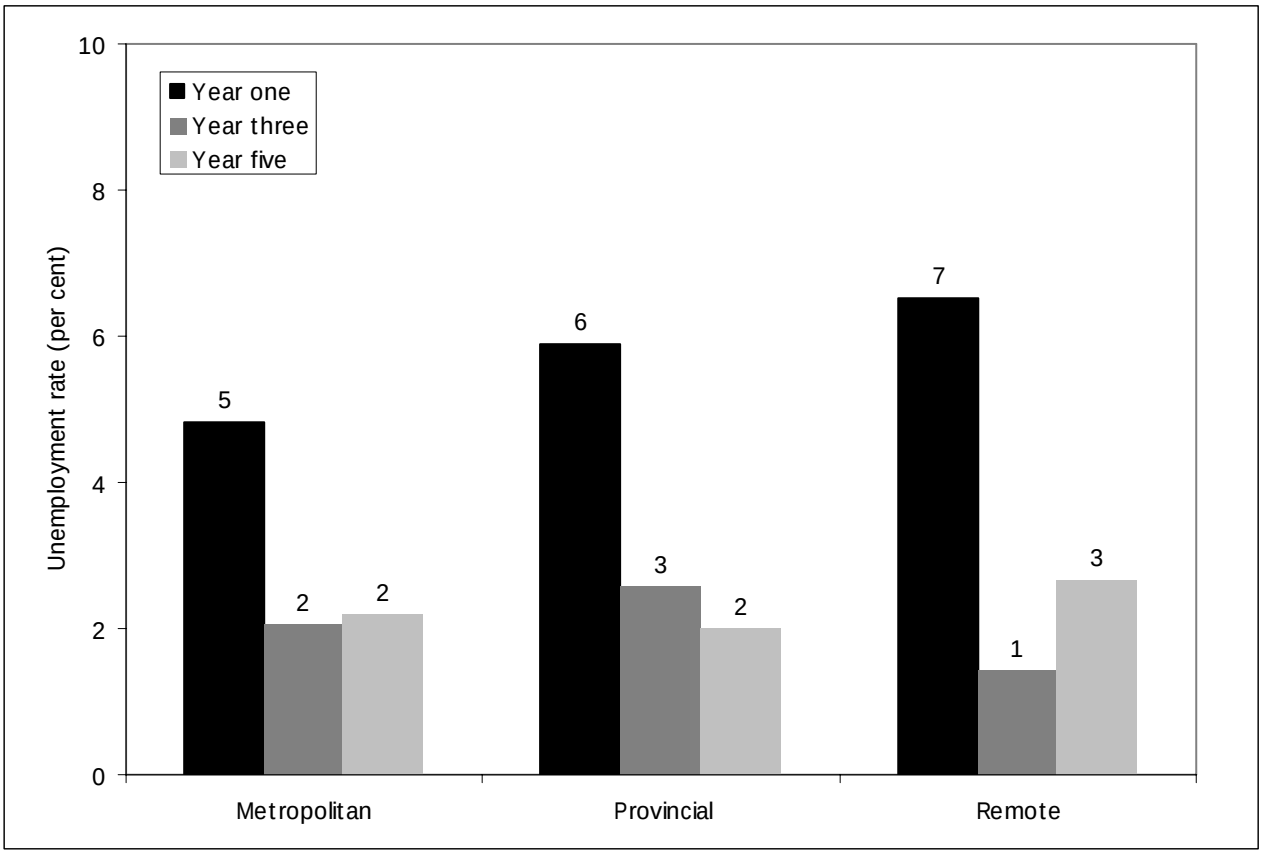

Figure 46 Unemployment rates by primary school locality

In terms of salaries for graduates who grew up in each of these areas and were working in a full-time capacity at one, three and five years following the completion of their bachelor degree, there appears to be an interesting pattern. Figure 47 indicates that in the first and third year after graduation there was no difference in the average full-time salaries when examined by location where the graduate grew up. However, by the fifth year, those raised in a metropolitan ($64,500) area had a slight advantage over those who grew up in provincial cities in regional Australia ($61,000) and those from remote areas ($60,000). The differences here aren't substantial, but it is interesting that they begin to exist at this later stage after no apparent differences earlier in their careers.

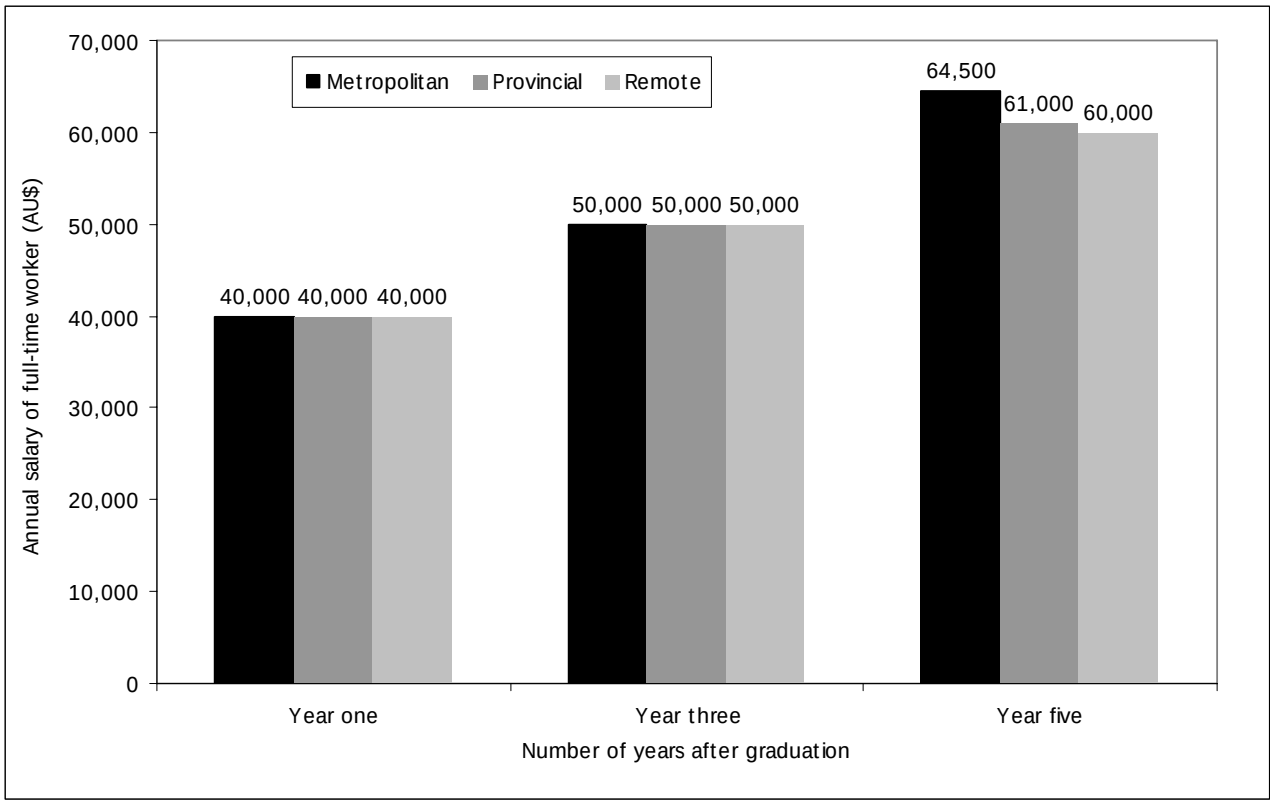

Figure 47 Median full-time annual salary by primary school locality

Key finding 19: Graduates who grew up in regional and remote areas are a key equity group. Five years after completion of their degrees, nearly half these graduates are living in Australian capital cities. GPQ responses show that the labour force participation and unemployment rates of these graduates improve in the five years after university graduation. However, salaries by the fifth year are slightly lower for this group in comparison to graduates who grew up in metropolitan areas.

Graduates who participated in paid work during study

Paid-work during study is a frequently discussed aspect of contemporary university education in Australia. It is contended on one hand that such activity is distraction from study, keeps internal students away from campus, and suggests that people do not have sufficient income to concentrate on being full-time students. On the other hand, however, paid work is seen to confer a range of benefits, including skill development, social opportunities, and income that supports an independent lifestyle. Increasingly, institutions are introducing various forms of work-integrated learning such as service learning and internships into formal curricula.

The GPS provides an opportunity to examine the influence of undertaking paid work during undergraduate study on graduates' perceptions of their degree, and on their vocational and educational outcomes. To examine this matter, an analysis was conducted on graduates who completed their bachelor degree as full-time and internal students, and who entered university as a school leaver and hence completed under the age of 25. This analysis explored which graduates are working most, and the apparent impact of such work on academic and professional outcomes.

Nationally, most 2002 bachelor degree graduates worked during their study for pay – a total of 83.2 per cent. After trimming the top one per cent of responses, the average number of hours worked per week was 13.1. The number of hours per week varied from under ten at three institutions to over 17 at two institutions. Graduates from Go8 institutions worked least hours (11.8 hours), compared with those at metropolitan institutions (15.4 hours). By field of education, engineering graduates worked

the least each week (10.0 hours), while architecture graduates worked the highest number of average hours per week (15.3).

In terms of demographics, females tended to work more than males (13.8 compared with 11.9 hours), as did Australian citizens (13.2 hours) compared with others (8.9 hours) and graduates with an English-speaking background (13.4 compared with 9.4 hours). Graduates from metropolitan areas worked more than those from provincial or remote areas (13.7, 11.9 and 8.8 hours respectively). People who completed primary school in a low socioeconomic area tended to work slightly less than others – 12.7 hours per week compared with 13.3 for others. Graduates whose fathers work in professional or managerial occupations worked for pay around the same number of hours per week than others – 12.8 compared with 13.7 hours. There were no differences according to maternal occupation status. Graduates who were the first in their family to attend higher education reported slightly higher number of hours worked for pay each week than others – 13.7 compared with 12.5 hours.

In summary, therefore, it appears that institution, field of education, childhood location, language background and sex account the most for the extent to which full-time and internal graduates who completed their degree under 25 years of age are involved in paid-work during their study.

What then is the impact of paid work on graduates' perceptions of their bachelor degree study? There was no relationship between paid work and average overall grade. The achievement of general learning outcomes, however, was lower for those students working more than 31 hours or more per week – a score of 56 compared with 62 for those working up to 30 hours. By contrast, developmental outcomes were enhanced through paid work – an increase from 42 to 46 on the 100-point scale. Satisfaction with study declined from 65 to 55 on the 100-point scale with increases in graduates' work from 1 to 40 hours per week. The mean satisfaction score for those not working was 62 – the same as those working between 11 and 20 hours. Working for pay during the bachelor degree was associated with perceptions that the degree was less relevant for further university study. By contrast, working for pay helped link the bachelor-level study with subsequent vocational education and training. Interestingly, undergraduate paid work was seen to become increasingly relevant to graduate employment in the first, third and fifth years beyond graduation.

Working for pay as an undergraduate has an interesting relationship between participation in further education. In the year just following graduation, paid undergraduate work was only related to participation in a postgraduate degree, certificate or diploma. After five years, however, the hours spent participating in paid work were positively associated with participation in short training courses and vocational certificates or diplomas, and negatively related to participation in undergraduate or postgraduate study. At the five-year mark, those who worked for pay are slightly more likely to have an undergraduate degree as their highest qualification, are more likely to have a postgraduate coursework qualification, but if working more than 10 hours a week are less likely to have a postgraduate research qualification.

Figure 48 shows that working for pay during study is positively related to employment after graduation. Importantly, it appears to be a springboard into full-time work. In the first year, while 49 per cent of those who did not work for pay as an undergraduate were in full-time graduate employment, this increases to 67 per cent for those who worked 21 to 30 hours and 78 per cent for those who worked 31 hours or more. Participation in part-time work increased from 13 then decreased to 26 to 15 per cent for the same groups. These patterns were repeated at the five-year point, although the rates of full-time work are higher and part-time work lower.

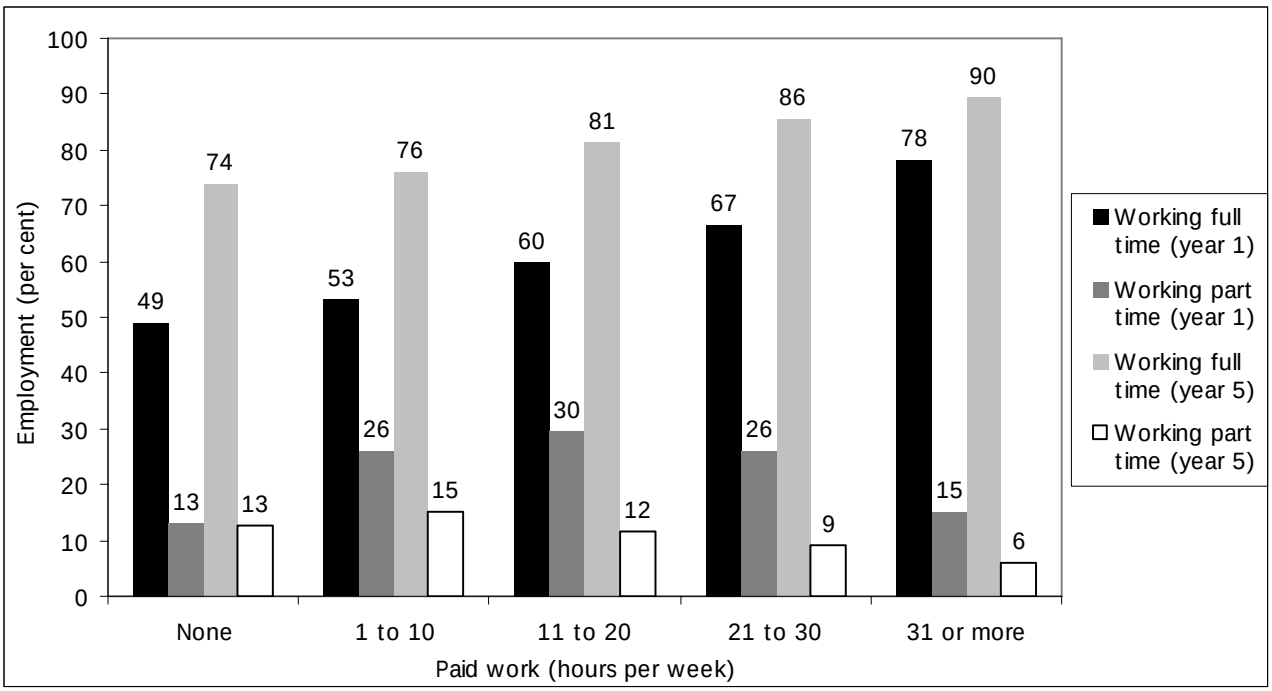

Figure 48 Graduate employment by undergraduate paid work

There was also a direct relationship between the amount of paid work undertaken during studies and likelihood of a graduate to be on a permanent contract. Figure 49 shows that among those employed five years after their bachelor completion, 87 per cent of those who worked 30 hours or more during their degree were in a permanent position, while the comparable figure for those who did not work during their degree was 70 per cent.

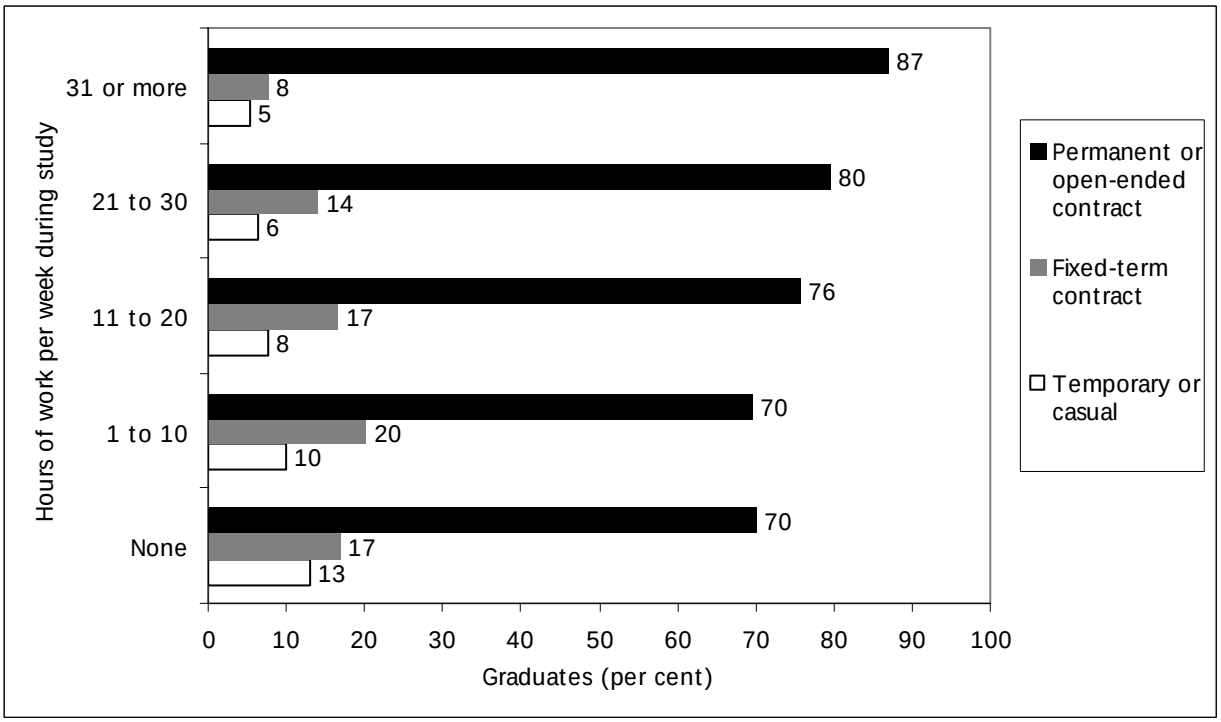

Figure 49 Contract type and length (year five) by paid work during study

After five years, graduates who worked between 1 and 10 hours per week as undergraduates are more likely to have professional/managerial occupations than those who did not work (71 compared

with 62 per cent). Figure 50 shows that they are also likely to have higher salaries, and that the relationship between paid-work hours per week and salary grows over time.

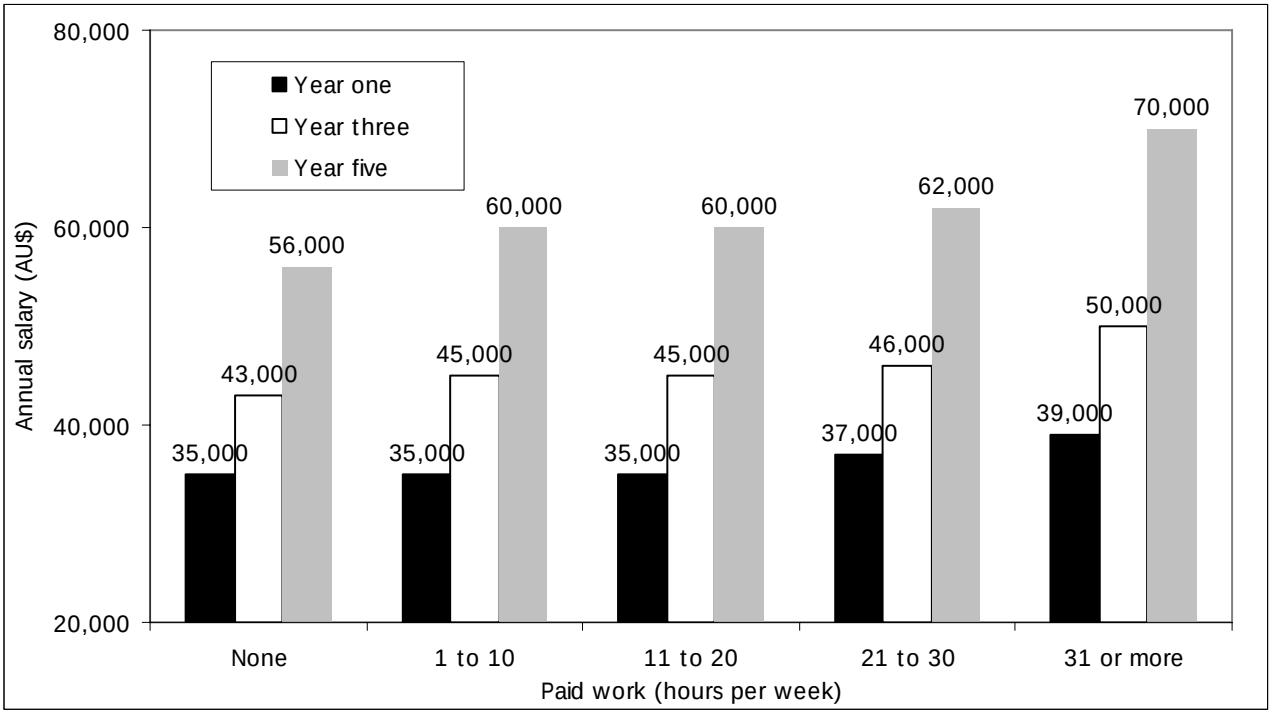

Figure 50 Graduate salary by undergraduate paid work

Results from the GPS 2008 suggest, broadly, that paid work during undergraduate study appears to have a reasonably positive influence on graduates' vocational and educational outcomes. The evidence does not suggest that people are participating in such work as students due to measured disadvantage. It also appears to confer a range of developmental outcomes which, judging by various employment and further learning interactions, may make bachelor-degree graduates more ready for the world of work.

Key finding 20: Paid work during undergraduate study appears to have a reasonably positive influence on graduates' vocational and educational outcomes. While people do not appear to be participating in such work due to measured disadvantage, they do appear to be developing knowledge and skills which makes them more ready for the world of work.

Outcomes for selected disciplines

Science and engineering career paths

Engineering and science graduates are a group of graduates which have been subject to increasing scrutiny over the past few years – mainly due to labour shortages in the engineering fields and the Australian drive towards a knowledge-based economy, highly reliant on scientific innovation. Often these two fields of education are grouped together in studies and analyses of labour demand, a notable example of this is the 2006 Science, Technology, Engineering and Mathematics (STEM) Audit (Department of Education Science and Training, 2006).

This analysis investigated the study and labour force participation as well as the industries of employment of these two groups of graduates. The analysis illustrates how these fields differ from the overall averages across all the fields of education, but more importantly, it shows that there are substantial differences between these two fields. Among other things, this suggests that future

analyses which aggregate these two categories are likely to miss the notable differences between them.

The most important difference between these two groups seems to be the fact that one, engineering, is a very vocationally oriented field, while science is more generic in nature. Another important difference between the two fields is the gender balance of graduates. Figure 51 shows that the female representation in science (58 per cent) is close to the average for all graduates. However, the female representation in engineering (16 per cent) is substantially lower than the average. Such gender differences are not unique to Australia. Similar findings were highlighted in the European REFLEX project (Allen & van der Velden, 2008). These differences help to explain a number of the outcomes shown in the analyses below.

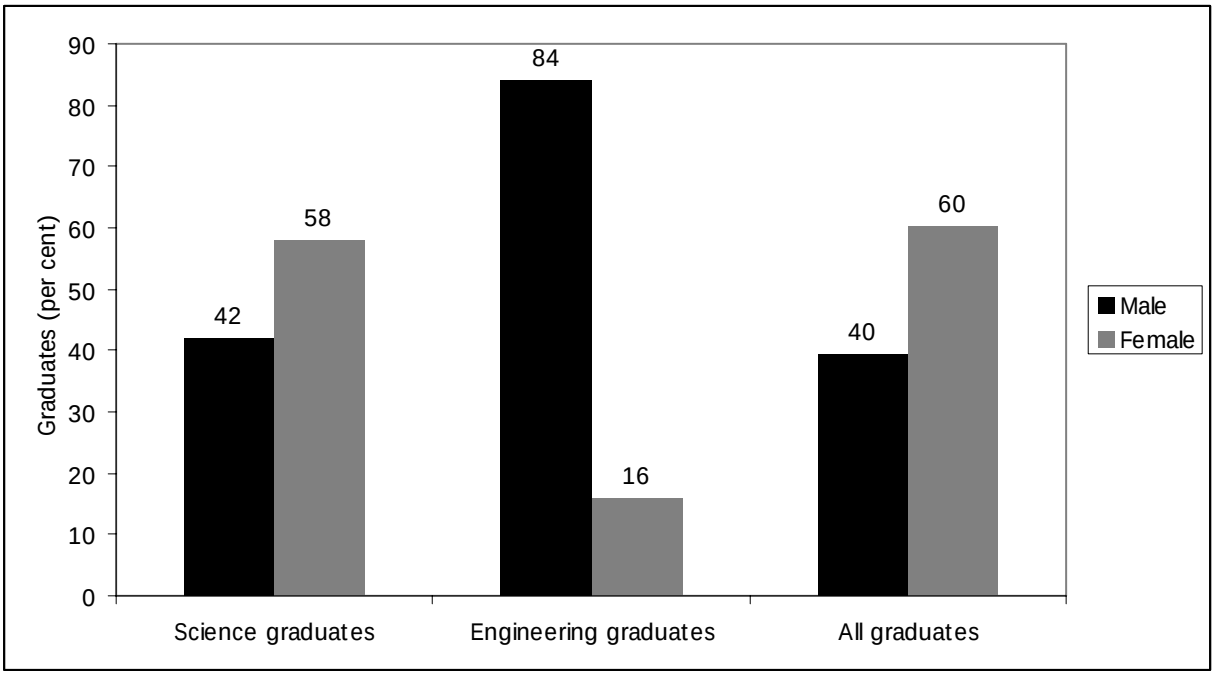

Figure 51 Sex by selected field of education

Possibly the most noteworthy difference apparent from the GPQ respondents between the science graduates, those from engineering and all fields is the rate of engagement in further study on completion of a bachelor degree. According to the GPQ responses, 60 per cent of science graduates were enrolled in some form of further study in the year after completing their bachelor degree. This is a much higher proportion than the overall average of 41 per cent. Engineering graduates on the other hand, had a lower further study enrolment rate than the average in the first year after graduation – just 34 per cent.

Figure 52 illustrates the size of the gap between take up of further study among science, engineering and all fields of education in the first year. Interestingly, by the fifth year after graduation, the rate of engagement in study among science and engineering graduates is almost identical. This is because the rate of enrolment in study among engineering graduates rises over the five year period, while the rate of science graduates in study declines.

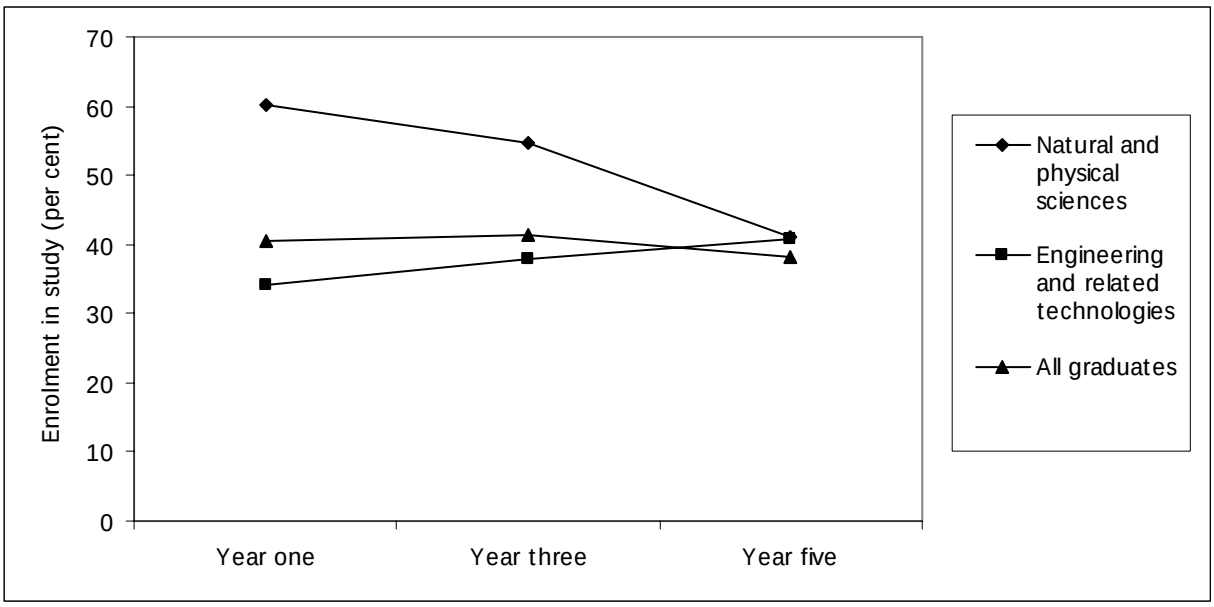

Figure 52 Participation in further learning by selected field of education

The type of education enrolled in does differ between these groups of graduates. In the fifth year after graduation, even though there is a similar rate of engagement in study, the vast majority of science graduates are enrolled in postgraduate courses (classified as postgraduate degrees, certificates or diplomas), while among engineering graduates the rate of enrolment in postgraduate study is similar to the rate of engagement in short courses. In the GPQ postgraduate study includes postgraduate degrees, certificates and diplomas. Respondents who are classified as involved in short courses are those who indicated that they were undertaking a 'short training course'. See the GPQ survey instrument in the attachments to this report for further insight into this.

Postgraduate study in particular is an important up-skilling mechanism for bachelor degree graduates. It appears that the relevance of such qualifications may be viewed differently by science graduates in comparison with their engineering peers. As shown in Figure 53, at the one, three and five year time periods, Science graduates who are in study are much more likely to be enrolled in a postgraduate qualification than those from engineering fields. In this regard Engineering graduates have a lower take-up rate of postgraduate study than the average across all fields.

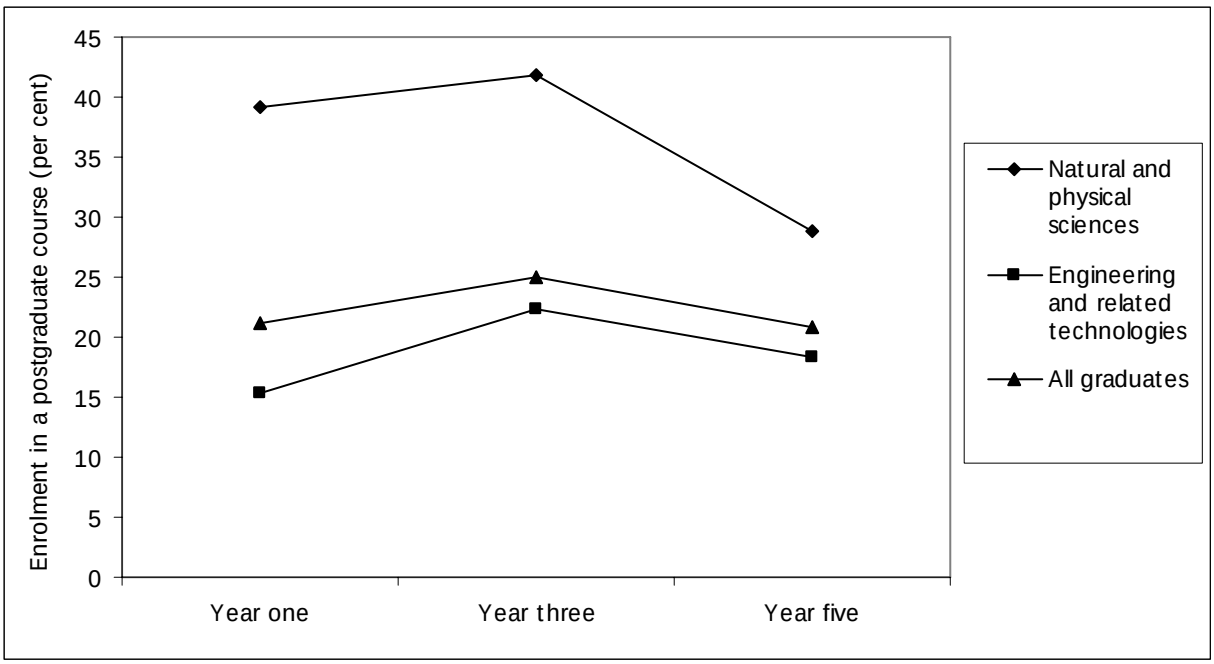

Figure 53 Participation in postgraduate study by selected field of education

There are also noticeable differences in the labour force participation rates between graduates from the engineering and science fields. These results are likely to be linked with the different patterns of educational engagement among these two groups.

The labour force participation rates of science and engineering graduates at one, three and five years after graduation show noticeably different patterns (see Figure 54). For engineering graduates, labour force participation is high (83%) in the year following graduation, and rises to a remarkable 96 per cent by the fifth year after graduation. For science graduates, the initial participation rate is comparatively low (67%) compared with the engineering and the average rate (84%). This rate rises steadily over the subsequent years to 85 per cent – close to the average rate, although still behind the rate among engineering graduates.

As noted earlier, this outcome is linked to the nature of these types of courses – the vocational nature of engineering degrees seem to help set a more definite career path than a science degree, which generally includes slightly more generic subject matter and often requires students to engage in further study in order to specialise. This can help explain the higher further study rates of the science graduates.

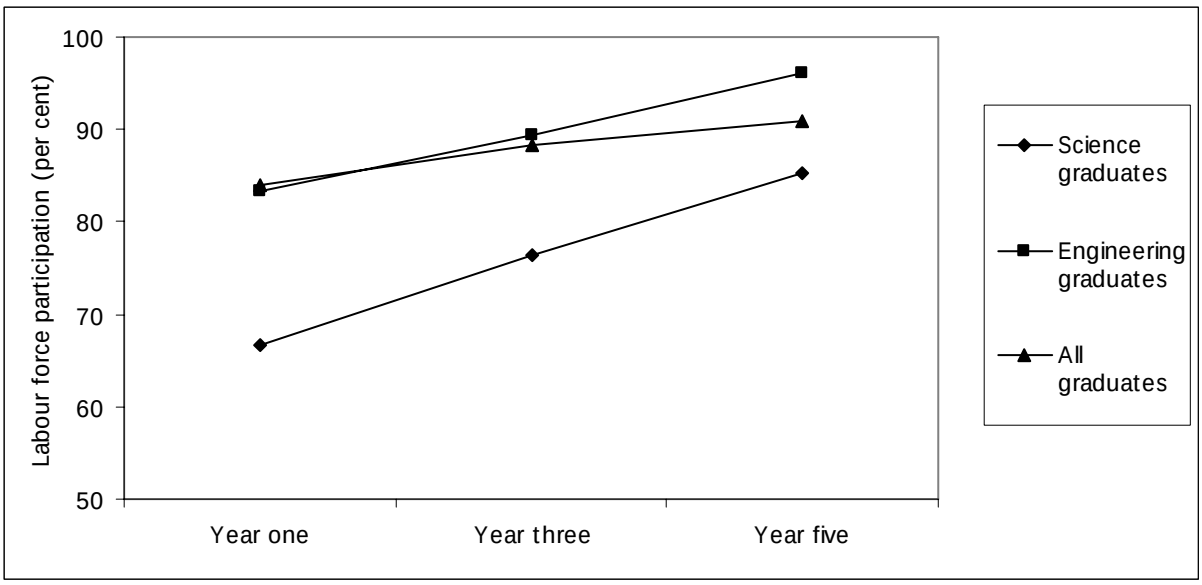

Figure 54 Labour force participation rate by selected fields of education

By the fifth year after graduation, there are clear patterns of employment destinations emerging among the graduates from different fields of education. The figures below again highlight the differences between the graduate destinations of science and engineering graduates.

For science graduates, 70 per cent of those in work were employed in either education, health or government. By contrast, the largest industries of employment among engineering graduates are property and business services, manufacturing, and mining.

Table 15 Work industry by selected fields of education, five years after graduation

	Science graduates	Engineering graduates	All Graduates
Education	34.1	7.1	24.2
Health and Community Services	24.0	2.9	23.8
Property and Business Services	4.2	27.4	10.6
Government Administration and Defence	10.8	9.3	10.3
Finance and Insurance	2.1	2.0	9.0
Manufacturing	7.3	14.3	5.2
Cultural and Recreational Services	0.9	0.2	2.6
Retail Trade	2.3	2.6	2.6
Construction	0.7	8.4	2.6
Mining	6.5	9.6	2.0
Personal and Other Services	1.8	2.7	1.8
Transport and Storage	1.2	4.1	1.3
Electricity, Gas and Water Supply	0.7	6.6	1.0
Agriculture, Forestry and Fishing	2.6	0.0	1.0
Accommodation, Cafes and Restaurants	0.5	0.0	0.9
Communication Services	0.3	1.4	0.7
Wholesale Trade	0.1	1.5	0.3

Between the first and fifth year after graduation, there were a couple of interesting patterns notable among the science graduates in particular. Of interest from a perspective of matching skills with jobs, the proportion of science graduates employed in the retail industry fell from 13 per cent in the first year to 2 per cent in the fifth year. In addition the proportion employed in accommodation, cafes and restaurants fell from 5 per cent to less than 1 per cent between first and fifth years after graduation. These figures suggest an increasing relevance between employment and graduate skills

among the science graduates. The figures in these industries among engineering graduates also declined, however, they were not at such high rates in the first year after graduation.

These outcomes show that extending graduate pathway analysis to five years out of university (rather than restricting it to analysis of activity after the first four to six months) can substantially enrich the understanding of graduate pathways. This analysis has shown how engineering and science graduates follow very different study and employment pathways over the five years following graduation. It has illustrated that while science graduates are much less likely to be in the labour force and much more likely to be studying in the first year after graduation, this situation changes substantially in the following years. The analysis has also shown the high participation and low unemployment rates of engineering graduates by the fifth year after graduation – highlighting the extreme demand for graduates with these qualifications.

Key finding 21: Engineering and science graduates follow very different study and employment pathways over the five years following graduation. While science graduates are much less likely to be in the labour force and much more likely to be studying in the first year after graduation, this situation changes substantially in the following years. Engineering graduates have high labour force participation and low unemployment rates by the fifth year after graduation – highlighting the extreme demand for graduates with these qualifications.

Destinations of education and nursing graduates

Teaching and nursing are two professions that have been in high demand and have commanded much attention from government and the media over the past decade due to projected shortages in numbers. The responses to the GPQ by graduates from these two fields can provide interesting insight into the early career pathways of those who are trained for these professions. In this analysis of education graduates, only those who completed a Teacher Education (ASCED narrow field of education code 0701) bachelor degree are included. The focus for this report was the outcomes and pathways of bachelor degree graduates and for this reason, the analysis does not investigate the outcomes relating to the alternative pathway to a teaching qualification - a graduate diploma of education. Those included in the nursing analysis completed a Nursing (ASCED narrow field of education code 0603) degree.

Both nursing and education are fields dominated by women. Among GPS respondents, 89 per cent of nursing graduates, and 80 per cent of education graduates were women.

This factor may be an influence on the labour force participation patterns of these two groups. As Figure 55 shows, the participation rates in the labour force among these two groups is particularly high in the first year after university, but declines steadily over the subsequent years. For education graduates, the rate of labour force participation goes from well above the average across all graduates in the first year out of university, to below the average level by the fifth year. Nursing graduates labour force participation does stay above the average by the fifth year, but the decline in participation is notable.

The links between labour force participation and sex are explored in another section of this chapter, but it appears that the high proportions of women in these two fields is a key driver of the outcomes shown in Figure 55. This is due to the fact that many aged in their mid- to late-twenties are considering, or have started to have, children and take on a caring role which can lead to lower work participation. Such patterns are not as apparent for men at these ages.

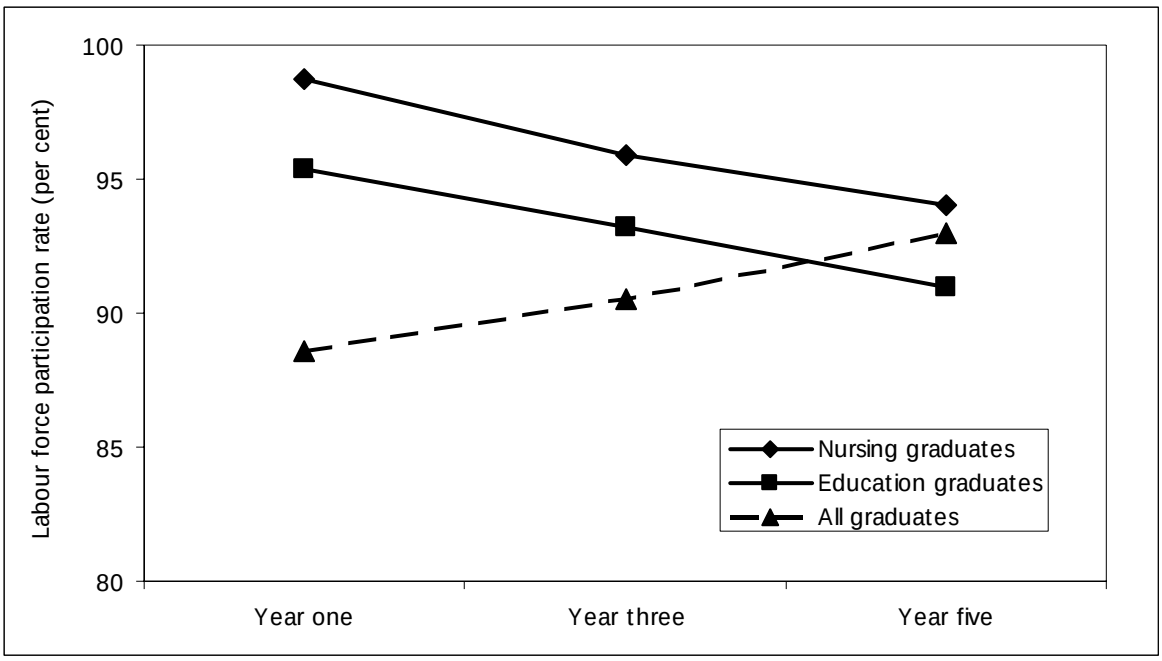

Figure 55 Labour force participation rates by selected fields of education

The high labour force participation rates for nursing graduates are supplemented by very low unemployment rates – see Figure 56. These two measures combined help contribute to the case that this is an area of employment with very high demand. The unemployment rates of education graduates are also low in comparison to the average rates for all graduates.

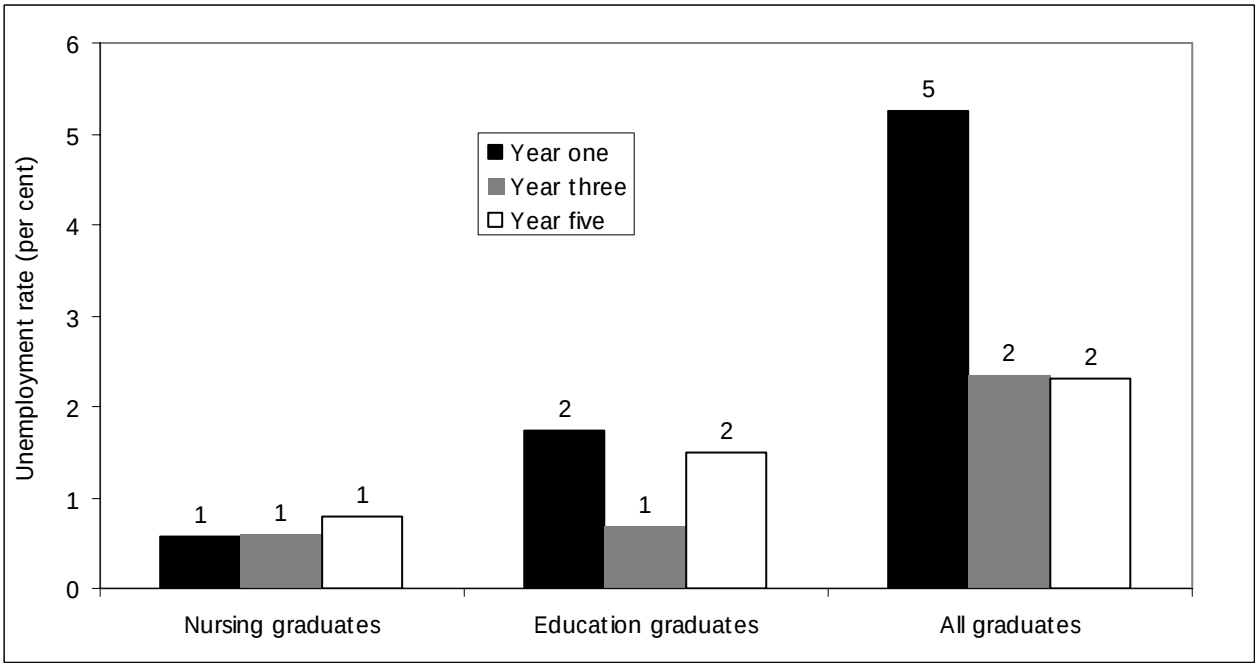

Figure 56 Unemployment rates by selected fields of education

Both education and nursing degrees are strongly vocational in emphasis. Therefore, it is important to see that a very large proportion of each of these groups enter employment within the industry for which they are trained. Table 16 shows that a very high proportion of nursing graduates who are employed work in the health industry. Employed education graduates also have a very strong skill/industry match, with the vast majority employed in the education industry. The education industry includes pre-school and school teachers, university staff, vocational and educational

training staff and employees of private education providers as well as those that provide support services which assist in the provision of education.

Among both education and nursing graduates, there is a slight decline in the prevalence to be employed in the industry relevant to training over the five years after university completion, but this decline is very small. Overall the figures indicate a very high proportion of these graduates who find employment are working in an industry directly relevant to the broad field in which they trained.

Table 16 Industry/field match for employed nursing and education graduates

	Nursing graduates in health industry	Education graduates in education industry
Year one	98	87
Year three	98	89
Year five	96	85

Figure 57 shows that one area in which there is some difference in nursing and education graduates career trajectories is in terms of engagement in full-time work over the five years following graduation. The pattern for nursing graduates is a decline among those employed to be in full-time work over this period, while the pattern for education graduates follows the overall trend for all graduates. It is possible that this outcome could be due to the fact that nursing work can be slightly more flexible in terms of hours than teaching work, although there are likely to be other substantial factors also influencing this outcome.

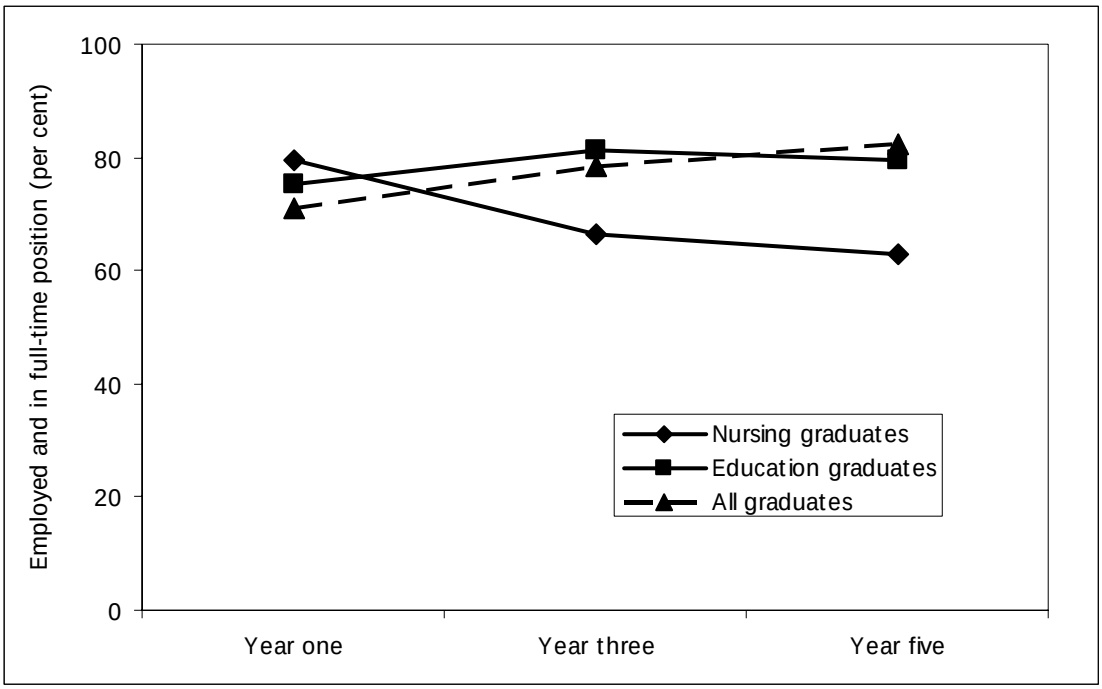

Figure 57 Graduates working full time

The median salaries obtained by employed graduates who are from these fields also reveal an interesting pattern. In order to make the figures comparable, only those in full-time work have been included in this analysis. As Figure 58 shows, education and nursing graduates fare well in income levels in the first year after university, both fields have median full-time salaries at higher levels than the median for all graduates. By three years out of university, there is equilibrium in median salaries of nursing, education and all graduates. However, five years after graduation, both nursing and education graduates have fallen behind the median salary for all graduates.

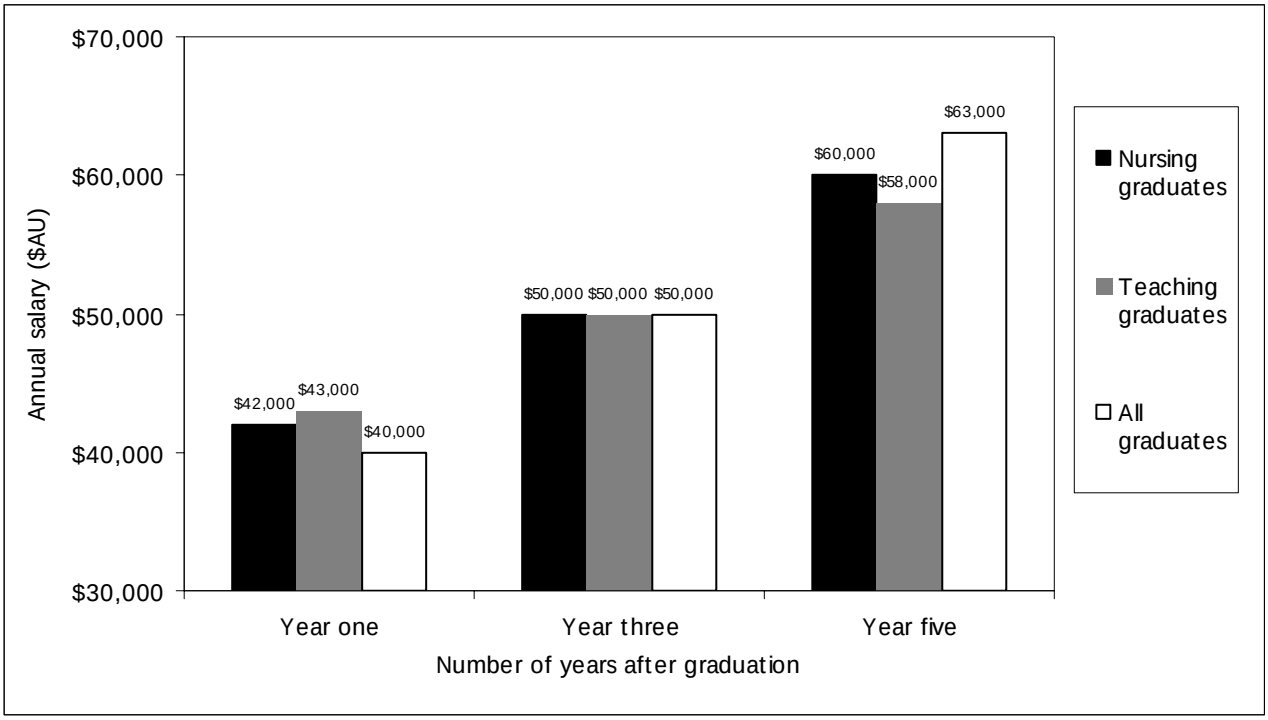

Figure 58 Median salary of those employed full-time by selected field of education

Key finding 22: Teaching and nursing are two professions that are in high demand and have commanded much attention from policy-makers in recent times. Importantly, graduates from these vocationally-based courses have a very high propensity to be employed in the industry most closely related to their studies (i.e. education or health). These graduates have very low unemployment rates at one, three and five years following graduation. Salaries for these two groups are above the median for graduates in their first year after completion, but fall behind the median by the fifth year.

Peter, who is very satisfied in his current job as a business development manager at a law firm, found that while his occupation is strongly related to the bachelor degree he completed, his university studies prepared him very little for the type of work he does. He completed a degree in commerce to improve his job prospects and majored in marketing and advertising as he found these were the most enjoyable areas. Since finishing his bachelor degree he has also completed a masters degree. While satisfied with the overall educational experience during his bachelor degree, he felt that his studies contributed only very little to his ability to write clearly and effectively and solve complex, real-world problems. He believes that greater importance should be placed on improving bachelor degree education in writing skills and problem solving, and that there should be a greater focus on developing capabilities needed for professional success and using real-life case studies and real-world problems in learning and assessment.

7 CONCLUSIONS AND FUTURE NEEDS

> I believe that exams are not as a useful learning tool as assessments such as literature reviews, research reports and seminars which allow students to look at particular topics in depth… (34 year old female biological sciences graduate)

> The aspects that have been most relevant are the communication skills, primarily writing skills, as well as skills in critical reflection and analysis. Additionally, skills learnt regarding human resources and social sciences have been very relevant – sociology and psychology. (27 year old male social studies graduate)

> The practical experience was the most relevant. However the theory was essential to be able to practice. (26 year old female nursing graduate)

Introduction

By way of conclusion, this chapter highlights key policy issues identified in this research. It also proposes areas in which this extensive data collection could be advanced. It does not provide a full overview of the study or report, which is included in the Executive Summary.

Key findings for policy

A five year outlook on graduate pathways is important

The GPS findings have identified key issues related to growth, mobility and improvements in the outcomes of graduates as they begin the early stages of their careers. This provides a significant improvement on current data collections of graduate outcomes in Australia. This new insight reveals for example, that there is substantial growth in work participation and salary levels among graduates over the first five years after degree completion. In addition, the ability to map change over time revealed that while education graduates, for example, fare very well in terms of salary in their first year out of university, their salary growth from then on is much smaller than for graduates from other fields of education.

New insights on university and employment linkages

The GPS has shown that over a five year period graduates from key skills shortage areas such as engineering, education and nursing maintain high labour force participation rates and the vast majority are employed in occupations directly relevant to their degree qualifications. In addition, the majority of graduates are working in professional and managerial occupations – Australia's fastest growing occupational classifications. Such a finding, when analysed over a five year period, indicates that the provision of university places for highly skilled positions and specific high demand areas does result in creating graduates who go on to fill skill-gaps. Further analysis of other or more specific areas of skill shortages such as teachers could be undertaken using the data collected from this survey.

Evidence on the benefits of a bachelor degree

The GPS has revealed that bachelor graduates from Australian universities have increasingly good labour force participation rates, low unemployment, high work satisfaction, and salaries that increase substantially and are much higher than the average Australian salary. In addition, a large proportion of graduates are employed in high skilled professional or managerial occupations. These insights, supported by a range of results in this report, emphasise the importance of increasing the participation of Australians in bachelor degree education.

A further imperative for enhance social inclusion

The GPS results have revealed that by five years after university graduation, many of the social and cultural barriers to success such as low SES background, origins in regional and remote areas, Indigenous status and first generation university attendance are removed and significant differences between graduate outcomes on these measures largely disappear. Such an outcome is particularly important for policy considerations in relation lifting school completion rates among disadvantaged groups, and to university entry provisions (and the barriers to entry) for disadvantaged groups.

However, it must be noted that in terms of equity, gender equity seems to reverse in the years following university graduation. While a greater proportion of women than men gain entry to and complete university, by five years after graduation women have lower salaries and lower labour force participation rates. This is partially due to child rearing responsibilities that many women in these age groups take on at this time. However, analysis that takes these issues into account, along with differences in employment patterns, still reveals a wage differential between men and women that grows substantially in the five years following university.

Data on graduate skill development

Graduate respondents to the GPS indicated that their degrees helped them develop core skills only to a certain extent. A national average score of 61 out of 100 recorded by graduates in relation to their perceptions of development during their degree in competencies such as writing, speaking, thinking and analysing indicates that there may be improvement needed in such generic skills. Certainly, following consultation for this research, industry in Australia is very keen on graduates displaying high levels of such competencies. In addition, graduates assessment of their general development (contribution to the welfare of their community, industry awareness and understanding of social contexts) was also relatively low (an average of 45 out of 100). On the other hand, graduates indicated that the relevance of their degree to their employment improved over the five years following graduation, indicating that the value of a degree is ongoing, not simply a piece of paper used to gain entry to the labour market.

Information on higher education quality

The perceptions of Australian graduates as to the quality of Australian university degrees, measured some years after completion of study is an important indicator for universities and policy makers. The GPS results show that overall graduates were relatively satisfied with their courses. A national satisfaction score of 64 out of 100, which varied from 59 to 68 across fields of education, indicates that graduates certainly aren't dissatisfied with their study experiences.

In terms of identifying areas of improvement for the bachelor degree, graduates rated elements of the curricula that enhance the application of learning – such as using real life case studies and having teaching staff with work experience in their field – are the most important. Such findings can have widespread policy implications, especially given the parallel of this finding with the ideas relating to the benefit of applied learning expressed by employers.

Future research needs

The 2008 Graduate Pathways Survey has laid important foundations for further development. The findings presented in this report reflect an initial but important contribution to our understanding of university education, graduate careers and the professional workforce in Australia. Methodologically, the work undertaken in 2008 has been developmental and exploratory in nature. The insights in this report offer baseline but certainly not exhaustive data for monitoring policy and practice.

Further work in the following areas should be considered:

1. The Graduate Pathways Survey provides new and valuable information into the function, productivity and quality of university education in Australia. The collection provides insights on graduate supply that can greatly assist system- and institution-level monitoring and planning. To consolidate the GPS, it is suggested that the collection be replicated on an annual basis until 2010, with consideration then given to administering the collection on a bi-annual basis thereafter. Such replication would help validate and extend the data on which the current findings are based, further test and embed the methodologies into institutional practice, assist with system- and institution-level monitoring, and help universities further engage with their graduate communities.

2. Given their contribution to Australia's higher education system and the economy overall, consideration should be given to including international students in further work. This was beyond the scope of the current study. To deliver meaningful results, additional design and development would be required.

3. Australian universities have varied arrangements for maintaining ongoing contact with alumni, yet this research has affirmed the viability productivity of communication channels and alumni engagement. Considerable educational, social and economic value would derive from applied research and development work that helps institutions understand how to engage with their graduate community.

4. The design and develop of research instruments and data collections is timely and expensive. As noted throughout the report, the rich amount of data collected in the GPS cannot be comprehensively covered in the space of one research report. Given the scope and relevance of the collection, it is important that the data is further analysed in ways that elicit further findings and delve deeper into issues of particular policy relevance.

5. Given the 'global war for talent', there would be considerable value in preparing a comparative research report that examines international findings from similar studies, examines the extent to which comparison is worthy (by checking methodologies, instruments, items and population frames), and explores the extent to which Australian graduates fare on a number of composite measures.

6. The findings presented in this report suggest a large number of specific areas of interest are in need of additional sustained analytical attention. Further analysis should explore:

   - further examination of the definition and measurement of satisfaction, development, learning and capability
   - different means of conceptualising and modelling the match between graduates' jobs and skills, giving particular focus on areas with high labour market demand
   - further education pathways of graduates and their subsequent employment outcomes – especially among those who completed a higher degree in the five years following bachelor degree graduation, and
   - detailed examination of patterns linking perceptions of relevance of study to employment at one, three and five years after graduation with field of education, occupation and industry of employment.

7. Further analysis should also be conducted on the many experimental items included in the research instrument that have tested new ways of measuring social inclusion, educational quality and graduate outcomes. This work should explore how greater use can be made of

the socioeconomic indicators incorporated in the GPS to create composite measures of disadvantage and follow graduate pathways using such instruments. More general forms of psychometric analysis and validation should also be conducted.

Of course, the unique value of giving life to a new perspective as presented in this report is that the possibilities for future work and development are limited only by the imagination of the readers who reflect on and make use of the findings. Hence feedback from stakeholders on this report itself will provide useful insights into ways in which this new perspective on university education and graduate careers in Australia can be consolidated and advanced. While this will arise in informal ways, there would be value in developing structured means of managing and capturing the thinking that develops.

Susan has been working full time as a social worker since completing a bachelor degree in 2002 in social work and Aboriginal studies. She found that her degree contributed greatly to her ability to develop a personal code of values and ethics, understand different social contexts and contribute to the welfare of the community and sees herself continuing in the same type of work for the next few years. Susan is quite satisfied with the work she is doing and rates her employability as excellent.

Originally from country New South Wales, Susan's father was a farmer and her mother worked part-time as a bank teller and assisted with the sheep and cattle farm. She was the first in her family to attend university and did so in order to improve her prospects for employment and to further her career plans. Although she would complete the same bachelor degree if she could start over again, she indicates that she probably wouldn't attend the same university. In spite of this Susan has found that her degree study has been very beneficial to her paid work, especially the more practical aspects of the degree including work experience and interpersonal skill development.

Ali commenced her science degree right after school following recommendation from careers advisors that she should study a field of interest. She worked in paid jobs for 10 hours per week, which helped enhance her learning outcomes as well as more general forms of development. She was very happy with the university course overall, in particular that it allowed her to gain accreditation to work as an occupational therapist.

Ali secured employed right after completing her degree, working for 38 hours as an occupational therapist on an annual salary of $50,000. The fit between her study and work was good, and her work satisfaction high. She took a related role in the UK in 2005, three years after completing her degree. This role was temporary and paid slightly more ($60,000) for a few less hours per week. In 2008 she returned to Australia to her pervious employer and role, but this time on a salary of $70,000 and undertaking a short training course.

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APPENDIX A AUSTRALIAN COUNCIL FOR EDUCATIONAL RESEARCH

The 2008 Graduate Pathways Survey (GPS) was funded by the Australian Government Department of Education, Employment and Workplace Relations (DEEWR), and designed and managed by the Australian Council for Educational Research (ACER).

The Australian Council for Educational Research (ACER) is one of the world's leading educational research centres. Its mission is to create and promote research-based knowledge, products and services to improve learning across the lifespan.

ACER was established in 1930 and for more than 75 years has built a strong reputation as a provider of reliable support and expertise to education policy makers and professional practitioners. As a not-for-profit organisation, independent of government, ACER receives no direct financial support and generates its entire income through contracted research and development projects and through products and services that it develops and distributes. ACER has experienced significant growth in recent years and now has around 260 staff located in Melbourne, Sydney, Brisbane, Perth, Dubai and New Delhi.

ACER is a leader in the provision of quality educational research, both within Australia and internationally. As a national, independent research body, ACER brings a high level of expertise and objectivity to its work.

In recent times ACER has expanded on its program of research and development in support of learning in vocational education and training and in higher education institutions while maintaining and expanding work undertaken in support of schools.

Blending solid experience and creative talent with established methodologies, ACER is a full-service research consultancy specialising in collecting and interpreting information to shape strategic decision making. Researchers bring many years of experience and expertise in a range of disciplines and research methods to their projects. ACER has seven research programs.

Research into transitions and post-school education and training explores influences on the educational and occupational pathways of young people as they progress from school to further education, training and work. Studies investigate the labour market and social outcomes of different pathways as well as evaluations of particular policies and programs.

The assessment and reporting program conducts research into a wide range of educational outcomes (academic and social). This work, undertaken for clients nationally and internationally and in support of ACER's own tests and assessment programs, includes the refinement of test constructs; studies of test validity and reliability; assessment methods and formats; psychometric analyses of test data; and methods for item banking, online test delivery and reporting.

Research in the national and international surveys area draws on staff expertise in sampling, survey management, the analysis of survey data, and the interpretation and reporting of results in conducting large scale survey research. Current work includes the leadership of three major programs of international surveys including the OECD Programme for International Student Assessment, the IEA Civics and Citizenship Education Study, and the IEA Teacher Education Study.

The system-wide testing program identifies more effective ways of monitoring achievement across entire education systems.

Research into teaching, learning and leadership focuses on the cognitive, affective and behavioural processes and factors that affect learning, as well as the relationship between teacher professional development and improved student learning.

The policy analysis and program evaluation unit explores education policy issues and conducts program evaluation.

In addition to being a national centre for educational policy research and advice, ACER develops and provides a range of research-based products and services to support the work of professional practitioners.

ACER provides secure, fee-for-service testing programs to schools, universities, employers and professional organisations. These programs include selection tests for entry to schools and universities, scholarship tests and tests for diagnostic and monitoring purposes, and recruitment tests.

The organisation also encompasses ACER Press, the Cunningham Library, the Centre for Professional Learning, the International Institute, and the ACER Leadership Centre.

APPENDIX B PROJECT DEVELOPMENT AND APPROACH

Planning phase

A detailed planning and preparation phase was undertaken to align the work with relevant policies, practices and methods. Consideration was given to institutional, national and international contexts. This planning phase involved technical design, stakeholder consultation, and development of efficient and robust management processes.

Work at the start of the project focused on specifying project design and management in detail. During this stage, it was the project team's aim to confirm the:

- objectives of the project, the specific outcomes, areas of potential risk and the methodology
- methodology to achieve the project objectives, deliverables and outcomes within the required timeframe, and
- roles and responsibilities in relation to project management, including workflows, timelines and communication strategies.

ACER designed a methodology with a view to this providing a basis for future collections. Key aspects of the survey methodology were transferred from the Australasian Survey of Student Engagement (AUSSE) (Coates, 2008). The AUSSE has been designed as the most valid and effective means of managing devolved survey data collections in Australian higher education. The methodology was tested successfully with 25 institutions in 2007 and 29 institutions in 2008. It brings together insights arising from a decade developing national collections in Australian higher education, and in particular the 2005 review and redesign of the Australian Graduate Survey that was designed and managed by Hamish Coates (Coates, Tilbrook, Guthrie & Bryant, 2006).

Reviews and consultations

Background documentary research was undertaken in parallel with further targeted stakeholder consultation. Findings from this work informed instrument and system design. Instrument validation came through the research-based design process, building links with existing instruments, expert review, technical review, qualitative testing, pilot testing, psychometric testing, and development of efficient, appealing and operationally effective paper and internet form designs.

To enhance the project's policy impact the ACER team conducted a series of focused consultations with peak agencies and providers. While beyond the formal project brief, we felt that such consultations would play a formative role in shaping the focus, directions, legitimacy of the instrument and hence overall findings and outcomes of the work. These consultations also helped to legimitise and underpin the research, and to engage institutions in the study.

The researchers drew on networks and initiated contacts with school- and university-based careers advisors, student affairs and advising staff, graduate careers advisors (GCA, AAGE, NAGCAS), large graduate employers and related groups (such as Engineers Australia, CPA Australia, BCA, AAGE, AIG, ACCI). We liaised with and sought the endorsement of Universities Australia, as well as of the Group of Eight (Go8) and the Australian Technology Network of Universities (ATN).

Reviews of research and practice were conducted at this formative stage. For this, we utilised the services of ACER's specialist librarians and library resources to review empirical and policy studies published in the past 15 years in Australia and abroad. The search focused on graduate careers, graduate outcomes, and the alignment between university study and work.

A logo and visual identity for the data collection was created – see opposite. A website was also developed to provide information to a wide range of stakeholders, including potential respondents.

Engaging and supporting institutions

Engaging a sufficient number and range of institutions in this study was critical for its success. At the start of June a letter was sent to all Vice Chancellors informing them of the research focus and objectives. Letters and emails were circulated to other key contacts within the institution. These letters detailed the benefits of the study, and ask institutions to make an in-kind contribution of up to two days of a Project Officer's time to the study.

By mid July ACER was successful in securing the participation of all Table A and Table B higher education providers in the study.

A graduate population definition was designed to set parameters for all fieldwork, data preparation and statistical analyses. In broad terms, the target population consisted of graduates who completed requirements for a bachelor degree qualification in 2002 in a Table A or Table B higher education institution. The definition of 'bachelor degree' was incorporated from existing DEEWR aggregations and includes bachelor pass, honours and graduate entry degrees. The population was limited to domestic graduates.

Given the population under study and hence anticipated low response rates, it was proposed that a census rather than survey was the most effective collection approach for this study. An advantage of sending all individuals in that target population a questionnaire is that the target list is relatively simple to specify and the collection may be simpler to administer. Further, the census approach aligned with the collection approach used in the 2002 GDS. The census approach was adopted strategically, because while it is by far the most common means of collecting data in Australian higher education, it has disadvantages. In particular, it is expensive, involves collection of data that adds little value to the results, overburdens potential respondents and, without careful specification, can produce results with unknown levels of bias or precision.

Developing an operational definition of the census population was relatively simple using the DEEWR Higher Education Student Collection (DEEWR, 2008). Identifying the individuals in this population, however, was more complex. It was anticipated that there might be some difficulty in obtaining current postal or email addresses for the target population given that the most recent details for many in the cohort would be five years old. Most 2002 university email accounts based on the bachelor degree enrolment would have been closed and, in line with recommendations by Coates, Tilbrook, Guthrie and Bryant (2006), only a few institutions have recently started collecting personal email addresses.

It was necessary to use the individual contact details that are held by participating institutions. Given privacy laws and institutional regulations, it was not possible for these to be provided to a third-party organisation (although ACER did conduct the mail out for one large institution). Thus it was necessary to conduct a 'devolved but controlled' collection that involved participating institutions and used methodologies developed for the Australian Graduate Survey (Coates, Tilbrook, Guthrie and Bryant, 2006) and the Australasian Survey of Student Engagement (AUSSE) (ACER, 2008).

An administration manual was developed for university staff that provided guidance on managing their involvement in the study. This manual was designed and developed as an ongoing resource for use in future collections. As with the manuals developed for the Australian Graduate Survey

(Coates, Tilbrook, Guthrie and Bryant, 2006), the Australasian Survey of Student Engagement (AUSSE) and the Changing Academic Profession (CAP) surveys (Coates & Murphy, 2006), the manual provided a succinct overview of the study's focus and method, operational details on drawing the sample, and information on distributing emails and paper survey packages.

Graduate Pathways Questionnaire: design and validation

The ACER team designed, developed and validated the Graduate Pathways Questionnaire (GPQ) as a resource that could be used in future work. Development of a validated GPQ, as opposed to a document that contains a list of untested questions, was seen to be of considerable ongoing value to Australian higher education. A detailed codebook was developed to manage the instrument and subsequent data analyses.

The 2008 GPQ contained around 160 items. The instrument invited graduates to respond to questions under a number of headings. The headings were ordered to facilitate graduate's recollections and recall, offer an opportunity to reflect on individual experiences, enable efficient design and presentation, and minimise the analytical impact of response interference effects such as fatigue. The five sections were:

- Your 2002 bachelor degree(s)
- Your activity in April 2008
- Your activity in April 2005
- Your activity in April 2003, and
- About you.

To help build the kind of analytical linkages that facilitate higher-order forms of policy analysis, formative links were made between the GPQ and the following instruments:

- First Year Experience Questionnaire (FYEQ) (Krause, Hartley, James & McInnis, 2005)
- Course Experience Questionnaire (CEQ) (Ramsden, 1991; McInnis, Griffin, James & Coates, 2001; Griffin, Coates, James & McInnis, 2003)
- Graduate Destination Survey (GDS) (GCA, 2008; Coates, Tilbrook, Guthrie & Bryant, 2006)
- Student Engagement Questionnaire (SEQ) (Coates, 2006; ACER, 2008)
- AQTF 2007 Learner Questionnaire (LQ) (Coates & Hillman, 2008), and
- AQTF 2007 Employer Questionnaire (EQ) (Coates & Hillman, 2008).

A number of steps were taken to validate the GPQ instrument, items and scales so as to ensure that it provided measurement with required levels of precision. Validation came through a research-based design process, building links with existing instruments, expert review, technical review, qualitative testing, pilot testing at a single institution, psychometric testing, and efficient, appealing and operationally effective paper and internet form designs.

The GPQ was produced in both paper and online formats. The paper form (supplied as an attachment to this report) was professionally designed in two colours, optically scannable, and printed as four A4 pages on a landscape-folded A3 sheet. The online form was designed with a user-friendly look and feel, with functionality designed to enhance response quality and levels, and with advanced data management. A copy of the 2008 GPQ online form can be viewed at www.acer.edu.au/gps. Both paper and online instruments were designed for completion within 15 minutes.

While many of the GPQ items were designed to be analysed as presented to graduates, many were designed to be used to derive various discrete and composite variables (commonly referred to as 'scales'). The GPQ measures a series of individual and contextual input, process and outcome factors. It captures data that can help build understanding of how these factors shape bachelor degree graduates transitions and academic and employment outcomes in the first five years after graduation. Table 17 lists the main discrete and composite variables analysed in this report, which are explored briefly in the discussion that follows.

Table 17 Variables included in the analysis

Demographics	Educational contexts	Post-graduation activities
Sex	Study influences	Main activity
Age	University group	Education activity
Citizenship	Field of education	Work seeking activity
Main home language	Degree in preferred field	Work activity
Indigenous	Degree start date	Work industry
Disability	Attendance mode and type	Work country
Regionality	Hours in paid work during study	Occupation
Family disadvantage	Average overall grade	Work start date
Current disadvantage	General learning outcomes	Contract duration
Highest qualification	General development outcomes	Hours per week
Sibling education	Satisfaction with study	Annual salary
Parental education	Relevance of study	Work satisfaction
Parental occupation	Areas for improvement	Employment strategies

The GPQ measured a number of respondent characteristics including age, Indigenous status, language background and whether they had a disability. Based on the reported limitations of other metrics (Coates & Krause, 2005; James, Baldwin, Coates, Krause & McInnis, 2004; CSHE, 2008), the current study tested alternative means of assessing students' socioeconomic status and regional background. It is likely that disadvantage is more likely to be linked to where a student lived during their childhood rather than where they may happen to live while being admitted to or studying at university. Students were asked to report the locality and postcode in which they lived at the end of primary school. This information was coded using the education and occupation data from the Australian Bureau of Statistics Socioeconomic Index for Areas (SEIFA) (ABS, 2008). They were also asked to report the occupation and highest level of education of their parents. Information on whether siblings had attended university before the respondent was also captured, as it was hypothesised that this may influence an individual's preparedness to commit to university study.

As Table 17 shows a range of information was collected on educational contexts associated with the 2002 bachelor degree. While 2008 GPS results may prove informative for individual institutions, the data is not designed to be analysed at this level. However this report does consider results in terms of the type of university attended by a graduate. The grouping of universities used in the analysis is shown in Table 18.

Table 18 University groups

University group	University
Group of Eight (Go8)	University of Western Australia
	University of Adelaide
	University of New South Wales
	University of Queensland
	Australian National University
	Monash University
	University of Melbourne
	University of Sydney
Australian Technology Network of Universities (ATN)	Curtin University of Technology
	University of Technology, Sydney
	University of South Australia
	RMIT University
	Queensland University of Technology
Innovative Research Universities of Australia (IRU)	James Cook University
	Murdoch University
	University of Newcastle
	La Trobe University
	Flinders University
	Griffith University
Regional universities (Regional)	University of Wollongong
	University of Ballarat
	Central Queensland University
	University of Southern Queensland
	Charles Darwin University
	Charles Sturt University
	Southern Cross University
	University of New England
Metropolitan universities (Metropolitan)	Swinburne University of Technology
	Edith Cowan University
	University of Canberra
	Bond University
	University of Western Sydney
	Australian Catholic University
	Victoria University
	Macquarie University
	Deakin University
	University of the Sunshine Coast
	University of Notre Dame, Australia
	University of Tasmania

The outcomes of university education can be conceptualised and measured in many different ways. An indicator framework was developed for Australian higher education in the late 1980s (Linke, 1992) which has underpinned work at the national level since this time. Since this time, and based partly on the developments spawned by such frameworks as well as by their limitations, an increasing amount of emphasis has been given to better specifying and understanding graduates' learning and development outcomes (Coates, 2007a, 2007b, 2008).

Design of the GPS did not have as one of its tasks the consideration of possible outcomes measures. The study's scope and methodology also placed natural limits around what might be achieved. Development of the GPS did provide an opportunity to explore various definitions, however, and to do so from the new vantage point five years beyond degree completion. A range of outcomes were

specified, therefore, and new measures were developed to underpin these. Table 19 provides more information on the composition of key scales.

Table 19 Scales considered in the analysis

Scale	Items
General learning (α=0.77)	Acquiring job- or work-related knowledge and skills
	Writing clearly and effectively
	Speaking clearly and effectively
	Thinking critically and analytically
	Analysing quantitative problems
	Using computing and information technology
	Working effectively with others
	Learning effectively on your own
General development (α=0.82)	Understanding people of other racial and ethnic backgrounds
	Solving complex, real-world problems
	Developing a personal code of values and ethics
	Contributing to the welfare of your community
	Developing general industry awareness
	Understanding different social contexts
Satisfaction with study (α=0.77)	Overall, how would you evaluate the careers advice at your university?
	How would you evaluate your entire educational experience during your bachelor degree(s)?
	Overall, was your bachelor degree study worth the cost, time and effort?
	If you could start over again, would you go to the same university?
	If you could start over again, would you choose to do to same bachelor degree(s)?
Enhance learning contexts (α=0.65)	Enhance the convenience of study
	Develop more supportive learning environments
	Offer more enriching experiences and activities outside of class
	Introduce more fieldwork, placements and internships into coursework
	Have fewer lectures and more seminars, workshops and symposia
Enhance focus of education (α=0.50)	Focus more on developing capabilities needed for professional success
	Use real-life case studies in learning
	Have greater focus on skills like reading, writing, speaking and problem-solving
	Encourage students to study across a wider range of areas
	Encourage students to study specific areas of interest in greater depth
	Make assessment more real-world and problem-based
Enhance staff and teaching (α=0.63)	Increase interactions between students and academic staff
	Increase interactions between students and support staff
	Enhance careers advice
	Train staff to better understand learners' needs
	Ensure that teaching staff have current workplace experience and knowledge
Enhance student engagement (α=0.55)	Enhance students' participation in learning
	Challenge students to achieve high academic standards
	Enhance interactions between students
Work satisfaction (1, 3, 5 years) (α=0.82, 0.79, 0.72)	Overall, to what extent were you satisfied with this work?
	How did you rate your overall employability and skills?
	How much was your occupation related to the major field(s) of study in your bachelor degree(s)?
	How well did your 2002 bachelor degree prepare you for this work?
	Did you see yourself continuing this kind of work for the next three years?

The GPQ collected data on learners' educational outcomes. In line with the AUSSE (ACER, 2008), it asked graduates to report their average overall grade. It also asked graduates to report the extent to which their bachelor degree study had contributed to knowledge, skills and personal development in a range of key areas. Two scale scores are produced – general learning outcomes and general development outcomes. These self-reported learning gains have a long pedigree in higher education research having been shown to provide valid and reliable outcomes estimates.

Graduate satisfaction is often used as a means of determining the effectiveness of university education. Indeed in Australia, via a single 'overall satisfaction item' on the Course Experience Questionnaire (CEQ) (GCA & ACER, 2008; Griffin, Coates, James & McInnis, 2003), it has become one of the most significant measures. Satisfaction is surely important to the extent that it reflects a graduates' perception that they have received a return on their educational investment, and the GPS included a number of items to underpin a scale in this area.

The instrument also included a series of items to measure whether bachelor degree study was relevant and had prepared graduates well for their subsequent work and further learning. These were asked of the degree itself, and of each of the jobs that may be reported at the three specified intervals after graduation.

A total of nineteen items sought graduates' views on areas in which bachelor degree education could be improved to enhance graduates' employability and skills. These items were scored into four scales targeting specific areas in need of possible enhancement: learning contexts, focus of education, staff and teaching, and student engagement.

The main purpose of the GPQ was to measure graduates' work and further learning activities in the first, third and fifth year after study. Graduates were asked to report their main activity in an open-ended item to help capture information which might not be measured by an item with a closed-response format. They were asked to report on their participation in further study, and on their work and work seeking activity. Details on the characteristics of work were sought which aligned with the GDS. Graduates were also asked to respond to a series of questions on the connections between their bachelor degree study and work, and a work satisfaction scale was produced.

Fieldwork phase

The fieldwork phase involved coordinating fieldwork operations at participating universities, and managing central data entry and preparation activities.

Fieldwork operations were designed to maximise the nature and level of survey response. Based on similar surveys and considerations pertaining to the GPS, ACER planned around a conservative maximum response rate of 15 per cent.

An important first step in this phase involved engaging each participating university's operational staff in the fieldwork process. Their active involvement was critical for project outcomes. Preparations for fieldwork were made with survey managers between mid June and mid July.

As part of the Australasian Survey of Student Engagement (AUSSE) (ACER, 2008; Coates, 2008), ACER established an approach for managing devolved data collections that involve multiple institutions. The approach includes providing ongoing support to institutions, and is an important means of ensuring the quality of research processes and outcomes. In summary, it involves:

- institutions compiling a list of graduates in the defined target population and supplying a de-identified copy of this list to ACER
- ACER reviewing this list in consultation with institutions and advising any errors or possible problems
- institutions using the final list to append graduate contact details and distribute online and paper survey forms, and
- respondents sending completed survey forms and online responses directly back to ACER.

Around 100,000 paper survey packages were prepared, each consisting of a specially printed cover letter, outer envelope (DLX size), paper survey form and reply-paid envelope (DL size). Participating institutions were invited to provide a variant of the standard cover letter on university letter head and signed by the Vice Chancellor. Institutions were also be given the option of providing an institutionally branded outer envelope. All institution-specific materials were supplied to ACER in either printed or PDF format. ACER managed the production of all survey packages to ensure consistency of quality and efficiency.

A phased and multimodal approach to survey distribution was used that implemented key findings from research on 'survey engagement' conducted by Coates (2005) with 10 institutions. GPS administration included three email and one paper distribution of survey materials. This sequence of activities is summarised in Table 20. In addition to this, peak employer bodies and large graduate employers were asked during consultations to encourage 2002 graduates with who they may have contact to take part in the GPS.

Table 20 Summary of multimodal GPS distribution strategy

	Week starting
First email to all graduates	Friday 25 July
First mail out to all graduates	Friday 1 August
Second email to all graduates	Friday 8 August
Third email to all graduates	Friday 15 August

Research on the efficaciousness of response incentives is indeterminate (Coates, Tilbrook, Guthrie & Bryant, 2004). Given the risk of a low response rate, however, institutions was given the option of offering an incentive. Each institution was provided with $200 to cover the provision of a cash prize to one randomly selected respondent. Institutions were also asked to promote the collection through appropriate alumni communications.

Careful management of fieldwork operations was critical to the success of the project. ACER was in regular contact with universities throughout this phase to help guide and support their operations. This close liaison with universities played a critical role in ensuring the integrity of survey processes and hence project outcomes. The high-level technical oversight provided by ACER specialists helped prevent several major process errors.

During fieldwork one of the 39 institutions (Batchelor Institute of Indigenous Tertiary Education) elected not to participate in the collection.

No operational problems were encountered during fieldwork, suggesting that the design and planning of survey materials and processes was successful.

It was anticipated that due to the nature of the collection a steady flow responses would be received for many months, and steps were taken to keep data collection open for as long as possible. As a result, replies were received and processed until early October.

Data processing and verification

All completed paper and online survey forms were sent directly to ACER for processing, an important quality control feature in the design, and essential to ensure the confidentiality of response.

Forms were logged, collated and scanned. Response rates were monitored in real time, and unit-record feedback was provided to university staff to help them manage follow-up distributions.

Individually identified feedback was provided if graduates identified themselves on their returned survey forms.

All paper responses were received, collated, scanned and verified by ACER Project Services to conform to the GPS codebook. Given the somewhat exploratory nature of the study, a relatively large number of open-ended response questions were included on the GPQ, and these were coded using ICR software where possible to the Australian Standard Classification of Education (ASCED), Australian and New Zealand Standard Classification of Occupations (ANZSCO) and Australian and New Zealand Standard Industry Classification (ANZSIC). These taxonomies can be used at different levels of aggregation. GPS field of education information was coded to the narrow level, but is mostly analysed at the broad level in this report. Industry information was coded to the ANZSIC subdivision level, but is mostly analysed at the division level in this report. ANZSCO variables were coded to the sub-major group level, but are mainly considered in terms of major groups in this report. In addition, the first two major groups, 'managers' and 'professionals', are further coded as 'professional' or 'non-professional' occupations. Coding and analysis at these levels of aggregation were seen to reflect the best balance between policy, technical and substantive considerations. A MCEETYA index (Jones, 2004) was used to code locality based on postcodes.

An extensive number and range of quality checks were made to ensure the integrity of the raw data file. Among other operations, these sought to eliminate out-of-range responses and invalid or inconsistent codes, compare the sample data against key marker variables, test sampling assumptions about clustering, analyse and treat item-level missing data, calculate response and non-response rates, calculate post-stratification weights and final composite weights, and calculate standard errors of sampling based on the effective sample size. File and respondent identification numbers were added, and type and label information was added to all data elements and codes.

The analysis file was prepared once the raw data file had been verified. This involved several merges, aggregations, recodings, imputations, computation of derived and dummy variables, application of weights and filters, and sorting. All operations were documented in syntax files and verified by a secondary analyst.

File quality checks and cross-validations were made once the analysis file had been produced to ensure consistent links back to source data. Univariate and multivariate exploratory methods were applied to ensure the internal consistency of the file and hence confidence in results. A series of exploratory analyses were conducted before signing off on the data to help resolve residual problems.

Once verified, the raw and analysis files were signed off and documented copies of both were archived in SPSS 15.0 format.

Sample validation and weighting

New large-scale collections contain multiple uncertainties and possibilities, and to manage and understand these ACER established several sampling frames for reference. The 2003 Past Course Completion (PCC) file provided a baseline list of all 2002 bachelor degree graduates as reported by institutions in 2003. In addition, institutions were asked to provide ACER with their own de-identified list of 2002 bachelor degree graduates, prepared according to detailed ACER specifications. Within this sampling frame, they were asked to indicate at the unit record level which graduates were contactable, and by what means the contactable graduates could be expected to be reached. Further detail is given in the 2008 GPS Institution Administration Manual, which is supplied as an attachment to this report.

To assist with evaluation of response levels, it was important to count the number of graduates who could not be reached so as to correctly estimate the excluded and hence target populations. A detailed count of all email bouncebacks and returned mail was kept. Most postal returns came to ACER. Institutions were asked to report the number of email bouncebacks received and, for those that used their own outer envelopes, the number of postal returns.

Table 21 lists population and sample numbers sorted alphabetically by institution name. Figures for the generalisable population, the 2003 PCC, are listed first, followed by unweighted counts for various known exclusions (a, b, c and TL). (There is likely to be other exclusions that are unknown.) For each institution, numbers are given for their target population, this being the difference between the generalisable and excluded populations. The raw count of responses (as at Friday 19 October) is then provided. A response rate is shown. The count is of 'valid' responses in which data was supplied for at least 25 items. The figure 25 is based on empirical review and exploratory modelling, which suggests that this number of responses is required to deliver a meaningful response.

Table 21 Population and sample numbers

Institution	Population						Responses	
	General-isable	Excluded				Target		
		Not on uni list	Not contactable	Not deliverable	Total	N	n	%
Australian Catholic University	1,571	0	0	140	140	1,431	125	8.7
Australian National University	1,184	0	224	33	257	927	169	18.2
Bond University	331	0	16	41	57	274	33	12.0
Central Queensland University	1,961	-1	137	587	723	1,238	189	15.3
Charles Darwin University	468	49	7	70	126	342	51	14.9
Charles Sturt University	2,952	429	278	211	918	2,034	251	12.3
Curtin University of Technology	3,232	125	0	709	834	2,398	388	16.2
Deakin University	3,284	0	284	252	536	2,748	306	11.1
Edith Cowan University	2,623	0	697	82	779	1,844	192	10.4
Flinders University	1,975	83	233	77	393	1,582	277	17.5
Griffith University	3,768	1	0	750	751	3,017	375	12.4
James Cook University	1,454	41	0	325	366	1,088	104	9.6
La Trobe University	3,370	3	273	353	629	2,741	410	15.0
Macquarie University	2,359	-5	120	141	256	2,103	102	4.9
Monash University	5,464	-165	36	1,841	1,712	3,752	536	14.3
Murdoch University	1,530	6	33	409	448	1,082	336	31.1
Queensland University of Technology	4,715	-4	48	187	231	4,484	579	12.9
RMIT University	3,172	-3	88	63	148	3,024	255	8.4
Southern Cross University	1,489	-19	2	848	831	658	161	24.5
Swinburne University of Technology	1,458	0	3	86	89	1,369	111	8.1
University of Adelaide	2,292	83	0	480	563	1,729	382	22.1
University of Ballarat	841	-6	0	113	107	734	69	9.4
University of Canberra	1,367	112	45	158	315	1,052	100	9.5
University of Melbourne	4,834	-10	711	199	900	3,934	521	13.2
University of New England	1,694	0	265	418	683	1,011	264	26.1
University of New South Wales	3,374	-7	0	49	42	3,332	182	5.5
University of Newcastle	2,967	117	106	920	1,143	1,824	345	18.9
University of Notre Dame, Australia	173	-16	37	4	25	148	30	20.3
University of Queensland	4,953	389	452	265	1,106	3,847	515	13.4
University of South Australia	3,256	-1	568	289	856	2,400	261	10.9

Institution	Population						Responses	
	General-isable	Excluded				Target		
		Not on uni list	Not contactable	Not deliverable	Total	N	n	%
University of Southern Queensland	1,334	250	0	830	1,080	254	161	63.4
University of Sydney	5,451	532	805	63	1,400	4,051	325	8.0
University of Tasmania	2,198	55	66	203	324	1,874	230	12.3
University of Technology, Sydney	3,473	20	1,437	240	1,697	1,776	149	8.4
University of the Sunshine Coast	458	2	90	30	122	336	75	22.3
University of Western Australia	2,329	-14	291	21	298	2,031	205	10.1
University of Western Sydney	4,967	722	0	0	722	4,245	151	3.6
University of Wollongong	2,024	156	282	25	463	1,561	190	12.2
Victoria University	2,190	0	4	115	119	2,071	133	6.4
Total	98,214	2,603	7,638	11,627	21,868	76,346	9,238	12.1

While there are many interesting patterns in these numbers, a few preliminary comments are provided on key trends:

- the overall response rate (12.1%) is very close to the ACER's planned response rate of 15.0 per cent
- institution-level response rates vary from 3.6 per cent to 63.4 per cent
- the absolute number of responses per university varies from 30 to 579
- the excluded population ranged from 25 to 1,712 (raw counts), or from one per cent to 81 per cent of the generalisable population
- each institution supplied on average just over 200 responses
- there is little evident relationship between population size and response rate
- as anticipated given the new nature of the collection, the unintended excluded population is quite large – 22.3 per cent of the generalisable population
- in total, 2.7 per cent of the generalisable population was excluded due to variations between the PCC and university lists – institutions provided various reasons for these variations
- 7.8 per cent of the generalisable population was excluded due to lack of contact details known prior to fieldwork, and
- 11.8 per cent of the generalisable population was excluded due to lack of contact details discovered as a result of survey materials being undeliverable.

A few of these response rates may appear low, but it must be emphasised that the level of analysis for the 2008 GPS is national not institutional. What is important, given this, is whether a sufficient number of responses have been received to produce powerful estimates at the national level. This can be determined using sampling theory.

Treating institutions as clusters of 200 responses and assuming 10 per cent homogeneity within clusters implies a 'design effect' for the complex sample of 20.9. Given this, a sample of around 8,000 would be required to be as effective as a simple random sample of 400 and produce estimates with conventional levels of precision (±5%). The preliminary sample size of 9,238 is thus sufficient for producing national estimates that have desired precision.

It was decided that GPS data would be weighted within each institution by sex and broad field of education (BFOE). This is because it is anticipated that these factors would influence response and also variables of analytical interest. Indeed, Figure 59 and Figure 60 show that disproportionately more females than males responded, as did students in fields 5, 6 and 9.

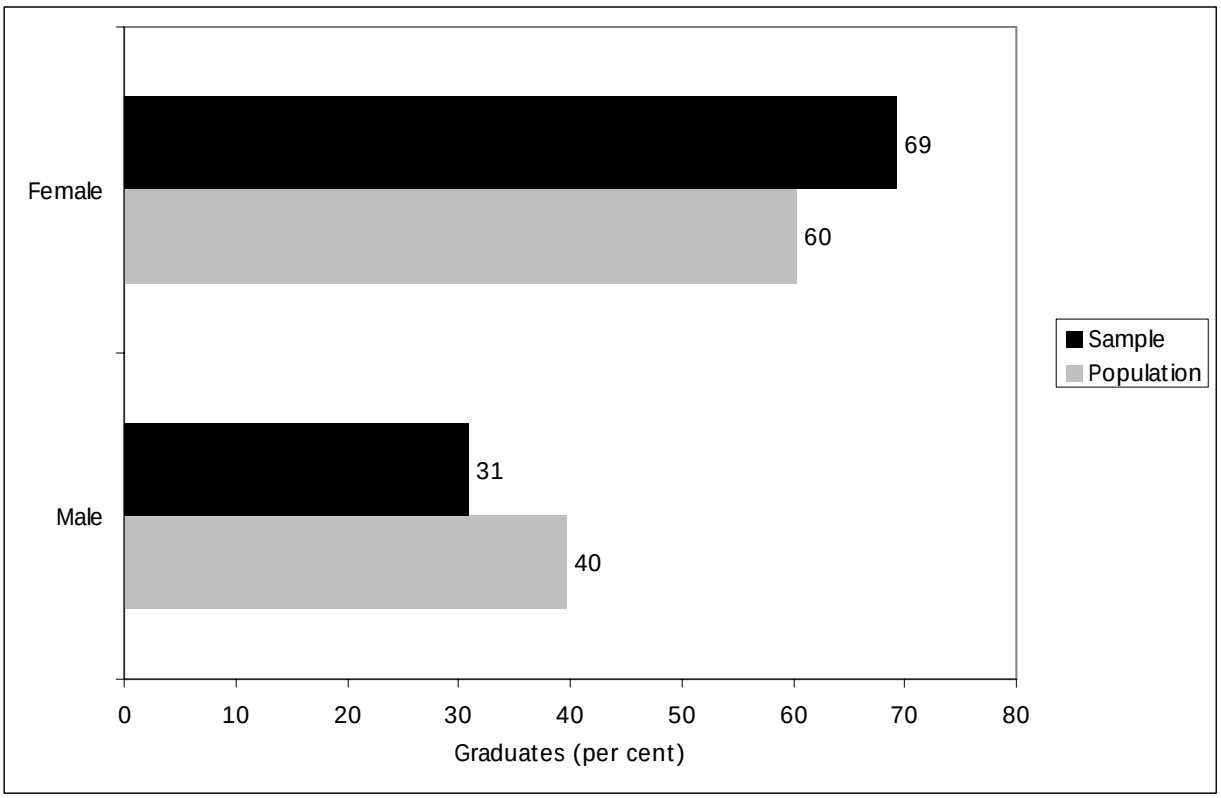

Figure 59 Population and sample sex distributions (per cent)

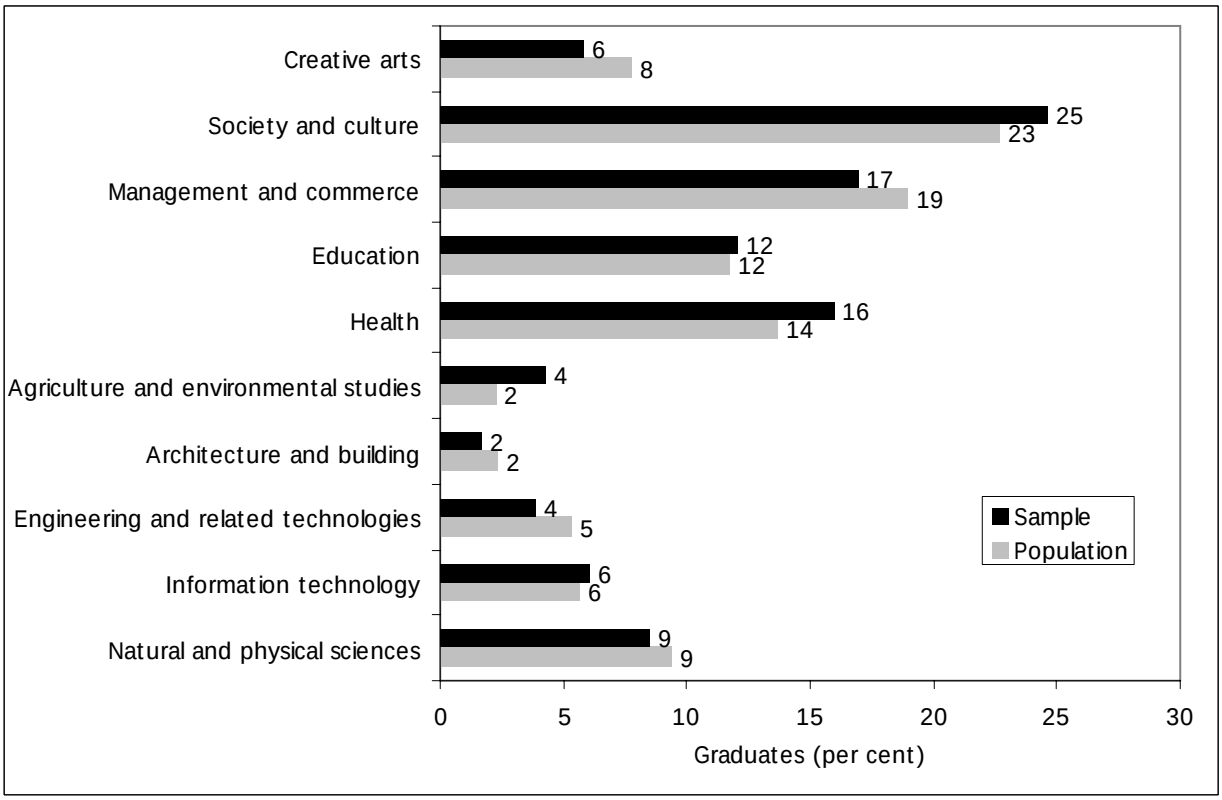

Figure 60 Population and sample BFOE distributions (per cent)

Post-stratification weights were calculated in three different ways. Weights were calculated by sex and field, for just sex, and for the institution overall. These weights were applied in this order as possible given missing data in the file.

Of course it is important that this level of response is reasonably sustained across all items in the Graduate Pathways Questionnaire (GPQ). The GPS consists of five sections, labelled A to E in Figure 61. The graph shows that, as expected, graduates who returned a paper form completed all sections. There was more unreached non-response with the online instrument, a common characteristic of online responses. This can be controlled for (as in the 2008 Australasian Survey of Student Engagement) by using several versions of the rotated instrument, however this was not attempted with the 2008 GPQ given the sequential nature of the sections.

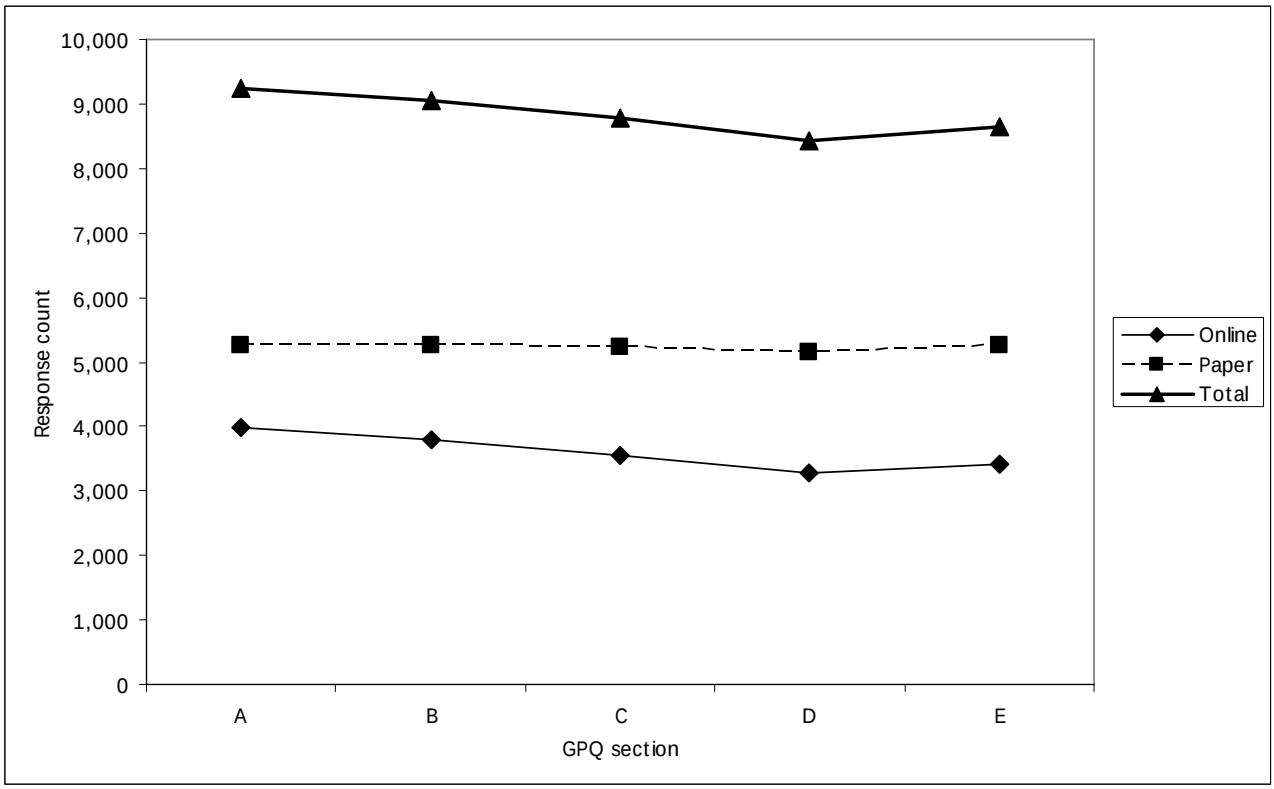

Figure 61 Response count by section and mode

Overall, these counts affirm that a sufficient amount number of survey responses have been secured to produce powerful estimates of 2002 bachelor degree graduates' pathways beyond study. From a practical perspective, this level of response also affirms the reasonably high levels of institutions' and graduates' engagement in the process – an important outcome in its own right. Altogether, results from these initial analyses suggest that the 2008 GPS can be used to produce valid and powerful new insights into the outcomes of Australian university education.

In addition to comparison against data from the DEST Higher Education Student Collection, the GPS population figures were cross validated data from the 2006 ABS Census to compare population characteristics and distribution of the sample with the characteristics of the whole population. Cross validation was also attempted using the ABS Education and Work survey. However, it was found that for the level of detail required in this validation, Census data provided a better means of validation.

Two census matrices were specified in this process. The variables gathered in this census data have been chosen to match with a number of key demographic variables in the GPS. The census data was specified to contain a population base as comparable to the GPS population as possible. The broad population included in the census specification are persons aged between 25 and 30 years old, with

at least a bachelor degree, who were in Australia prior to 2003 (that is, they were born in Australia, or arrived in the country in or before the reference year for degree completion in the GPS).

The relevant age cohort from the GPS was examined to accurately cross validate the GPS data with the census population statistics. For this task, the age cohort from the GPS data is those aged from 27 to 32 years as these persons were 25 to 30 at the time of the census in 2006. This age group represents the majority of respondents to the GPS (56.8%). Of those GPS respondents not included in this cross validation, 13.2 per cent were aged under 27 years and 30 per cent were aged over 32 years. The use of this 27 to 32 year old cohort for this analysis allows more accurate matching with the census and provides a good impression of the extent to which the data collected in the GPS is representative of the Australian population with a bachelor degree as a whole.

The main caveat in relation to the matching of the census and GPS data is that it is not possible to identify the year of bachelor degree completion using the data from the 2006 census. Therefore, while those in the census population examined here have a bachelor degree, they may not necessarily have completed it in 2002 (as did the GPS population). As a result, these comparisons are not exact population matches. However, for these cross validation purposes, they do provide a very good indicative population for which to match the GPS respondent characteristics.

Table 22 shows that when comparing the sex distribution of the GPS and census cohorts, the distributions are virtually identical. Note that the population for GPS 2008 is 27 to 32 year olds, while the population for the census 2006 is 25 to 30 year olds with bachelor degrees.

Table 22 GPS sample and ABS Census data distributions by sex

	GPS	ABS Census
Male	41	41
Female	59	59

Table 23 shows that the GPS and census distributions align in terms of whether people's place of usual residence is in the capital city or other areas of their state.

Table 23 GPS sample and ABS Census data distributions by residential location

	GPS	ABS Census
Sydney	27	28
Balance of New South Wales	7	6
Melbourne	25	26
Balance of Victoria	4	4
Brisbane	9	10
Balance of Queensland	6	6
Adelaide	5	5
Balance of South Australia	1	1
Perth	8	8
Balance of Western Australia	1	1
Greater Hobart	1	1
Tas Balance	1	0
Darwin	0	1
Balance Northern Territory	0	0
Australian Capital Territory	3	3

Table 24 shows that the GPS sample is relatively well distributed compared with the 2006 ABS Census in terms of field of education. As with many other large scale surveys of university students and graduates (for example the Graduate Destination Survey (GCA, 2008) and the Australasian Survey of Student Engagement(ACER, 2008)), the share of responses from those in the Society and Culture and the Natural and Physical Sciences is slightly higher in the population than yield of

secured responses. At the other extreme, the share of Management and Culture respondents is lower in the GPS sample – again a similar outcome to other large scale surveys carried out in Australia. The only discrepancy (albeit a small variation) is in the Education field, where the GPS sample has a lower representation than the census population. The reason for this is likely to be due to the fact that the GPS collection focussed on those completing their bachelor degree in 2002, and given that some people take an Education degree as a graduate program, the GPS sample is likely to be a slight under representation.

Table 24 GPS sample and ABS Census data distributions by broad field of education

	GPS	ABS Census
Natural and physical sciences	11	7
Information technology	6	7
Engineering and related technologies	7	7
Architecture and building	3	2
Agriculture and environmental studies	3	2
Health	13	13
Education	11	14
Management and commerce	20	22
Society and culture	20	16
Creative arts	7	7
Other	0	3

Table 25 shows the labour force status of GPS respondents and the specified census population. The full- and part-time work figures are somewhat different due to differences in the collection procedure between the census and the GPS. The census data has a third category in this group – 'employed, away from work', which does not specify whether the person is away from full- or part-time work. As such, the employed row in Table 25 provides the most comparable indicator for job status. For the census data, this row included 'full time', 'part time' and the 'away from work' categories.

The proportions of people employed, not working and unemployed within these two populations are closely comparable and indicate that the GPS sample is representative of the population. Note that the 'employed' figure for the census includes those who were 'away from work'. These people were not included in the full- or part-time census calculations. The unemployment rate is calculated according to ABS method, and includes only those persons in the labour force, not those who are not working but not seeking work. As before, the population for GPS 2008 is 27 to 32 year olds while the population for census 2006 is 25 to 30 year olds with bachelor degrees.

Table 25 GPS sample and ABS Census data distributions by labour-force participation

	GPS	ABS Census
Working full time	79	71
Working part time	12	15
Employed	92	90
Not working	8	9
Unemployment rate	2	2

The broad occupational spread of the GPS sample also shows a relatively accurate representation when compared with the 2006 ABS Census data – see Table 26. The proportion of professionals in the GPS sample is slightly lower than the overall census population. Among the 'other occupations', the majority of the GPS group are clerical and administrative workers. The discrepancy in the numbers in professional occupations may be due to differences in coding processes between the collections.

Table 26 GPS sample and ABS Census data distributions by occupation type

	GPS	ABS Census
Managers	10	10
Professionals	56	63
Other occupations	34	26

Table 27 shows that in general, the GPS population was more likely to be involved in further study than those within the census population. There are likely to be a number of reasons for this discrepancy. First, the definitions and questions used for this item differ between the census and the GPS, therefore making the categories emphasised here more difficult to match. This is particularly the case for the 'short training course' value. Second, the GPS participants were those who were able to be contacted through their tertiary institution and therefore, it is likely that up-to-date contact details are more likely to exist for those who have been involved in education subsequent to the completion of their bachelor degree. As a result, it is possible that some bias exists in relation to this variable.

Table 27 GPS sample and ABS Census data distributions by current enrolment status

	GPS	ABS Census
Not enrolled in study or training	62	83
Short training course	11	2
Vocational certificate or diploma	5	2
University study	24	14

There are notable discrepancies in the highest educational qualification variable between the GPS and census cohorts compared here, as shown in Table 28. The GPS sample is more likely to have undertaken a further degree following the completion of their bachelor degree than the population identified in the census data. These differences are again likely to be related to the higher likelihood of up-to-date contact details for people who have undertaken further study. In addition, the different questions and response options for this variable in the GPS and census make comparison of some of the values less accurate.

Table 28 GPS sample and ABS Census data distributions by highest qualification

	GPS	ABS Census
Bachelor Degree	69	85
Graduate Diploma and Graduate Certificate	14	6
Masters Degree	12	8
Doctorate	5	1

Overall, the comparison of the GPS respondent and 2006 ABS Census population characteristics show that a relatively representative sample has been obtained through the data collection for this research. Some bias in the sample has been identified in relation to educational qualifications and current engagement in study. However, the comparison of these specific variables between the GPS and census does not provide an exact duplication of values and therefore is unlikely to be completely accurate. On the strictly comparable variables such as sex, residential location, field of education and labour force status, the GPS and census population distributions are almost identical.

Analysis and reporting

A range of psychometric analyses were undertaken to test the measurement and distributional properties of the response data. Composite variables were produced, and distributional properties used to inform subsequent statistical modelling. Rasch item response modelling and confirmatory factor modelling were used where necessary to quantify measurement error and ensure the linearity of any scaled scores.

A range of univariate, bivariate and multivariate techniques were used to describe and explain pertinent patterns and trends. Given the extensive number of variables, a series of tables were produced to underpin the main statistical analyses. A number of covariance analyses were undertaken to explore specific propositions in more detail.

ACER prepared a draft structure for this project report early in the design phase. Feedback on this draft was sought from DEEWR. The draft report was prepared as review and analyses took shape.

Reports were prepared with the primary audience of the DEEWR in mind, but also with a view to the findings being of interest to State and Territory Departments of Education, Universities Australia, universities, secondary schools, and university students and graduates.

The report authors presented key findings from the draft report to DEEWR. This presentation was scheduled so that feedback on the draft consolidated report could be incorporated into a revised final report. A plain English summary report was prepared. All reports were fully referenced and written to a publishable standard.

The final report and any data sets created during the analyses were documented and readied for submission and delivered in electronic form, along with the necessary technical documentation.

In addition, as mentioned above, ACER provided each institution with an executive report relevant to the university.

ATTACHMENT

Graduate Pathways Questionnaire (GPQ) 2008

A copy of the 2008 Graduate Pathways Questionnaire is provided as an attachment to this report. A copy of the online instrument can be viewed at www.acer.edu.au/gps.

E. About you

Are you male or female? Male ☐ Female ☐

How old are you in years? ☐☐ YEARS

Before 2003, were you a permanent resident or citizen of either Australia or New Zealand? No ☐ Yes ☐

What is the main language you speak in your home?

Are you of Aboriginal or Torres Strait Islander origin?
- ☐ No
- ☐ Yes, Aboriginal
- ☐ Yes, Torres Strait Islander
- ☐ Yes, Aboriginal and Torres Strait Islander

Do you consider yourself to have a disability, impairment or long-term medical condition? No ☐ Yes ☐

Which of the following best describes the area in which you lived at the end of primary school?
- ☐ Isolated or remote area
- ☐ Rural or country area
- ☐ Regional or provincial town
- ☐ Capital city

What was the postcode and locality/suburb of your home in your final year of primary school? Write postcode opposite and locality/suburb below. ☐☐☐☐

If you completed school in Australia, did you complete Year 12 in a Government, Catholic or independent school?
- ☐ Government
- ☐ Catholic
- ☐ Independent

What was the postcode of your home on 30 April 2008? ☐☐☐☐

Taking into account all of your formal education and training, what is currently the level of your highest qualification?
- ☐ Bachelor degree (pass)
- ☐ Bachelor degree (honours)
- ☐ Graduate certificate
- ☐ Graduate/postgraduate diploma
- ☐ Masters degree by coursework
- ☐ Masters degree by research
- ☐ Doctorate by coursework
- ☐ Doctorate by research

How are you currently involved with the university in which you completed your bachelor degree(s)? Leave blank if no involvement.

Would you like more opportunities to become involved in the university at which you completed your bachelor degree(s)?
- ☐ No
- ☐ Yes, for social reasons
- ☐ Yes, for professional reasons
- ☐ Yes, for further study
- ☐ Other, please specify:

Did you have sisters or brothers who attended university before you? No ☐ Yes ☐

What is the highest level of education completed by your father?
- ☐ No school or primary school
- ☐ Some or all of secondary school
- ☐ Vocational certificate or diploma
- ☐ University degree or diploma
- ☐ Not sure

What was your father's main occupation during your final year of primary school? For example: SCHOOL TEACHER, KITCHEN HAND, SALES MANAGER, UNEMPLOYED, HOME DUTIES

What were your father's main tasks or duties in that job? Describe as fully as possible. For example: PRIMARY SCHOOL TEACHING, AUDITING AS A MEMBER OF AN AUDIT TEAM

What is the highest level of education completed by your mother?
- ☐ No school or primary school
- ☐ Some or all of secondary school
- ☐ Vocational certificate or diploma
- ☐ University degree or diploma
- ☐ Not sure

What was your mother's main occupation during your final year of primary school? For example: SCHOOL TEACHER, KITCHEN HAND, SALES MANAGER, UNEMPLOYED, HOME DUTIES

What were your mother's main tasks or duties in that job? Describe as fully as possible. For example: PRIMARY SCHOOL TEACHING, AUDITING AS A MEMBER OF AN AUDIT TEAM

Please provide your name, university student identification number or email if you would like to be placed into the draw to win the prize being offered by your university. Your university will randomly select one winner from its identified responses. Your details will only be used to manage the survey and will be deleted from the final data. No individual is identified in any analyses or reports.

Thank you for sharing your views.
After completing the questionnaire, please put it in the supplied reply-paid envelope and deposit it in any postbox. For further information, see: www.acer.edu.au/gps

gps Graduate Pathways Survey

ACER

Australian Government
Department of Education, Employment and Workplace Relations

Please tell us about the bachelor degree(s) you completed in 2002 and your work and study in 2008, 2005 and 2003. Mark your answers in the boxes. Please respond in CAPITAL letters where appropriate.

A. Your 2002 bachelor degree(s)

What single factor had the most influence on your decision to attend university? For example: STUDYING A FIELD OF INTEREST, DEVELOPING WORK SKILLS, IMPROVING JOB PROSPECTS, FAMILY EXPECTATIONS, CAREERS ADVICE, WORK EXPERIENCE

At which university did you undertake the bachelor degree(s) you completed in 2002? For example: ANU, Curtin, Flinders, JCU, VU

What is the name of the bachelor degree(s) you completed in 2002? For example: SCIENCE, COMMERCE, LAW, ARTS

What were the major field(s) of education in your degree(s)? Please be as specific as possible. For example: ACCOUNTING, PRIMARY EDUCATION, PSYCHOLOGY, TAXATION LAW

What single factor had the most influence on your decision to study in your chosen field(s) of education? For example: INTEREST, SCHOOL MARKS, CAREER PLANS, FAMILY EXPECTATIONS

Did you complete your bachelor degree(s) in your most preferred field(s) of education? No ☐ Yes ☐

In what year did you commence your bachelor degree(s)? ☐☐☐☐

Where was your study mainly based during your bachelor degree(s)?
- ☐ On one or more campuses
- ☐ Mix of external/distance and on-campus
- ☐ External/distance

During your bachelor degree(s) were you enrolled mainly part time, full time or a mix of both?
- ☐ Full time
- ☐ Mix of part time and full time
- ☐ Part time

On average during your bachelor degree(s), how many hours per week did you work for pay? Write '00' if none. ☐☐ HOURS

Which category best represents your average overall grade in your bachelor degree(s)?
- ☐ 50 to 59
- ☐ 60 to 69
- ☐ 70 to 79
- ☐ 80 to 89
- ☐ 90 to 100

To what extent did your experience during your bachelor degree(s) contribute to your knowledge, skills and personal development in each of the following areas?

	Very little	Some	Quite a bit	Very much
Acquiring job- or work-related knowledge and skills	☐	☐	☐	☐
Writing clearly and effectively	☐	☐	☐	☐
Speaking clearly and effectively	☐	☐	☐	☐
Thinking critically and analytically	☐	☐	☐	☐
Analysing quantitative problems	☐	☐	☐	☐
Using computing and information technology	☐	☐	☐	☐
Working effectively with others	☐	☐	☐	☐
Learning effectively on your own	☐	☐	☐	☐
Understanding people of other racial and ethnic backgrounds	☐	☐	☐	☐
Solving complex, real-world problems	☐	☐	☐	☐
Developing a personal code of values and ethics	☐	☐	☐	☐
Contributing to the welfare of your community	☐	☐	☐	☐
Developing general industry awareness	☐	☐	☐	☐
Understanding different social contexts	☐	☐	☐	☐

	Poor	Fair	Good	Excellent
Overall, how would you evaluate the careers advice at your university?	☐	☐	☐	☐
How would you evaluate your entire educational experience during your bachelor degree(s)?	☐	☐	☐	☐

	Definitely no	Probably no	Probably yes	Definitely yes
Overall, was your bachelor degree study worth the cost, time and effort?	☐	☐	☐	☐
If you could start over again, would you go to the same university?	☐	☐	☐	☐
If you could start over again, would you choose to do the same bachelor degree(s)?	☐	☐	☐	☐

Overall, how beneficial has your bachelor degree study been for each of the following activities?

	Very little	Some	Quite a bit	Very much	Not applicable
Subsequent university study	☐	☐	☐	☐	☐
Subsequent vocational study	☐	☐	☐	☐	☐
Paidwork in 2008	☐	☐	☐	☐	☐
Paidwork in 2005	☐	☐	☐	☐	☐
Paidwork in 2003	☐	☐	☐	☐	☐
Long-term career goals	☐	☐	☐	☐	☐

What aspects of your bachelor degree(s) have been MOST RELEVANT to your subsequent work and study?

To enhance graduates' employability and skills, what level of importance should be given to improving bachelor degree education in each of the following areas?

	Low	Medium	High
Focus more on developing capabilities needed for professional success	☐	☐	☐
Use real-life case studies in learning	☐	☐	☐
Have greater focus on skills like reading, writing, speaking and problem-solving	☐	☐	☐
Enhance students' participation in learning	☐	☐	☐
Challenge students to achieve high academic standards	☐	☐	☐
Increase interactions between students and academic staff	☐	☐	☐
Increase interactions between students and support staff	☐	☐	☐
Enhance careers advice	☐	☐	☐
Increase interactions between students	☐	☐	☐
Enhance the convenience of study	☐	☐	☐
Develop more supportive learning environments	☐	☐	☐
Offer more enriching experiences and activities outside of class	☐	☐	☐
Introduce more fieldwork, placements and internships	☐	☐	☐
Train staff to better understand learners' needs	☐	☐	☐
Have fewer lectures and more seminars, workshops and symposia	☐	☐	☐
Encourage students to study across a wider range of areas	☐	☐	☐
Encourage students to study specific areas of interest in greater depth	☐	☐	☐
Ensure that teaching staff have current workplace experience and knowledge	☐	☐	☐
Make assessment more real-world and problem based	☐	☐	☐
Other, please specify:	☐	☐	☐

What aspects of your bachelor degree(s) have been LEAST RELEVANT to your subsequent work and study?

	B. Your activity in April 2008	C. Your activity in April 2005	D. Your activity in April 2003
What was your main activity?			
Were you enrolled in any formal education or training? Mark all that apply.	☐ Not enrolled in study or training ☐ Short training course ☐ Vocational certificate or diploma ☐ Undergraduate degree or diploma ☐ Postgraduate degree, certificate or diploma	☐ Not enrolled in study or training ☐ Short training course ☐ Vocational certificate or diploma ☐ Undergraduate degree or diploma ☐ Postgraduate degree, certificate or diploma	☐ Not enrolled in study or training ☐ Short training course ☐ Vocational certificate or diploma ☐ Undergraduate degree or diploma ☐ Postgraduate degree, certificate or diploma
Were you seeking work (even if you were already working)? Mark all that apply.	☐ No, not seeking work ☐ Yes, seeking part-time work ☐ Yes, seeking full-time work	☐ No, not seeking work ☐ Yes, seeking part-time work ☐ Yes, seeking full-time work	☐ No, not seeking work ☐ Yes, seeking part-time work ☐ Yes, seeking full-time work
What was your situation regarding paid work (including self-employment)?	☐ Not working (go to the top of the next column) ☐ Working full time ☐ Working part time	☐ Not working (go to the top of the next column) ☐ Working full time ☐ Working part time	☐ Not working (go to the next page) ☐ Working full time ☐ Working part time
	Your main PAID work on 30 April 2008	**Your main PAID work on 30 April 2005**	**Your main PAID work on 30 April 2003**
What was your employer's business name in full?			
What was your employer's main business? For example: FINANCIAL SERVICES, EDUCATION, HEALTH			
In which country was your employment based?			
What was the full title of your occupation? For example: SECONDARY TEACHER, GENERAL NURSE, ACCOUNTANT			
What were the main tasks or duties in your job? Describe as fully as possible. For example: PRIMARY SCHOOL TEACHING, AUDITING COMPANY ACCOUNTS			
In what month and year did you start doing this job? For example, write '03/2001' for March 2001.	☐☐/☐☐☐☐	☐☐/☐☐☐☐	☐☐/☐☐☐☐
Which one of the following best described your employment?	☐ Temporary or casual ☐ Fixed-term contract up to 12 months ☐ Fixed-term contract more than 12 months ☐ Permanent or open-ended contract	☐ Temporary or casual ☐ Fixed-term contract up to 12 months ☐ Fixed-term contract more than 12 months ☐ Permanent or open-ended contract	☐ Temporary or casual ☐ Fixed-term contract up to 12 months ☐ Fixed-term contract more than 12 months ☐ Permanent or open-ended contract
On average, how many hours per week were you working in your main job?	☐☐ HOURS	☐☐ HOURS	☐☐ HOURS
What was your gross (pre-tax) annual salary in Australian dollars? Estimate if necessary. Write a yearly figure.	AUSTRALIAN DOLLARS $ ☐☐☐,☐☐☐.00	AUSTRALIAN DOLLARS $ ☐☐☐,☐☐☐.00	AUSTRALIAN DOLLARS $ ☐☐☐,☐☐☐.00
Overall, to what extent were you satisfied with this work?	Not at all ☐ Very little ☐ Some ☐ Quite a bit ☐ Very much ☐	Not at all ☐ Very little ☐ Some ☐ Quite a bit ☐ Very much ☐	Not at all ☐ Very little ☐ Some ☐ Quite a bit ☐ Very much ☐
How did you rate your overall employability and skills?	Poor ☐ Weak ☐ Average ☐ Good ☐ Excellent ☐	Poor ☐ Weak ☐ Average ☐ Good ☐ Excellent ☐	Poor ☐ Weak ☐ Average ☐ Good ☐ Excellent ☐
How much was your occupation related to the major field(s) of study in your bachelor degree(s)?	Not at all ☐ Very little ☐ Some ☐ Quite a bit ☐ Very much ☐	Not at all ☐ Very little ☐ Some ☐ Quite a bit ☐ Very much ☐	Not at all ☐ Very little ☐ Some ☐ Quite a bit ☐ Very much ☐
How well did your bachelor degree(s) prepare you for this work?	Not at all ☐ Very little ☐ Some ☐ Quite a bit ☐ Very much ☐	Not at all ☐ Very little ☐ Some ☐ Quite a bit ☐ Very much ☐	Not at all ☐ Very little ☐ Some ☐ Quite a bit ☐ Very much ☐
What single factor was most influential in shaping the kind of work you were doing? For example: NETWORKS, QUALIFICATIONS, FAMILY, EXPERIENCE			
Did you see yourself continuing this kind of work for the next three to five years?	Definitely no ☐ Probably no ☐ Probably yes ☐ Definitely yes ☐	Definitely no ☐ Probably no ☐ Probably yes ☐ Definitely yes ☐	Definitely no ☐ Probably no ☐ Probably yes ☐ Definitely yes ☐