

Manufacturing careers and training

Introduction

- 6.1 There is good and bad news with regards to careers, training and employment in the Australian manufacturing sector. While there is plenty of opportunity for Australians to develop diverse careers in this developing sector, there is little desire on the part of young people, in particular, to do so. This is largely due to the wide range of other employment opportunities available in the current economic conditions and poor community attitudes towards the industry.

Employment options and opportunities in the manufacturing sector

- 6.2 There are a growing number of opportunities for employment in the manufacturing sector—as lines are blurring between some industries within the manufacturing and services sectors and the science/innovation field. This considerably broadens the scope of employment in the industry.
- 6.3 Manufacturing today employs a wide range of capabilities and qualifications. Not only are technical and research skills required but increasingly, sophisticated logistics and marketing skills as well.
- 6.4 The industry employs the semi-skilled, trade and university qualified and is seeing a steady rise in university qualified technicians and scientists at the development end.

The skills shortage

- 6.5 Careers and employment in the manufacturing sector operate within the wider context of an Australian skills shortage, in which demand for skilled labour outstrips supply.¹
- 6.6 Of all the factors affecting production, the March 2007 quarter issue of the *Survey of Australian Manufacturing* reported 'labour shortages were the largest drag on production.'²
- 6.7 The Victorian Government submission claims 'one in two manufacturing companies experience difficulties in obtaining skilled labour' and it cites electricians, engineers, mechanics, welders, plant managers and sheet metal workers as being highly sought after.³ The Treasury Autumn 2007 *Economic Roundup* confirms this view in results from business liaison:
- Skill shortages are particularly viewed as a problem ... by companies with workers such as engineers and electricians whose skills are readily transferable to the mining sector.⁴
- 6.8 The Department of Education, Science and Training (DEST) note in their submission that the national priorities of the *Commonwealth–State/Territory Agreement for Skilling Australia's Workforce* include addressing skills shortages 'in traditional trades and in emerging industries.'⁵ The submission also highlights the particular skills shortages experienced in regional areas and how the Targeting Skills Needs in Regions programme is focussing on addressing this problem in 'regions of strategic economic importance.'⁶
- 6.9 The skills shortage is compounded by new technologies that demand increased and diversified skill sets from manufacturing workers. Furthermore, the greatest barrier to innovation being undertaken in Australian innovating businesses is a lack of skilled staff.⁷ This impediment affects the manufacturing sector disproportionately; it being the most innovative of sectors.

1 The skills shortage has been recognised by the Australian Government in a range of initiatives since the late 1990s – including the national skills shortage strategy established in 1999.

2 Australian Industry Group and PricewaterhouseCoopers, *Survey of Australian Manufacturing: March Quarter 2007*, Sydney, p. 4.

3 Victorian Government, *Submission no. 40*, p. 12.

4 The Treasury, *Economic Roundup: Autumn 2007*, Canberra, 14 June 2007, p. 72.

5 Department of Education, Science and Training (DEST), *Submission no. 49*, p. 3.

6 DEST, *Submission no. 49*, p. 13.

7 Australian Bureau of Statistics, *Innovation in Australian Business*, cat. no. 8158.0, ABS, Canberra, 2007, p. 25.

- 6.10 The February 2006 COAG communiqué on *A New National Approach to Apprenticeships, Training and Skills Recognition* identified the 'growing need for higher level skills' as an area requiring further reform in Australia.⁸ Similarly, the Australian Industry Group (Ai Group) has reported that a higher level, broader range and more frequently updated set of skills is required by the manufacturing sector.⁹

An image problem for manufacturing

- 6.11 At a time when new and existing skills are in high demand, manufacturing careers are not. While the industry has moved on from the 'dark satanic mills' of centuries ago, the community still sees manufacturing as a 'dirty' or diminishing industry. This makes recruitment of new workforce participants and workers from other fields/sectors who are prepared to retrain, a challenge. This backdrop may also deter those already in manufacturing from up-skilling. The poor perception of the sector is exacerbated by reports of declining employment trends which do not consider the dynamism of the sector nor the emerging work opportunities.¹⁰ The Victorian Government noted:

The perception of manufacturing remains outdated and unfortunately unattractive. The resultant effects of the poor image include difficulties in recruiting fresh talent, in obtaining finance for growth and in carrying weight in national policy development.¹¹

- 6.12 There is anecdotal evidence that parents and teachers discourage young people from jobs in manufacturing because they think the industry is moving offshore, in demise and holds little career prospects—as Mr Brett Manwaring, chief financial officer of regional Victorian textiles company, Bruck Textiles, noted:

8 Council of Australian Governments, Communiqué, 10 February 2006, as viewed 15 May 2007, <<http://www.coag.org.au/meetings/100206/index.htm>>.

9 Australian Industry Group, *World Class Skills for World Class Industries*, May 2006.

10 Department of Workforce and Employment Relations, *Australian Jobs 2007*, DEWR, Canberra, June 2007, p. 15, viewed 27 June 2007, <<http://www.workplace.gov.au/NR/rdonlyres/00DD2708-97DA-47AF-8A7A-15F12196C447/0/AustralianJobs2007Workplace.pdf>>. The report cited a projected overall decline in manufacturing employment of 33 600 jobs over the next five years. This projection, based on trends of the last 20 years, was subsequently reported in Adrian Rollins, 'Manufacturing work shrinks', *The Australian Financial Review*, 19 June 2007, p. 6.

11 Victorian Government, *Submission No. 40*, p. 13.

Fifteen years ago, if you were in Wangaratta you were told, 'If you do well at school you'll get a job at Bruck.' It has changed to: 'If you don't do well at school, you'll get a job at Bruck.'¹²

6.13 There is a role for both government and industry to promote to the broader community the genuine opportunities and career pathways available in the manufacturing industry. Mr Paul Laver, vice president of the Australian Academy of Technological Sciences and Engineering (AATSE) told the committee:

I think they [parents and teachers] have to start telling them [students] that you put up with hell while you do your four years as an apprentice, but within a couple of years of that, if you wanted to live outside a capital city, you could probably be up in the \$80,000 to \$100,000 range quite easily.¹³

6.14 The UK Government has championed manufacturing through its Manufacturing Strategy (2002 & 2004) focusing on industry's metamorphosis from antiquated factories and repetitive shop floors to sustainability, clean production lines and cutting edge scientific research – this is a good working model for Australian governments to follow.¹⁴

6.15 Similarly, the Victorian Government's 2003 Manufacturing Policy, *Agenda for New Manufacturers*, challenges manufacturers (among other things) to:

- 'highlight manufacturing's links to industrial design, biotechnology, information technology and the services sector.
- contribute to the marketing and public information efforts of industry bodies; and
- encourage graduates to apply for rewarding manufacturing careers and make them feel welcome when they are successful.'¹⁵

6.16 At an anecdotal level, young people respond positively to information about the sector. Mr Manwaring continued:

12 Mr B Manwaring, Bruck Textiles, *Transcript*, 8 February 2007, p. 14.

13 Mr P Laver, Australian Academy of Technological Sciences and Engineering (AATSE), *Transcript*, 28 August 2006, p. 48.

14 Department of Tourism and Industry, *Review of the Government's Manufacturing Strategy – Competing in the Global Economy, the Manufacturing Strategy Two Years On*, as viewed 22 May 2007, <<http://www.dti.gov.uk/files/file18188.pdf>>.

15 Victorian Government, *Agenda for New Manufacturing 2003*, p. 11, as viewed 22 May 2007, <http://www.business.vic.gov.au/busvicwr/_assets/main/lib60015/agendanewmanufacturing03.pdf>.

When we actually go to them [students] and show them the opportunities that are there, they are just blown away.¹⁶

Occupational Health and Safety

- 6.17 While Chapter 3 discusses the regulatory burden that occupational health and safety (OH&S) places on manufacturers, poor perceptions of OH&S in manufacturing also have a detrimental effect on its image as a viable career option. The National OH&S Strategy 2002–2012 identified manufacturing as one of the four priority target industries as a result of its high OH&S incidence rates and workers' compensation claims.¹⁷
- 6.18 In 2004–05, 28 770 manufacturing workers made compensation claims, accounting for 20 per cent of all workers' compensation claims where the employee was off work for one week or more. While the incidence rate of claims in the manufacturing industry has fallen from 40 claims per 1000 employees (1996–97) to 31 claims per 1000 employees (2003–04), it is almost twice as high as the overall rate for Australia, at 17 claims per 1000 employees and is the second highest of all industries.¹⁸
- 6.19 Additional concerns have been raised about the unknown health implications of working with new technologies, such as nanotechnology.¹⁹
- 6.20 The 2006 National Industry Skills Report notes that some industries (not specifically manufacturing) need to proactively counter public perceptions about safety records in order to attract workers.²⁰ Harmonised national OH&S standards would assist with this.

16 Mr B Manwaring, Bruck Textiles, *Transcript*, 8 February 2007, p. 14.

17 Australian Safety and Compensation Commission, *National OH&S Strategy 2002–2012*, as viewed 25 May 2007, <<http://www.ascc.gov.au/NR/rdonlyres/E8D707CF-9E69-4C61-A063-F04519170EF7/0/NationalOHSStrategy200212.pdf>>.

18 Australian Safety and Compensation Commission, *Information Sheet: Manufacturing*, p. 1, as viewed 25 May 2007, <http://www.ascc.gov.au/NR/rdonlyres/8AE325C4-0C73-4317-A332-E3268ED22C2B/0/ASCCinfo_Manufacturing.pdf>.

19 Australian Safety and Compensation Commission, *A Review of the Potential OH&S Implications of Nanotechnology*, pp. 11–12, as viewed 25 May 2007, <<http://www.ascc.gov.au/NR/rdonlyres/AC17BA49-8BA1-43B8-BC08-219DE53781E6/0/ASCCReviewOHSImplicationsNanotechnology2006.pdf>>.

20 DEST, *National Industry Skills Report*, May 2006, p. 8.

Science and manufacturing

- 6.21 The National Manufacturing Summit noted in December 2005 that research, development and innovation skills 'are critical for the future growth and development of Australia's manufacturing sector.'²¹
- 6.22 Attracting and retaining people with science skills was similarly identified by Science Industry Australia (SIA) as a key challenge for the innovation industry, which is heavily reliant on human capital to create and maintain its competitive global advantage.
- 6.23 While Australia cannot feasibly keep up with the 600 000 engineers that China reports it graduates each year, or the 'PhD factories' of India, there is yet to be a concerted and serious response to up-skilling the pool of Australia's scientific expertise.²²
- 6.24 A May 2007 report by the Australian Centre for Education Research found that there is a 'crisis' in science education in Australia. Australian students are registering low and decreasing levels of interest in science, in part, because it is not presented as relevant to their lives. Students also have little understanding of what a career in science could hold for them:
- The dominant mode of school and tertiary science has somehow got out of kilter with the needs and interests of contemporary society and contemporary youth.²³
- 6.25 AATSE noted that substandard science teaching at school has a flow on effect for future Australian students and teachers, as well as industry:
- Science literacy in primary schools is abysmal and as a consequence kids are not being excited by science. We are getting into a situation where it is becoming a self-perpetuating wheel, because the fewer the kids that are getting interested in science the fewer the good science teachers that we are going to have to teach the next generation.²⁴
- 6.26 The inquiry heard evidence that Australia's edge in fields such as biotechnology is under threat from economies that are investing more heavily in science teaching. Taiwan was cited as an example:

21 National Manufacturing Summit, *Skills for Our Manufacturing Future*, Background Paper, *Exhibit no. 24*, December 2005, p. 11.

22 M Blackman, *the Age*, 'Education Failures Hold China Back,' 28 February 2007.

23 Prof. R Tytler, *Australian Education Review 51, Re-imagining Science Education: Engaging students in science for Australia's future*, 15 May 2007, p. 67.

24 Mr P Laver, AATSE, *Transcript*, 28 August 2006, p. 43.

The [Taiwanese] National Science Council actually sponsors a program on nanotechnology for kids from kindergarten to year 12, so kids in primary school are learning about nanotechnology. We [Australia] cannot get teachers who can teach kids about electricity or gravity, but here are the Taiwanese teaching primary school kids about nanotechnology.²⁵

- 6.27 Senior high school and university enrolments in science courses have dropped. From 1978 to 2002, Year 12 biology enrolments fell from 55 per cent to just over 20 per cent, chemistry enrolments from 30 per cent to 15 per cent, and physics enrolments from 27 per cent to 12 per cent. The number of university students enrolled in physical and materials sciences fell by over 31 per cent between 1989 and 2002.²⁶
- 6.28 SIA observed that science graduates are well-schooled in theory, but have not had adequate practical training:
- Our issue is generally not one of knowledge, because when our people come out of a science degree they have the knowledge, they just don't have the skill.²⁷
- 6.29 A further issue with some graduates and skilled migrants in the science/technology area is their poor English and verbal communication skills, which can serve to make them 'unemployable.'²⁸
- 6.30 There are government initiatives addressing issues around curricula and communications skills. The committee notes that DEST received \$13 million over two years in the 2007-08 Budget to work with states and territories to develop core curricula standards in subjects that include maths, physics, chemistry and biology for Years 11 and 12 and maths and science for Year 10. This follows the recent commitment made by governments at the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) to develop nationally-consistent curricula for English, maths and science. Furthermore, the Government announced \$67 million over four years to continue the Workplace English Language and Literacy Programme in the 2007-08 Budget, to fund organisations to train workers in English language, literacy and numeracy.

25 Mr P Laver, AATSE, *Transcript*, 28 August 2006, p. 43.

26 Prof. R Tytler, Australian Education Review 51, *Re-imagining Science Education: Engaging students in science for Australia's future*, 15 May 2007, p. 13.

27 Dr J Gonis, Science Industry Association (SIA), *Transcript*, 2 March 2007, p. 14.

28 SIA, *Submission no. 7*, p. 8.

Conclusions

- 6.31 The committee concludes that the manufacturing sector is evolving into a complex industry that is not simply concerned with 'making things' but also innovation, research and high-technology. This provides a multitude of employment opportunities for workers of all ages and stages.
- 6.32 These opportunities are balanced with the 'double-edged sword' of a shortage of manufacturing skills at a time when new technologies demand new and improved skill levels, which are more regularly updated.
- 6.33 The committee concludes that skills shortages are being experienced in some areas of manufacturing where skill-sets are transferable to the mining sector. In addition, difficulties in attracting new employees to fill skills shortages in manufacturing are exacerbated by the sector's poor public image—working in manufacturing is not seen as a viable career by many prospective employees. The community perceive it as an unsafe, dirty and diminishing industry that holds little career prospects. Whilst the committee recognises that some industries of this ilk remain, there may be insufficient community awareness of the many manufacturers offering attractive and increasingly interesting working environments.
- 6.34 Targeted, government-initiated communications campaigns are required to address these misconceptions, promoting the opportunities available in the manufacturing sector—for employees with diverse skill levels—and countering claims that the sector is moving offshore and that working environments are unpleasant.
- 6.35 Good quality science education is critical for the future growth and development of Australia's innovation and manufacturing sectors. It is of great concern, therefore, that science education is experiencing a decline in Australia—in terms of secondary and tertiary student uptake, quality of teaching and relevance of curricula.
- 6.36 The committee notes the importance of practical and interesting (not just 'core') primary and secondary curricula that engage students, equip them with up-to-date science and mathematics skills, and encourage the pursuit of science and innovation related careers. However, such curricula must be backed by adequate resources and appropriate teacher training.
- 6.37 The committee heard concerns that the university environment is not vocationally oriented. The committee concluded that the workplace is the best environment in which to learn vocational skills using the knowledge acquired at university. The value of a theoretical and broad-based learning platform at the university level should not be underestimated. It enables graduates to innovatively apply broad knowledge in a practical

environment, rather than merely accepting conventional wisdom. Australia needs science and technology graduates who 'think outside the square'.

Recommendation 13

- 6.38 **The committee recommends that the manufacturing industry, with the support of the Australian Government, develop a coordinated communications strategy for promoting the career opportunities in manufacturing, especially in innovative, knowledge based manufacture.**

Recommendation 14

- 6.39 **The committee recommends that the Ministerial Council on Education, Employment, Training and Youth Affairs consider the necessary resources provision and teacher training needs to introduce updated primary and secondary school science curricula with a focus on practical and up-to-date information about emerging technologies.**

Keeping skilled labour

An exodus from manufacturing to resources?

- 6.40 A strong manufacturing industry in terms of human capital is comprised of a tertiary educated workforce in combination with technicians, trainees and apprentices.
- 6.41 The committee heard anecdotal evidence that valuable skilled labour is being lost to the mining industry where more attractive salaries are being offered. Comparable skill sets in these industries mean that cross-poaching can occur in some areas. The Department of Industry, Tourism and Resources (DITR) noted in their submission that skills shortages in the mining sector for mechanical fitters, electrical tradespeople and

boilermakers could be filled by transfers from manufacturing.²⁹ However, DITR also note that this shift constitutes only a very small proportion of total manufacturing employment.

6.42 There is little evidence that this movement is occurring in the high-tech manufacturing areas, however, at the lower skill levels there has been some movement and the committee's concurrent inquiry into Australia's services export sector heard similar information with respect to the services industry.

6.43 There may be opportunities to attract drought-affected farmers and rural workers to manufacturing in regional areas, as they frequently possess a variety of applicable skills, as TAFE NSW noted:

One of the things we are looking at is the ability to engage people who are coming off the farms ... We are looking at ways in which we can recognise their existing skills and perhaps help them into a qualification which will make them employable ... As you will be well aware, people who work in rural environments are often multiskilled and multitalented.³⁰

An exodus to other sectors?

6.44 Of greater concern is the phenomenon of workers 'going off their tools' and being attracted by higher salaries and better conditions in other industries or sectors, such as engineering, geology or merchant banking.

6.45 This is also evidenced in the loss of teaching expertise, particularly in the Vocational Education and Training (VET) system. Despite some professional loading, the salaries for trained technicians and professionals are far greater in industry than in the education system, making it difficult to gain and retain high quality teaching staff. Dr Julie Wells, director of policy and planning at RMIT University, discussed the issue:

The fact that skills shortages mean people can command quite high salaries in the trades also poses particular problems for training providers, because the salaries that we pay our staff are often not comparable with what they can earn in the industry sector, despite the fact that we will offer industry loadings. It is a double-edged sword, I think, for skills acquisition.³¹

29 Department of Industry, Tourism and Resources, *Submission no. 31*, p. 25.

30 Mr K Fillingham, TAFE NSW, *Transcript*, 14 November 2006, p. 12.

31 Dr J Wells, RMIT University, *Transcript*, 28 August 2006, p. 25.

Demographic pressures

6.46 The manufacturing industry is set to lose an increasing and disproportionate number of retiring workers over the next decade. The industry has a top-heavy structure in terms of age: 15 to 24 year-olds make up 14 per cent of the manufacturing workforce, while 55 to 64 year-olds make up 51 per cent.³²

6.47 When older workers retire as part of the 'baby boomer bubble', labour as well as skills will be lost from the industry if they are not refreshed by younger workers. Mr Manwaring noted some employees had worked in his textiles company for 40 years.³³ This was also noted by Dr Wells:

Our population is ageing and we are having to focus on engaging young people who have perhaps fallen out of the education system and also on the need for workers at the other end to stay in the workforce and reskill and upskill, but we are surrounded by countries where the demographics are reversed.³⁴

6.48 The impact of the bubble bursting could be softened by maintaining older workers, through part time or flexible hours and harnessing their expertise in teaching and mentoring roles.³⁵

6.49 Compensating for the changing demography of the manufacturing workforce should also involve targeting more mature workers (not simply those straight out of high-school), with good salaries and accelerated training.

6.50 Mr Nixon Apple, industry and investment policy advisor with the Australian Council of Trade Unions, had a more positive perspective on the ageing population—as one creating opportunity for younger manufacturers to reposition Australian firms in the global market:

One of the great things about the ageing of the population is that you are going to have a huge turnover in the people who currently own and run small manufacturing businesses in Australia. This generational change offers a huge opportunity.³⁶

32 This 'top-heaviness' is slightly more pronounced than in the total workforce where 15 to 24 year-olds make up 18 per cent and 55 to 64 year-olds make up 47 per cent of the total workforce: National Manufacturing Summit, Background Paper: Skills for our manufacturing future, *Exhibit no. 24*, December 2005, p. 5.

33 Mr B Manwaring, Bruck Textiles, *Transcript*, 8 February 2007, p. 13.

34 Dr J Wells, RMIT University, *Transcript*, 28 August 2006, p. 23.

35 National Manufacturing Summit, Background Paper: Skills for our manufacturing future, December 2005, *Exhibit no. 24*, p. 10.

36 Mr N Apple, Australian Council of Trade Unions, *Transcript 22 November 2006*, p. 15.

Skilled migration

- 6.51 A thorough investigation into increased skilled migration was outside the parameters of the inquiry, and indeed there was little substantive discussion of the issue in evidence presented to the committee. However, it is one possible means of addressing skills shortages in Australian manufacturing.³⁷
- 6.52 Skilled migration is an official component of Australia's migration policy, with both Commonwealth and state programmes in place to attract skilled migrants.
- 6.53 At the Commonwealth level, the skills stream is designed for migrants with 'skills or outstanding abilities that will contribute to the Australian economy'. According to the Department of Immigration and Citizenship:
- In 2005-06 the skill stream represented approximately 68 per cent of the Migration Programme, up from 65 per cent in 2004-05;
 - In 2005-06, the outcome in the State Specific and Regional Migration initiatives was increased by 47 per cent on 2004-05 to 27 490; and
 - The skill stream planning level for 2006-07 is the same as 2005-06.³⁸

Conclusions

- 6.54 The committee believes that strategies to improve careers and skills in the manufacturing industry should address existing workers as well as prospective ones—university educated personnel are indeed a vital component of the industry, but so too are technicians, trainees and apprentices.
- 6.55 It is of concern that the manufacturing sector is losing employees in several key cohorts. While the committee heard evidence that manufacturing workers are being lost to the mining industry, this trend is currently only affecting a small proportion of total manufacturing employment. Of greater concern are the skills that are being lost as the baby boomers, and the generation prior to them, retire. In particular, vocational training skills are being lost in this way and also to the higher salaries offered in industry.

37 The Joint Standing Committee on Migration published a report *Review of Skilled Migration* in 2004.

38 Department of Immigration and Citizenship, *Overview of Skilled Migration to Australia*, as viewed 22 May 2007, <http://www.immi.gov.au/media/fact-sheets/24overview_skilled.htm>.

- 6.56 The committee concludes that creative and adaptive approaches need to be taken to maintain workers and attract new sectors of the workforce to manufacturing. Older workers in particular, should not be cast aside as they reach retirement age. Rather, they should be encouraged to keep a foot in the industry's door, through measures such as flexible working hours and harnessing their skills in teaching or mentoring roles.
- 6.57 Mature workers and ex-farm workers were also identified by the committee as groups that may have compatible skill sets for manufacturing and who could be attracted to the manufacturing industry with good salaries and re-training opportunities.
- 6.58 The committee notes that skilled migration is a significant and growing component of Australia's migration programme. It is also one means of addressing skills shortages in manufacturing, in the short-term, both with respect to undersupplied and lapsed skill areas.

The skills gap

- 6.59 Just as there is a skills shortage within the manufacturing industry, so too is there a 'skills gap'. Existing workers do not necessarily have the right skills to perform the tasks required of them as a result of changing technological demands.³⁹
- 6.60 Many employees in the manufacturing industry have been trained to perform a particular skill or narrow set of competencies. Tailored training is now possible through many state and territory TAFEs and is a good mechanism to fill skill shortages at short notice.
- 6.61 However, this emphasis on job-specific skills means that training and skill-sets are not easily transferable across the industry and exacerbate the notion that manufacturing is a 'dead end' career.
- 6.62 There are also many people employed in the manufacturing sector who have sophisticated skills, despite lacking a formal qualification. Again this limits their mobility in the manufacturing sector. Mr Kimble Fillingham, general manager, TAFE business, TAFE NSW noted:

Many of the people in the manufacturing sector are highly skilled, although they do not have a piece of paper.⁴⁰

39 Australian Chamber of Commerce and Industry (ACCI), *Submission no. 33*, p. 32.

40 Mr K Fillingham, TAFE NSW, *Transcript*, 14 November 2006, p. 12.

- 6.63 One answer to this issue is the development of new paraprofessional qualifications such as associate diplomas which 'reduce training time and enable professional recognition for technicians.'⁴¹
- 6.64 Another answer is 'recognition of prior learning' – an existing government strategy for minimising superfluous training of already-skilled but un-qualified workers, attracting funding and Commonwealth-State partnerships under the February 2006 COAG reform agenda.⁴²
- 6.65 Similarly, the *Skilling the Existing Workforce* project is an Australian Government initiative aimed at skilling the adult population without post-school qualifications. Led by Ai Group, the project is aimed at blending formal and informal learning and tailoring training to the specific adult audience and is currently at the consultation stage, due for completion in 2008.⁴³

Vocational Education and Training – skilling new and older workers

- 6.66 The vocational education and training (VET) sector provides for non-university, post-school learning in technical skills and trades. The Australian Government is solely responsible for funding the higher education sector and has a leadership/funding role for schools and vocational education and training, largely via partnerships between Commonwealth and state governments.
- 6.67 According to DEST's *Annual National Report of the Australian Vocational and Technical Education System 2005*, there is a national network of over 4 000 public and private national registered training providers. Over 1.6 million Australians—from a variety of career stages—participate in VET each year.⁴⁴
- 6.68 The *2004-08 Commonwealth State Agreement for Skilling Australia's Workforce* established government funding and accountability arrangements for the system, which is based upon industry-defined competency standards, assessment guidelines, qualifications and support materials. Addressing skill shortages, especially in traditional trades and emerging industries

41 RMIT University, *Submission no. 5*, p. 5.

42 DEST, *Submission no. 49*, p. 5.

43 DEST, *Submission no. 49*, p. 6.

44 DEST, *Annual National Report of the Australian Vocational and Technical Education System, 2005*, p. 12.

and increasing participation and up-skilling of mature workers are among the priorities of the training system.⁴⁵

- 6.69 As outlined in the DEST Submission, there are a wide range of government training and funding initiatives underway that address (either as a whole or in part) the skills shortage in Australia and career opportunities for those in the manufacturing industry at the school, TAFE and industry level. These include Australian Technical Colleges, Industry Skills Councils, group training schemes, *Backing Australia's Ability*, the *National Skills Shortages Strategy* and February 2006 COAG Agenda.
- 6.70 Under the *Realising their Potential* package, the 2007-08 Budget recently provided \$343 million to DEST over four years for tax-exempt wage top-ups of \$1000 per annum for first and second year apprentices in skills shortage trades and \$206 million over four years to provide first and second year apprentices with \$500 vouchers to reimburse course fees. The Government also announced that it would extend FEE-HELP to full-fee paying students in diploma and advanced diploma courses that are accredited as VET qualifications and provide \$59 million over four years to Registered Training Organisations to partner with industry and local employers to implement fast-track, competency-based apprenticeships.

Developments in the VET system

- 6.71 Employees in the manufacturing sector are trained in a variety of ways, including: on-the-job; on-the-job and via formal in-house training; and a mix of on-the-job, formal in-house-training and general trade training at state or territory TAFE institutions.
- 6.72 Most Australian Apprenticeships are four years duration and in the traditional realm cover areas such as electrical, automotive, engineering and manufacturing. Completion of an apprenticeship or traineeship provides the employee with a trade qualification which is recognised throughout Australia.
- 6.73 There are currently approximately 400 000 apprentices in training in Australia.⁴⁶ According to the National Centre for Vocational Education Research, in the year ending 30 September 2006, commencements of apprenticeships and traineeships increased by one per cent on the

45 DEST, *Annual National Report of the Australian Vocational and Technical Education System*, 2005, pp. 12-13.

46 DEST, *Australian Apprentices*, <<http://www.australianapprentices.gov.au>>, viewed 25 May 2007.

previous year; completions increased by three per cent; and withdrawals increased by three per cent.⁴⁷

- 6.74 Group training schemes were initially introduced for the building and construction trades where volatility in the industry makes it more difficult for an apprentice to be maintained by one employer for the life of their apprenticeship. This approach was later rolled out into other trade environments including manufacturing trades.
- 6.75 There are in excess of 150 group training organisations operating throughout Australia. Apprentices and trainees are employed by a group training organisation which receives government funding and payments from host employers.⁴⁸ The group training provider ensures an apprentice undertakes a trade course and is placed in a host environment conducive to learning the trade. In many cases the apprentice will be placed with one host employer for the length of their apprenticeship. Should a host be unable to support the apprentice's work, or where they have a narrow industry field, the group employer provides the opportunity for the apprentice to complete their full apprenticeship with other host employers. Such arrangements are most called for in small-scale manufacturing environments.
- 6.76 The importance of collaboration between TAFE and group training providers was noted by a committee member at an inquiry hearing:
- I know the value of industry focused local solutions and local collaborations of TAFE and group training companies, supported by industry...⁴⁹
- 6.77 State and territory TAFEs are the traditional link between manufacturers and employee training schemes. However, the relationship between TAFEs and employees is now in a state of flux—some apprenticeship training may now be delivered entirely in the work place, with involvement from TAFE, and tailored to meet the needs of employers.
- 6.78 During site visits, the committee heard of the difficulties some apprentices have in accessing appropriate training at a nearby TAFE—needing to

47 National Centre for Vocational Education Research, *Apprentices and trainees – September quarter 2006, Summary*, viewed 22 May 2007, <<http://www.ncver.edu.au/statistics/aats/quarter/sept2006/highlights.html>>.

48 Matched government funding under the Joint Group Training programme is only available to group training organisations that meet the *National Standards for Group Training Organisations*. The scheme totals approximately \$20 million per year.

49 Ms S Grierson MP, *Transcript*, 29 August 2006, p. 5.

travel long distances (from regional to metropolitan areas), due in part to a lack of teaching resources in specific subject areas.⁵⁰

- 6.79 The traditional apprenticeship is also facing the challenge of Generation Y career needs/wants. That is, to keep pace with changing technology and to be more flexible in terms of commitment to a particular job or workplace. In light of this, the four year apprenticeship period is too long, locking the worker into a lower pay scale for a set period, and can also act as a deterrent for mature (existing) workers to become trade skilled. The Australian Chamber of Commerce and Industry noted:

They [Generation Y] do not necessarily expect to remain in the one occupation or with the one employer for extended periods of time.⁵¹

- 6.80 A further challenge for education providers is the high level of sophistication needed in terms of training equipment—often beyond the funding constraints of TAFEs.
- 6.81 TAFE NSW has devised a practical solution to this equipment/training issue, wherein a number of TAFE institutes have formed working relationships with industry to provide in-house training in manufacturing workplaces. One example of this was the partnership formed with precision manufacturing company Broens Pty Ltd. TAFE teachers utilise Broens' advanced, costly machinery to tailor workplace-specific training for its trade course. These arrangements mean trainers are kept up-to-date with the latest equipment and ensure that elementary trade skills, as well as job-specific skills are maintained.⁵²
- 6.82 TAFE NSW is successfully working with industry in this way across a number of regional institutions. It is a model that could be further developed in TAFE institutions nationally.

The role of industry

- 6.83 A common criticism from industry is that vocational training systems are out of date, too slow and not tailored to the skills required in the workplace. As a corollary of this, there is a reported reluctance in some industry sectors to take on apprentices or lower-skilled workers, because industry may not realise the benefits quickly enough, or at all—if

50 For example, toolmaking is now only offered at one TAFE NSW campus.

51 ACCI, *Submission no. 33*, p. 34.

52 Mr K Fillingham, TAFE NSW, *Transcript*, 14 November 2006, pp. 4-5.

employees change jobs. This has obvious implications for the skill levels of an industry in need of skilled employees.

- 6.84 A recent article in the *Australian* detailed the perils of training and upskilling employees with the example of SJ Cheesman, a small-scale engineering parts manufacturer in Port Pirie, South Australia. The company employed six former abattoir workers and trained them in health, safety, metal grinding and oxygen torches. After six months, four workers left. Managing director, Mr Richter noted:

Other bastards have come along and poached them.⁵³

- 6.85 Evidence presented to the inquiry suggested that information about apprenticeships and the VET system can be so complex as to discourage potential employers making use of these resources.⁵⁴

- 6.86 There was also a reported reluctance in industry to train existing employees. Given the shortage of workers, downtime for training was not seen as practicable, as Mr Manwaring argued:

Investment in training is just as important as investment in machinery or new products. If you look at tax regimes, a 125 per cent tax deduction for R&D is all well and good but if you are not investing in people, R&D is not going to do anything.⁵⁵

- 6.87 Flexibility in terms of course schedules, and components of courses (i.e. cherry-picking) was seen as the key to attracting employers.

- 6.88 Several witnesses to the inquiry noted that overcoming the skills shortage would require active participation and commitment from industry, educators and individuals in 'three-way partnerships'—where industry actively informs the subject matter of VET, to ensure the relevance of the training.⁵⁶ Mr Fillingham from TAFE NSW noted:

I think we need some way to encourage the manufacturing industry in particular and industry in general to want to take on people and to engage in training of their existing workforce as well as their new entrants.⁵⁷

- 6.89 Despite criticisms of the current apprenticeship and trainee system survey research suggests that existing arrangements are working for many employers. A 2005 National Centre for Vocational Education Research

53 A Trounson, 'Manufacturers become Miners', *the Australian*, 27 January 2007, p. 34.

54 ACCI, *Submission no. 33*, p. 34.

55 Mr B Manwaring, Bruck Textiles, Pty Ltd, *Transcript*, 8 February 2007, p. 13.

56 Mr K Fillingham, TAFE NSW, *Transcript*, 14 November 2006, p. 13.

57 Mr K Fillingham, TAFE NSW, *Transcript*, 14 November 2006, p. 13.

report on employers' (not exclusively in the manufacturing sector) use of the VET system found that 57 per cent of surveyed employers' had had some engagement with the system in the previous twelve months. Of those:

- 79 per cent of employers with apprentices or trainees were satisfied; and
- 80 per cent of employers using other nationally recognised training were satisfied.⁵⁸

Schools and VET

- 6.90 Beyond public relations campaigns about the value of a manufacturing career, practical options and incentives are available to interest and train school students in a vocation whilst they are still at school. RMIT described the 'taster' programmes they conducted for Year 10 school students, to bring them on campus and demonstrate training they may want to undertake.⁵⁹
- 6.91 The Australian Government's *Adopt a School Programme* encourages local businesses to form mentor-type partnerships with schools in their area, providing advice on VET and apprenticeships. On a site visit, the committee encountered the scheme operating successfully with Inbye Mining Company in the Hunter Region of NSW.
- 6.92 TAFE NSW is brokering partnerships between industries and communities to facilitate creative training opportunities, such as a recent successful 'T3' programme in Sydney where Year 12 students spent half a day a week at TAFE, one day at a Toyota dealership and the rest on their school studies. Forty nine of the 52 students enrolled completed the programme and their Higher School Certificate.⁶⁰
- 6.93 According to the DEST, over 90 per cent of Australian high schools have some form of vocational training available to students, via VET in schools courses or Australian School-based Apprenticeships.⁶¹ These arrangements allow students to complete the highest level of secondary education whilst undertaking some vocational education. This may occur in specialist trade schools; in block release with TAFE or entirely at TAFE.

58 National Centre for Vocational Education Research, *Employers' use and views of the VET system: Summary 2005*, as viewed 22 May 2007, <<http://www.ncver.edu.au/statistics/surveys/seuv05/seuv05highlights.htm>>.

59 Dr J Wells, RMIT University, *Transcript*, 28 August 2006, p. 21.

60 Mr K Fillingham, TAFE NSW, *Transcript*, 14 November 2006, pp. 8-9.

61 DEST, *Submission no. 49*, p. 8.

- 6.94 The federal government has recently formed 28 Australian Technical Colleges as specific colleges to provide school based VET education. These were designed to overcome skills shortages, particularly in regional areas and have recently received \$84 million over five years for an additional three colleges in the 2007-08 Budget. With the first tranche of colleges only recently opened, it is premature to make an assessment of their impact at this stage.

Universities and manufacturing

- 6.95 As noted above, the change in manufacturing technology has led to a high demand for technically skilled university qualified employees.

- 6.96 This requires a culture shift in perceptions about manufacturing as a career, such that university-educated technicians consider pursuing careers in professions that were once trade-dominated. According to the National Manufacturing Forum, in a perfect world:

Young people [would] see manufacturing as an industry of many and varied career opportunities, good pay and the opportunity to work in the global economy.⁶²

- 6.97 It is interesting to note that the manufacturing sector already has a relatively high intensity of engineers and scientists.⁶³

- 6.98 A number of witnesses to the inquiry backed the Ai Group suggestion that science and engineering undergraduate degrees should be given HECS concessions (as is done for education and nursing degrees) to support students' entry into the manufacturing industry. Science Industry Australia noted:

Designating science and engineering as national priority areas, exempt from HECS fee increases, in a similar way to nursing and education, would assist in encouraging students to take up science and engineering at university.⁶⁴

- 6.99 However, it is not clear how effective this would be in switching students' preferences between degrees, given that HECS does not have to be paid until a certain level of income is reached. It is also questionable on equity grounds as, unlike nurses and teachers, science and engineering graduates are likely to go on to earn high salaries. There is also a risk to the overall

62 National Manufacturing Forum, Report, *Exhibit 22*, October 2006, p. 39, as viewed 16 May 2006, <http://www.business.nsw.gov.au/NR/rdonlyres/4E9FFF98-494A-44AD-BB8E-5D689ED6FD7C/0/NatManuf_forum_Final_report_200610.pdf>.

63 Productivity Commission, *Trends in Australian Manufacturing*, Canberra, August 2003, p. 79.

64 SIA, *Submission no. 7*, p. 8.

integrity of the HECS scheme if various fields of study are successively given concessions.

- 6.100 Away from the traditional degree-domains, dual-sector institutions, such as RMIT are providing industry skills 'through a mix of higher and vocational education'. The key to making such initiatives successful again is flexibility – accommodating working students in night time courses and facilitating accelerated courses, and industry relevance – working closely with industry to develop the training and skills required for the workplace.⁶⁵
- 6.101 To be truly effective, educators, trainers and industry need to think in the long-term, beyond yearly enrolments, to pre-empt industry trends and thus student needs, rather than simply reacting to changes in the workplace as they occur.
- 6.102 In a similar way, any panic about a 'brain drain' of graduates needs to be viewed holistically. The focus should not be on discouraging graduates from working overseas, but attracting them back with their new skills and knowledge, as Dr Wells of RMIT University said:

It is less a matter of a brain drain than a matter of a brain swirl that we are looking at with a globally mobile workforce. We should be less anxious about people moving offshore once they have completed a qualification to work and more concerned with how we draw them back and how we draw talent from offshore to work in Australia.⁶⁶

- 6.103 Furthermore, as the House of Representatives Standing Committee on Science and Innovation noted in their June 2006 report *Pathways to Technological Innovation*, statistical data for years to 2003–04 suggest that 'losses of scientist and engineers through emigration have been offset through net gains through immigration'.⁶⁷

Conclusions

- 6.104 The committee notes the need to up-skill existing employees to address the skills gap created by changing technologies and to enhance career pathways. This necessitates a focus on immobile workers, who do not have opportunity beyond the job they are currently doing. This includes those

65 RMIT University, *Submission no. 5*, p. 5; Dr J Wells, RMIT University, *Transcript*, 28 August 2006, p. 27.

66 Dr J Wells, RMIT University, *Transcript*, 28 August 2006, p. 27.

67 House of Representatives Standing Committee on Science and Innovation, *Pathways to Technical Innovation*, June 2006, p. 78.

who are highly skilled but unqualified and those who have very specific skill sets that are not easily transferable across industry.

- 6.105 The committee therefore endorses the development of paraprofessional qualifications and the recognition of prior learning strategy that reduce training time and give professional recognition to technicians.
- 6.106 VET training is evolving away from the traditional rigid four-year TAFE-based apprenticeship, to more flexible arrangements with schools, and industry employers. This is a much-needed evolution and the committee notes that apprentices and employees alike have expressed dissatisfaction with traditional models, which do not necessarily give apprentices the practical skills and training they require for the workplace.
- 6.107 The committee notes the importance of three-way training partnerships between individuals/schools, educators and industry. The success stories it heard in evidence involved TAFE brokering training partnerships with industry – to harness up-to-date equipment and to gain an understanding of skills that trainees require for the workplace. In addition, group training organisations should be mindful of exposing apprentices to technologically advanced equipment by ensuring a good spread of host employers are involved in the scheme. Training needs to be flexible—in terms of structure and schedule, to attract and maintain students of all ages.
- 6.108 The committee reinforces that industry commitment is a vital to the training of younger (and older workers). Training and development must be seen by industry as a priority even if it is a longer-term investment and temporary drain on resources.
- 6.109 The demand for university-qualified manufacturing workers created discussion about how best to encourage undergraduates into degrees that led to manufacturing careers. A number of witnesses to the inquiry supported the Ai Group suggestion that science, engineering and mathematics-based degrees be granted HECS concessions. However, the committee does not endorse the suggestion as it does not think that HECS is a disincentive (or suitable incentive) to one type of degree over another and could pose a risk to the integrity of the HECS system.
- 6.110 The committee encourages the moves by dual-sector institutions, such as RMIT, to provide a mix of university and vocational education. This is in keeping with calls for flexible, tailored approaches to educating prospective manufacturing workers.
- 6.111 Australia's 'brain drain' needs to be viewed in the long-term, with strategies developed to win expatriate graduates back to the Australian

workforce. It also needs to be viewed in the context of net gains through immigration.

- 6.112 The committee endorses the suite of existing government training and VET initiatives that are addressing manufacturing skills shortages and careers in a variety of contexts—such as the *National Skills Shortages Strategy*. However, with so many different programmes at the Commonwealth and state level, and ad-hoc arrangements between trainers and employees in place, it is difficult to ascertain an accurate overall picture. Further work in this area could focus on comprehensive audits of programmes, skill requirements and areas of genuine need.

Recommendation 15

- 6.113 **The committee recommends that post secondary vocational education providers continue to seek out opportunities to form training partnerships with companies that own costly state-of-the-art equipment—to give apprentices access to the latest technology and maintain the skills of TAFE trainers.**

