Chapter 2

Skill Shortfalls and Future Skill Needs

Introduction

2.1 An important catalyst for this inquiry was industry's concerns about the prevalence and persistence of skill shortages in some key occupations in recent years, as well as growing concerns about the prospect of serious skill shortages and skill gaps in the future arising from the combination of demographic change and new skill needs generated by changes in technology and business processes. Effective responses will require a reliable and comprehensive information base, as well as policy and program frameworks that support investment in a sustainable skills base and short-term responses where appropriate. This chapter will examine evidence on the nature and dimensions of current and projected skill shortages as well as on the adequacy of the information base on current and future skill needs.

Skill shortages and other skill shortfalls

2.2 The term 'skill shortages' is often shorthand for a wide range of recruitment difficulties as well as skill deficiencies of the existing workforce. The Department of Employment and Workplace Relations (DEWR), which monitors skill shortages as part of its labour market information responsibilities, defines skill shortages as occurring when:

> employers are *unable to fill or have considerable difficulty* in filling vacancies for an occupation, or specialised skill needs within that occupation, at prevailing levels of remuneration and conditions of employment, and reasonably accessible location.[1]

2.3 Shortages are monitored for occupations which require significant periods of education and training and or experience (usually of at least three years) generally being in the professions, traditional trades and occupations in information and communications technology. Skill shortage reports also include information on occupations experiencing 'recruitment difficulties'; that is, where employers have *some* difficulty in filling vacancies for an occupation or specialisation within an occupation, even though there may overall be an adequate supply of skilled workers for that occupation.[2] Recruitment difficulties may serve as an indicator of possible

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1 Committee *emphasis.* Submission 95, Department of Employment and Workplace Relations (DEWR), p. 3

2 ibid. Attachment A

future skill shortages, particularly if they persist, although they may also be due to some specific features of positions on offer or reflect highly specialised needs.

2.4 Surveys of skill shortages do not include information on either 'skill gaps', or deficiencies in the skills of *existing* workers or labour shortages, where there are difficulties in recruiting people for less skilled occupations, that is those generally requiring less than 3 years training and/or experience. Yet skill gaps, which imply a need for training of the existing workforce, are of increasing importance for employers in many occupations, and are expected to increase over time due to the ageing of the workforce and the increasing pace of technological change.[3] The need for a sound information base on skill gaps and future skill needs due to technological and workplace change was raised in many submissions.

2.5 This report will consider the full spectrum of skill 'shortfalls' or deficits of concern to industry, including current skill shortages and recruitment difficulties, expected future shortages as well as 'skill gaps'. Labour shortages will be raised where relevant, but have not been a focus of this inquiry.

Dimensions of the problem

2.6 According to the Australian Chamber of Commerce and Industry (ACCI), the lack of suitably qualified staff has been a major concern for Australian industry over the past decade, and is one of the most significant barriers to investment.[4] ACCI reports that while the relative importance of this issue has varied from year to year, peaking in 2000, it has remained in the top 10 of industry concerns since 1992.[5] ACCI does not define 'a lack of suitably qualified people'.

2.7 The Australian Industry Group (AiG), representing employer associations in the manufacturing, construction and engineering industries, reports that several of industry sectors, including manufacturing, are continuing to experience serious skill shortages which, unless effectively addressed, may have severe and lasting consequences for Australian enterprises.[6]

2.8 A study for the Australian Industry Group, *Training to Compete*, identified three dimensions to the skill shortage 'problem': immediate skill shortages; a lack of quality applicants; and, long term skill gaps including an expected long term shortage of people with the required key skills.[7]

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3 National Office of the Information Economy, *Skill Shortages in Australia's IT&T Industries*, Discussion Paper, December 1998, p. 6

4 Submission 100, Australian Chamber of Commerce and Industry (ACCI), p. 7

5 ibid. p. 8

6 Submission 74, Australian Industry Group (AiG) and Engineering Employers Association of South Australia (EESA), p. 10

7 Allen Consulting Group, *Training to Compete: the Training Needs of Industry*, Report to the Australian Industry Group, p. xvii

2.9 The Business Council of Australia submission points to the risk of future broad-based skill shortages resulting from an ageing population, indicating the need for strategies to retain and upskill existing workers and ensure that all young people have the skills that they need to effectively participate in the workforce.[8]

2.10 A study of skill needs in the Hunter region found that knowledge and skills play a major part in the capacity to create long term sustainable jobs growth and that just under a third of Hunter industries believed that skill gaps and shortages will affect their future growth and viability.[9]

2.11 Information from DEWR indicates that skill shortages are currently evident in many child care occupations and the health professions, and are particularly severe for nursing, apply to some specialisations within secondary teaching and ICT, and to many of the traditional trades.[10] Acknowledging that skill shortages may not apply to all specialisations within an occupation or to all locations, the committee notes that some trades occupations have remained consistently in shortage for long periods of time. Trades skills which have been in short supply for a number of years include:

- pastry cooks, chefs and motor vehicle mechanics continuously from 1994;
- toolmakers and upholsterers continuously from 1995;
- boilermakers, fitter and turners, metal machinists, pressure welders and sheet-metal workers in all but one or two years since 1995;
- refrigeration and air-conditioning mechanics continuously from 1998; and
- panel beaters, vehicle painters, and automotive electricians continuously from the end of 1998.[11]

2.12 With the same caveat, in the professions, the occupations or specializations of electrical or electronic engineers, accountants, registered nurses, midwives, mental health nurses, development disability nurses, pharmacists, physiotherapists, speech pathologists, medical imaging professionals, and secondary school teachers (possibly not all disciplines) have been in short supply either continuously or in all but one year, since 1996 (and before, in some cases).[12]

2.13 Submissions and evidence to the inquiry confirmed this general picture, but also reported a large number of other current and projected 'skill shortages' (not

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8 Submission 18, Business Council of Australia, p. 1

9 HunterNet Group Training Company (HNGTC), *Innovative Training Now and in the Future, A Proposal in Response to a Critical Shortage in the Small to Medium Size Engineering and Manufacturing Workforce in the Hunter Region of New South Wales*, February 2003, p. 4

10 DEWR *National and State Skill Shortages List – 2003* at: www/workplace.gov.au/Workplace/WPDisplay/0,1251,a3%3D3507%26a0%3DO%2

11 DEWR *Shortage History Trades Attachment D* (Provided to committee)

12 ibid.

defined in any way). These were often specific to an industry and/or region. For example:

- the submission from TRANZNET identified a current and looming shortage of truck drivers, with the average age of drivers being over 50, partly due to insufficient new entrants over the recent past;[13]
- the Victorian Government identified the likelihood of future shortages in IT, notwithstanding the current downturn in the industry;[14]
- the Recruitment and Consulting Services Association reported that the nursing shortage is by far the most serious, and there is an overall lack of qualified trades people, but there are also difficulties in recruiting people with logistics and supply skills, and legal skills as well as people with building and engineering skills;[15] and
- the Australian Mathematical Sciences Institute reports serious problems with the supply of mathematics teachers, and teachers of literacy and numeracy for young people at risk of failing at school, and that there are insufficient teachers of mathematics among the core TAFE staff.[16]

2.14 These 'shortages' may not be captured by DEWR reporting, either because they are specific to a region, are not sufficiently 'skilled' to meet DEWR's reporting criteria, or have not yet been manifest in difficulties in recruitment through standard channels. They are likely, however, to be of significant interest to industry bodies, policy-makers and educators, because they suggest areas where a response is required.

2.15 The regional dimension to skill shortages is quite marked: a survey of businesses by the Australian Industry Group found that 60 per cent of regional businesses in New South Wales face skill shortages, as well as 48 per cent of businesses in Victoria and 41 per cent of businesses in Queensland.[17] Shortages can be particularly severe in rural or more remote areas. The Pastoralists and Graziers Association of Western Australia reported that 65 per cent of their members find it 'almost impossible to engage suitably skilled staff for either seasonal or permanent positions.'[18]

2.16 The impact of regional skill shortages can be felt beyond the region: there are concerns that shortages of metal and steel trades people are threatening multi-million

13 Submission 30, TRANZNET, p. 2

14 Submission 94, Victorian Government, p. 11

15 Submission 20, Recruitment and Consulting Services Association, p. 5

16 Submission 103, Australian Mathematical Sciences Institute, p. 2

17 Submission 74, AiG and EESA, p. 10

18 Submission 43, Pastoralists and Graziers Association of Western Australia, p. 1

dollar projects in the Upper Spencer Gulf areas of Whyalla, Port Pirie and Port Augusta.[19]

2.17 While skill shortages are said to be 'a recurring and persistent feature of the Australian labour market',[20] their incidence and severity varies over time. DEWR information on skill shortages over the past twenty years indicates that shortages have become more widespread and entrenched since 1994–95. In response to mounting industry concerns about during the second half of the 1990s, the Commonwealth government, commencing in 1999, initiated a number of industry-government (industry-led) working groups to examine skills shortages in selected industries, under the umbrella of the National Industry Skills Initiative (NISI). Working groups established since 1999 cover engineering, electro-technology, retail motor, commercial cookery, building and construction, the rural industries, retail, emerging technologies and road freight transport. General issues relating to skill shortages in the traditional trades, an area of particular concern, were also examined.

2.18 Industry and other participants clearly value the work done through the National Industry Skills Initiative, particularly the better understanding that has been achieved of the trends in supply and demand for skills in selected occupations or industries and the nature and cause of skill shortages. Nevertheless, industry representatives submitted that Australia still lacks an adequate national, 'whole-of-government' framework for responding to skill shortages and future skill needs'.[21]

2.19 The Australian Industry Group also identified the need to forestall future skill shortages through a more strategic approach to skill formation, based on identifying the trades and post-trade skills requirements four or five years into the future, given the time required for skill formation at these levels.[22] A particular concern is the need to identify the full range of skill needs associated with some of the major resource or infrastructure projects planned to come on stream in Central Queensland and Northern and Western Australia over the next few years and to develop national strategies to meet those needs.[23]

Contributing factors

2.20 The causes of skill shortages and skill gaps are often complex and multi-faceted with the specific causes varying with the industry and occupation. National industry advisory bodies identified the following factors as contributing to

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19 Submission 79, TAFE Directors Australia, p. 2

20 Smith A, *Evidence of Skill Shortages in the Engineering Trades*, NCVER, 2002, p. 1

21 Mr Stephen Balzary, Director, Employment and Training, ACCI, *Hansard*, Canberra, 20 June 2003, p. 1114

22 Mr Stephen Ghost, General Manager, Education and Training, AiG, *Hansard,* Sydney, 6 May 2003, p. 794

23 ibid. pp.799–800

current and future skill shortages and skill gaps: an ageing workforce and impending retirement rates; poor image translating into smaller and lower quality pool of applicants; inadequate apprenticeship rates to ensure replacement training; problems in attracting and retaining people; changing employment arrangements increasing the demand for skilled workers or decreasing the supply of skilled workers; and changing skill needs within occupations.[24]

2.21 Cyclical factors can contribute to fluctuations in training and the size of the workforce in many traditional trades, with engineering and construction the prime examples, but can also affect the professions. For example, the decline in ICT course during the current industry downturn is fuelling fears of a shortage in the next three years when demand is projected to increase.[25]

2.22 The seasonal nature of many agricultural industries, and the effect on social security entitlements of casual work, can also contribute to labour shortages in agriculture.[26] This suggests the need for workers who are multi-skilled in a range of seasonal agricultural work, but may also require restructuring of work opportunities. As the Recruitment and Consulting Services Association observed, for some occupations or industries, no training strategy in itself will reduce the gap between the supply and demand for skills: 'In some cases fundamental change of the industry is required to attract people to work in the areas.'[27]

2.23 Attrition rates contribute to shortages in traditional trades where apprentice completion rates average around 70–80 per cent and up to half of all trade qualified work outside their trade occupation. Progression within the industry, as well as dissatisfaction with limited career options, salary, working conditions or the physical demands of the job, and personal reasons, such as care of family may be factors. Uninformed career choices can also contribute to attrition rates, an issue currently of concern to the automotive industry.

2.24 The professions are not immune from skill shortages partly caused by attrition of skilled workers: the number of registered and enrolled nurses outside the nursing workforce represented more than 10 per cent of those in the workforce in 1999,[28] with salaries and working conditions, pressures in the hospital system and work intensification contributing factors.[29] The engineering and medical professions are currently concerned that the rising costs of personal indemnity insurance will drive

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24 Supplementary submission 35, Australian National Training Authority (ANTA), p. 18

25 Chelsey M, 'Fear of Skills Shortage as Students Shun IT', *Australian Financial Review*, 6 September 2003, p. 18

26 Submission 48, Tasmanian Government, p. 6

27 Submission 20, Recruitment and Consulting Services Association, p. 9

28 Senate Community Affairs Committee report, *The Patient Profession: Time for Action – Report on the Inquiry into Nursing*, June 2003, p. 8

29 ibid. p. 22; p. 127

qualified people from the professions, giving rise to, or intensifying, skill shortages in some areas.[30]

2.25 While inadequate training levels are not always the cause of skill shortages, they are often a factor. Skill shortages within the ICT industry in the late 1990s, for example, were partly attributed to inadequate training of existing workers in new technology.[31] There is a growing concern that, despite the decline in employment growth in the traditional trades over the past fifteen years, even steeper declines in the apprenticeship training rates for some occupations are contributing to current and future skill shortages. While Ms Kaye Schofield, an expert witness, submitted that the majority of current skill shortages in Australia are simply manifestations of the normal lags in labour market adjustment and do not point to systemic skill training deficiencies, she considered that the decline in the apprentice training rate in the metal and other manufacturing related trades is alarming evidence of systemic market failure in this industry. Ms Schofield submitted that:

> If the current situation continues in the manufacturing industry, it will have major implications for general industry growth and the sustainability of employment levels in key occupations and even alternative approaches such as skilled migration will be unable to supply the number of skilled people needed by the industry.[32]

2.26 This market failure largely reflects the impact of significant changes to training patterns in the engineering and related trades over the past ten years, discussed further in the following chapter. The major factors are the decline in trades training associated with the privatisation of public utilities and 'mean and lean' strategies of large private enterprises, which previously provided a steady pool of skilled labour for small and medium enterprises. While small and medium enterprises are now being expected to step into the breach, the competitive pressures under which they operate, and current industry structures built around niche specialisations and supply chains,[33] limit their capacity to do so. The longer term effect of a decade of inadequate levels of training of new entrants is now beginning to be felt in the manufacturing and engineering related industries. A report for the Victorian Learning and Employment Skills Commission found that the average age of a Licensed Aircraft Mechanical Engineer is more than 55 years. As it takes seven years to train an aircraft

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30 Submission 32, Institution of Engineers Australia, p. 4; Tobler H, 'Doctors Turn Back on Private Practice', The *Australian*, 16 August 2003; Cronin D, 'Stressed GPs Consider Quitting' Raising Fees', *Canberra Times*, 27 June 2003, p. 1; Rasdien P, 'Doctor Walk-Out Predicted', *West Australian*, 21 March 2003, p. 8

31 National Office of the Information Economy, *Skill Shortages in Australia's IT&T Industries*, Discussion Paper, December 1998, p. 16

32 Submission 96, Ms Kaye Schofield, p. 7

33 National Industry Skills Initiative, *Report of the Engineering Working Group*, p. 12

engineer 'the skills regeneration point has been reached and exceeded' for this industry area.[34]

2.27 The casualisation of the workforce and work intensification has also contributed to the declining investment in the training of existing workers and the erosion of the skills base, a problem which applies across a broad range of industry and occupation sectors from manufacturing[35] to nursing, TAFE and university teachers.

2.28 Compounding this problem, a series of major construction and resource projects will come on stream over the next few years, boosting demand for manufacturing and related trades skills at a time when that skills pool is essentially empty. The AiG argued for a strategic national approach to assess the total demand for skills against the available supply and for accelerated approaches to trades training to fill the gap within the next two years.[36] The committee gained the sense that, if there is not an adequate national response to this issue within the immediate future, skills shortages in mainstream manufacturing will become critical, and undermine the viability of an industry of strategic economic importance.

2.29 Changing social and education trends are also contributing to skills shortages in many of the traditional trades. The National Industry Skills Initiative working groups identified a perceived decline in the size and quality of applicants for apprenticeships at a time when the skill requirements of most trades are increasing significantly.[37] This was perceived to be major factor contributing to current and projected skill shortages. The poor image of the trades, a community and education sector emphasis on higher education, and the demise of technical high schools in many jurisdictions are all blamed for the smaller pool of suitable applicants for apprenticeships. Increasing school retention rates, which result in later entry to the workforce, are also said to make apprenticeships, with their low wages in the early years, less attractive to young people. Proposed solutions include increasing the status of the trades and vocational education and training and improved career advice in schools, as well as a more diverse range of pathways for trades training.

2.30 Strong employment growth can also contribute to skill shortages, and is one of the reasons for the shortages being experienced in occupations associated with child care and aged care.[38] Recruitment practices can also play a role. Shortages of TAFE

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34 Buchanan J, Evesson J, Briggs C, *Reviewing the Capacity for Skills Formation. The Challenge for Victorian Manufacturing*, A Report for the Victorian Learning and Skills Commission, p. 2

35 Submission 24, AMWU, p. 8

36 Mr Stephen Ghost, General Manager, Education and Training, AiG, *Hansard*, Sydney, 6 May 2003, p. 800

37 National Industry Skills Initiative, *Report of the Engineering Working Group*, p. 23

38 NSW Labour Economics Office (DEWR) State Skill Shortage reports, Child care coordinator November 2002

teachers are projected in the near future, at least in some states. The committee was told that approximately 24 per cent of TAFE teachers in NSW are now eligible to retire. With up to 60 per cent of the teaching workforce employed on a casual or contract basis, there many be insufficient experienced teachers to replace retirements.[39]

2.31 Changing skill requirements relating to new technology and work practices are also a major determinant of new skill needs in many industries and occupations and unless met with an effective training response, will contribute to future skill shortages and skill gaps.[40] In the automotive industry, for example, the skill sets have changed significantly over the past ten years, with a significantly increased need for skills in electronics and information technology. Training programs will also need to respond to the need for new skill sets associated with photonics in a wide range of occupations and industries.

2.32 A number of submissions also pointed to the growing need for people 'multi-skilled' in a range of occupational areas. According to GlaxoSmithKline, increased automation within pharmaceutical manufacturing is generating a demand for people with knowledge of electrical systems and IT skills.[41]

2.33 Shortages do not only apply to specific occupational or technical skills. A major issue for the ACCI and AiG is the need to lift the generic or 'employability skills' of the workforce, in response to the demands of a more competitive business environment and greater reliance on technology and complex information. Employer surveys indicate the need for workers of the future to have a greater capacity to adapt to change, promote innovation, solve problems and communicate effectively, and a shortage of people with the required generic skills. Language and literacy skills are also becoming more important for all occupations, and yet a large proportion of the Australian workforce has a 'skill gap' in this area.

2.34 Changes in the nature and composition of skills need to be reflected in changes to the content of training and for new approaches to meeting skill needs of new entrants and existing workers. According to the Western Australian Chamber of Commerce and Industry, globalisation and rapid changes in technology require training programs (including apprenticeships) to be continually re-developed to meet rapidly changing skill requirements, and for a strong focus on upgrading the skills of existing workers.[42]

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39 Submission 19, Ian Cornford, p. 2

40 National Industry Skills Initiative, *Report of the Engineering Working Group*, p. 12

41 Submission 54, GlaxoSmithKline, pp. 5–8

42 Submission 51, Western Australia Chamber of Commerce and Industry, p. 2

Consequences of skill shortages

2.35 There is some debate about whether skill shortages eventually self-correct. While some economic theories suggests that labour markets ultimately adjust to eliminate skill shortages and skill gaps, there are clearly cases where this does not occur without government or other intervention to address the root causes. The shortage of nurses is a clear example. In any case, the long lead time required for skill formation in many of the higher and intermediate skill areas, usually results in a long time lag before supply adjusts to meet demand.

2.36 The consequences of skill shortages can be long lasting and serious. In the short term, enterprises may suffer increased recruitment or operating costs, reduced productivity, and constraints on business development and expansion.[43] In the longer term they may adapt their operations to a lower skills base [44] or occupations or industries or national importance may disappear, and the economy as a whole may follow a 'low skills equilibrium.' In the aged care industry, for example, the shortage of registered nurses is blamed for an increasing use of lower skilled or unqualified people, with potentially adverse consequences for the quality of care.[45] The skilled occupation of 'forging' has apparently disappeared from Australia and the skill of 'toolmaking', critical to many areas of manufacturing, is considered to be 'on the brink.'[46] A study of skills formation in Victorian manufacturing found that unless decisive action is taken soon, a number of key trades necessary for a healthy manufacturing sector will effectively disappear.[47] Similarly, emerging industries may wither and die in their infancy if there is not an adequate skills base to support their growth and development.

2.37 Skills are often an important source of comparative advantage for nations or communities and shortages may inhibit investment. The Northern Territory government has identified the need to address persistent skill shortages in some of the trades in the territory, if investment opportunities are to be realised.[48] Persistent skill shortages in key services such as teaching and health can also affect the long term viability of some communities. Several states and territories have developed or are developing skills strategies to ensure that the composition and distribution of skills meet their economic and social development objectives.

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43 Haskel J and Holt R, Skills Task Force, Research Paper 1, 'Anticipating Future Skill Needs: Can it Be Done? Does it Need to be Done', p. 3; pp. 4–7

44 ibid. p. 9

45 Submission 15, Queensland Nurses Union, p. 2

46 Report of Committee's meeting with Austool representatives, Campbelltown, July 2003

47 Buchanan J, Evesson J, Briggs C, *Reviewing the Capacity for Skills Formation – the Challenge for Victorian Manufacturing,* Report for the Victorian Learning and Employment Skills Commission, p. 6

48 Submission 98, Northern Territory Government, p. 1

2.38 Minimising the incidence and severity of skill shortages, and unemployment resulting from skill mismatches, through improved identification of current and future skill needs and appropriate responses, can therefore have important benefits for enterprises, the economy and society more broadly. This is an appropriate and important role for government.

Identifying current and future skill needs

2.39 Industry, individuals, communities and education and training providers all need access to information on current and future skill needs so that they can make appropriately informed decisions.

2.40 Evidence to the inquiry indicated that, while the quality of Australia's current labour market information is generally high and the development of internet-based career planning information in recent years is a positive feature, there is need for a significantly upgraded information base on current and future skill needs for both VET planning and other purposes. Particular concerns include:

- the outdated nature of the current occupational classification system that underpins labour market and occupational shortage information, limiting the value of such information as a planning tool;
- significant gaps in the information base, particularly concerning skill gaps, the dimensions of skill shortages, regional skill needs and shortages, and the skill needs of emerging industries;
- the need for more qualitative research on the nature of changes to contemporary industry and workplaces and the implications for current and future skill needs;
- the need for a more complete range of indicators for assessing the adequacy of current and future skill supply, going beyond trends in employment growth and job turnover. This may include the need for a more precise analysis of the imbalance between skill supply and demand, sometimes referred to as more sophisticated 'forecasting' approaches;
- the need for a national 'joined up' approach to identifying the skill needs of major resource and infrastructure projects as the basis for a national co-ordinated response;
- a lack of a comprehensive integrated, readily accessible, information base, capable of analysis at industry, regional, state and national level;
- the need for a more strategic approach to identifying current and future skill needs; and
- the need for improved mechanisms for matching job vacancies in a region with people who could fill those positions either immediately, or with some additional training (covered in Chapter 3).

2.41 The common message was that industry, state and territory governments, regional communities and education and training providers do not currently have

ready access to the broad range of information they need for identifying the priorities for current and future skill development.

2.42 The need for a diverse and comprehensive information base reflects the varied dimensions of skill requirements (industry or occupation, location, participation and equity considerations) and the diverse factors influencing skills supply and demand. An NCVER study for the Victorian government on key factors influencing the demand for skills found that:

> …there is no linear pattern to the trajectory of skills requirements in Victoria. There are a number of complex interacting factors at play which determine the requirements for skills. These factors often pull in different directions and may be regarded as forming a *multi-dimensional model* for skills requirements.[49]

Overview of current information

2.43 This section provides a brief overview of current information on skill needs and skill shortages as a basis for considering the criticisms raised during the inquiry and the suggestions for change.

2.44 At the Commonwealth level, agencies are responsible for the collection and distribution of information on current and future skill needs include the Department of Employment and Workplace Relations (DEWR), the Department of Education, Science and Training (DEST), the Department of Health and Aged Care, the National Centre for Vocational Education Research (NCVER) and the Australian National Training Authority (ANTA). State and territory governments and regional bodies also collect a diverse range of labour market information and some public institutes of technical and further education (generally known as TAFEs) also collect information. The lack of integration and coordination of this information was a major concern raised during the inquiry.

Commonwealth agencies

2.45 DEWR has primary responsibility for providing labour market information for widespread use, including trends in occupational demand and skill shortages.[50] The key information products, from the perspective of identifying current and future skill needs, are:

- Job Outlook, which includes information on the job prospects (including occupation and industry trends, earnings, vacancy levels, job turnover, proportion of full-time jobs and age and gender profile) for 400 occupations for

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49 Committee *emphasis*. NCVER, *Building Skills for the Future: Key Factors Influencing the Demand for Skills*, p. 37

50 Mr Denis Hart, Team Leader, Occupational and Skills Analysis Section, DEWR, Hansard, Canberra, 15 August 2003, p. 1235

six years into the future, and is available on-line and in hard copy format. Job Outlook draws on forecasts of trends in employment by industry and occupation prepared by the Centre of Policy Studies (CoPS) at Monash University, adjusted by DEWR to take account of other quantitative and qualitative information on industry and occupation changes provided by employers, recruitment agencies and education and training institutions;[51] and

- national and state-based skill shortage lists, produced annually covering occupations in the trades, professional occupations and ICT fields, based on a Survey of Employers who have recently advertised (SERA) (and other methods for ICT vacancies) and on training commencements and completions data.

2.46 The Job Network system within the EWR portfolio reportedly now has the capacity, with the introduction of vocational profiles, to better match registered unemployed people with available vacancies.

2.47 The Department of Education, Science and Training (DEST), in line with its responsibility for national policy on education and training, provides a detailed range of information on IT skill needs through the IT Skills Hub, has undertaken reviews into nursing and teacher education,[52] and has managed the National Industry Skills Initiative (NISI). For selected industries under the NISI, information on skill supply and demand, and some of the underlying drivers, were provided by DEWR, NCVER and the ABS, and further information was collected where necessary. Participating industries thus acquired a sound basis for understanding the nature, causes, consequences of skill shortages and formulating appropriate responses.

2.48 The Department of Health and Aged Care also collects information on trends in the medical workforce.

2.49 The National Centre for Vocational Education and Research (NCVER) collects and publishes a wide range of statistical information on the Australia's training system including training and completion rates. NCVER also undertakes research on the changing skills of the Australian workforce and the VET sector's capacity to respond to future industry training needs in support of the national training strategy.[53]

2.50 The Australian National Training Authority (ANTA) draws on a wide range of information on current and future skill needs for planning VET resource allocations. Information sources include the forecasts of employment growth by occupation and industry prepared by the Monash University Centre of Policy Studies (CoPS), NCVER research, the annual state and territory annual VET plans, which set out their priorities for skill development, as well as advice from the national industry advisory bodies, which prepare annual industry plans.

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51 Submission 95, Department of Employment and Workplace Relations (DEWR), p. 13; p. 16

52 Submission 57, Department of Education, Science and Technology (DEST), p. 38; p. 8

53 ibid. p. 49

States and territories

2.51 State and territory agencies responsible for VET planning use a range of approaches to identifying the needs and priorities for skill development within their jurisdictions. While some, if not all, take account of occupational and industry employment forecasts based on economic modelling, they generally give more weight to other information, including expert opinion from Industry Training Advisory Boards (ITABs) and other sources, such as regional organisations, on industry needs and trends, and to considerations of national and state and territory priorities.[54] Some examples of the information collected by state governments follow.

2.52 As part of its VET planning process, the Western Australian Government develops forecasts for employment growth by industry, occupation and region and consults with Industry Training Advisory Bodies (ITABs) and other stakeholders throughout the state. It also undertakes analyses of the current and future skill needs of particular industries or projects.[55]

2.53 The Victorian Government reports that it is currently developing more thorough, regular analysis of skill needs and shortages and has begun the design and implementation of a methodical, multi-tiered analytical system to quantify skills shortages and needs.[56] During 2002, it commissioned a number of studies into the demand and supply of skills in Victoria as the basis for its policy statement on skills and innovation. The studies include a detailed analysis of the expected demand for training in Victoria based on projections of employment growth to 2006 by occupation, prepared by the Centre of Policy Studies (CoPS) and the net replacement needs forecasts by Monash University–ACER Centre for Economic of Education and Training. This will provide estimates of net job openings for new entrants by occupation and qualification levels.[57] The Victorian Government also continues to collect information on current and future skill needs through the state Industry Training Advisory Boards (ITABs) and has commissioned specialist studies, such as skills needed to support the new synchrotron. It has also commissioned the IT Skills Hub to develop and maintain an information base on IT industry supply and demand in Victoria as a means of better identifying the changing nature of skill needs in that industry.[58]

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54 Saunders S, Using Training Indicators to Improve Planning for Vocational Education and Training, NCVER 2001, p. 26

55 Submission 39 Western Australian Department of Education and Training, pp. 15–17

56 Submission 94, Victorian Government, p. 9

57 C Shah, M Long *et al, Demand for Training: Labour Force Changes, Projected Job Openings for New Entrants and Workplace Developments,* March 2002, p. xi

58 Submission 94, Victorian Government, p. 32

2.54 The Northern Territory government has commissioned an analysis of the territory's labour market, partly due to concerns about the skill needs associated with a number of major development projects.[59]

2.55 At the local or regional level, local councils or Area Consultative Committees may undertake audits of skill needs and employment trends within their boundaries.[60] For example, in 1999 the Hunter Area Consultative Committee undertook a study of changing skill requirements and skill shortages and gaps, in response to the profound structural changes in the region over recent years. The Hunter Engineering Network and the State Development Department undertook a follow-up study on knowledge intensive manufacturing in the region. These studies provided the basis for a more detailed understanding of the nature and dimensions of skills gaps and shortages, as a guide for corrective action.[61]

2.56 Some institutes of TAFE also undertake some planning and assessment of the skill needs of the local community and the Victorian TAFE Association submitted that TAFE Institutes can contribute to the data collection and analysis process, if there were a consolidated attempt to collect and synthesise that information and they were resourced accordingly.[62] An NCVER study, however, suggested that the information collection arrangements of TAFEs are often *ad hoc* and lacking reliability.[63]

2.57 Local networks such as the Victorian Local Learning and Employment Networks (LLENs) also collect information on the skill needs of their local area. Evidence to the committee indicates that this type of information can be very valuable for local education authorities and employers.

Is the information base adequate?

2.58 The following section will examine the adequacy of the current information base on skill needs, focusing on the specific concerns raised as major issues during the inquiry. The committee observes that a recent paper provided by ANTA

59 Submission 98, Northern Territory Government, p. 4

60 Submission 62, Maribynong/Moonee Valley Local Learning and Employment Network (LLEN), Melbourne's West Area Consultative Committee (ACC) and Western Region Economic Development Corporation (WREDO), p. 4

61 HunterNet Group Training Company (HNGTC), Innovative Training Now and in the Future, A *Proposal in Response to a Critical Shortage in the Small to Medium Size Engineering and Manufacturing Workforce in the Hunter Region of New South Wales*, February 2003, pp. 3–4

62 Submission 61, Victorian TAFE Association, pp. 5–6

63 Shah C, Fischer J, Burke G, *Information on Future Jobs and Skills*, Centre for Economics of Education and Training (CEET), Monash University and ACER, Paper prepared for TAFE Frontiers, August 2001, p. 12

acknowledges the need for improved, early identification of the skill needs of new and emerging occupations, notwithstanding the challenge that this presents.[64]

Information on occupational trends – the 'ASCO' system

2.59 The Australian Standard Classification of Occupations (ASCO) underpins all DEWR's labour market information, including Job Outlook and skill shortage information, and the Australian Bureau of Statistics (ABS) labour force surveys. ASCO is a skill-based, hierarchical system of classifying and grouping jobs comprising a particular set of tasks into occupations organised by skill level and specialisation. The formal education, training or prior experience required for entry to the occupation is used as a proxy for skill level. ASCO uses five skill levels, which are aligned with the qualifications in the Australian Qualifications Framework.

2.60 ASCO was introduced in 1986 and a second edition released in 1996, with the intention of providing a framework for analyzing Australia's occupational labour market for the following ten years.[65] DEWR, in conjunction with the ABS and Statistics New Zealand, is now in the process of revising this edition with the aim of introducing a replacement system, the Australian and New Zealand Standard Classification of Occupations (ANZSCO), in 2006.

2.61 Many submissions from industry and professional associations asserted that many of the classifications in ASCO fail to reflect contemporary skill sets, diminishing the usefulness of much current labour market information, including Job Outlook and DEWR's skill shortages reports.

2.62 The Master Builders Association and the Australian Industry Group (AiG), submitted that the pace of occupational change in the interval between ASCO revisions results in a growing mismatch between ASCO's classifications and contemporary job titles or skill sets.[66] Shortages in skill sets that do not align with current occupational classifications are not captured by current DEWR surveys. Thus, the looming shortage of people with data communications skills is said to be 'hidden underneath the data' because there is no ASCO code for the occupation at present.[67]

2.63 The Engineering Working Group under the NISI found that the ASCO codes and many of the job advertisements for the engineering trades reflect outdated

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64 ANTA Meta-analysis: New approaches to identifying the training needs of new and emerging industries and occupations

65 Submission 95, DEWR, p. 12; Shah C, Long M *et al, Demand for Training: Labour Force Changes, Projected Job Openings for New Entrants and Workplace Developments,* March 2002, p. 51

66 Mr Denis Wilson, National Director Training, Master Builders' Australia, *Hansard,* Canberra, 20 June 2003, p. 1144; Submission 74, AiG and EESA, p. 24

67 Ms Jennifer Callahan, National Electrical and Communications Association (NECA) *Hansard,* Sydney, 7 May 2003, p. 859

occupational titles (such as welder, fitter and boilermaker) rather than the new skill sets and job structures introduced over the last decade as part of fundamental structural reform to the manufacturing industry. This creates 'confusion and difficulties in reporting and interpreting skill shortages.'.[68]

2.64 The lack of an ASCO code for new occupations such as photonics can also means that the demand for these skills is not reflected in standard employment forecasts: the Working Group on Emerging Technologies under the NISI estimated that emerging technologies could lead to the creation of 28,000 new jobs by 2010 and generate the need for new skills sets and changes to generic and existing skills.[69] Employment based forecasts such as those produced by the Centre of Policy Studies, and widely used in Australia for VET planning, cannot capture this trend. A recent study on the demand for training concluded that given current rates of technological and organisational change, a potential delay of ten years in capturing occupational trends may be too long.[70]

2.65 More generally, many current jobs do not conform to standard occupational classifications. The Victorian ITAB Association advised the committee that:

> … what a lot of industry people are telling us is that there are actually other shortages and they are not occupationally based shortages; they are actually skills shortages. They are looking for people, and it may be that they have not got a name for these people yet who are working in offices, but they want a set of skills that does not necessarily match with an occupation. [71]

2.66 The link between skills sets and occupations appears to be becoming more tenuous, with more skill sets transferable across occupations and the skill sets associated with particular occupational titles (such as office manager) varying from employer to employer.[72] There is a growing need to find better ways of defining and measuring skills over time, particularly in occupations experiencing rapid technological or workplace change.[73] One solution suggested in the UK is for studies

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68 National Industry Skills Initiative, *Report of the Engineering Working Group*, p. 14

69 National Industry Skills Initiative, *Emerging Technologies Working Group Report and Action Plan*, September 2002, p. 6

70 Shah C, Long M *et al*, *Demand for Training: Labour Force Changes, Projected Job Openings for New Entrants and Workplace Developments,* March 2002, p. 51

71 Ms Mary Faraone, Executive Director, Business Skills Victoria; and Chair, Victorian Industry Training Advisory Board Association, Hansard, Melbourne, 17 April 2003, p. 679

72 Submission 11, Business Skills Victoria, p. 3

73 Shah C, Fischer J and Burke G, *Information on Future Jobs and Skills*, Monash University – ACER, Centre for the Economics of Education and Training, paper prepared for TAFE Frontiers, August 2001, p. 16

of the tasks and skills underlying occupations as a complement to occupational forecasting.[74]

2.67 ASCO is also said to include insufficient information on skill specialisations, and higher level skills within an occupation, limiting the value of some shortage information.[75] The committee was told that, because there are 90 disciplines in engineering and only eight or nine main engineering categories in ASCO, 'any statistical process to identify skill shortages that is underpinned by ASCO codes is fundamentally inadequate for whatever use'.[76] Manufacturing Learning Victoria also stated that the skill shortages in processing industries identified by DEWR in reality only apply at the advanced skill levels.[77] In recent years, however, DEWR has included more information on specialisations that are in shortage, even where these are not captured by ASCO: for example, they report on the specific cuisines for which there is a shortage of chefs, even though ASCO only records the broad occupation.[78] Nevertheless, the shortage lists may not pick up some smaller specialisations where the occupation as a whole is not in shortage. The complaints raised during this inquiry suggest the need for more consultation with a broad range of stakeholders on the level of detail that they require in terms of skill needs. In addition, information on employment trends based on ASCO will continue to suffer from this lack of requisite detail.

2.68 The Engineering Working Group recommended that a cross industry and government committee be considered to review changes to their occupations and identify the skill sets relevant to industry for the review of ASCO. It also recommended that an interim arrangement be introduced to capture more relevant occupational information on skills shortages in the period before the revised ASCO is released.[79]

2.69 DEWR addressed some of these criticisms in a response to a Question on Notice from the committee. They report that the review of ASCO is considering strategies for updating the classification in the interval between reviews, for information to be captured at the 6 digit occupation level to assist in identifying emerging occupations, and for reporting more information on specialisations. DEWR argues, however, that the ANZCO will not be modified for use in reporting skill gaps,

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74 Haskel J and Holt R, Anticipating Future Skills Needs: Can it Be Done? Does it Need to Be Done? Skills Task Force Research Paper 1, United Kingdom, September 1999, at: www.dfee.gov.uk/skillsforce/papers/1f.htm

75 Submission 74, AiG and EESA, pp. 24–25

76 Mr Athol Yates, Associate Director, Public Policy Unit, Institution of Engineers Australia, *Hansard*, Canberra, 20 June 2003, p. 1144

77 Submission 21, Manufacturing Learning Victoria, p. 1

78 Mr Denis Hart, Team Leader, Occupational and Skills Analysis Section, DEWR, Hansard, Canberra, 15 August 2003, p. 1235

79 National Industry Skills Initiative, *Report of the Engineering Working Group*, p. 34

although it will allow skills to be linked to the occupational structure. DEWR also noted the value of information on higher skill levels but indicated that this needs to be sourced separately and then linked to the ANZCO structure. The committee is pleased that DEWR and the ABS are considering amendments to the classification to address some of the concerns but believes that it must make a commitment to maximising the potential of the revised classification for monitoring current and future skill needs.

Estimating skill shortfalls

2.70 Estimating the *level* of training required for an occupation or area of skill specialisation requires an estimate of net job openings (derived from trends in employment growth, replacement needs and job turnover) for the occupation,[80] as well as other demand stemming from skill shortages (unfilled vacancies), skill gaps (or skill deficiencies of existing workers) and changes in technology and work practices within occupations which generate the need for new skills.[81] There is also a need to determine changes in the *type* of training required, both for new entrants and existing workers.

2.71 Evidence to the inquiry indicated that there are some clear gaps in Australia's information base on skill needs. Particular problems are inadequate information on the nature and dimensions of skill shortages, particularly at the regional level, ready access to a broad range of indicators of supply and demand and underlying drivers, the nature and extent of skill gaps, and the changing nature of skill needs. This section deals with the information on skill shortages and skill gaps.

2.72 As noted, DEWR undertakes an annual review of skill shortages in the professions, trades and information and communications technology fields. Occupations are included in the skill shortage assessment program where some or many of the following indicators apply: strong employment growth; low unemployment; large numbers of vacancies, particularly many hard-to-fill vacancies; upward pressure on earnings; difficulties in finding suitably qualified people; strong demand for new graduates and use of migration to meet skill needs.[82] The Australian Industry Group and Engineering Employers Association of South Australia questions the credibility and validity of these surveys as apparently based on job advertisements and follow up and contacts with employer associations, whereas many vacancies filled by means other than advertisement, especially in specialist occupations and in regional areas.[83]

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80 Shah C, Long M, Burke G, Fischer J, *Demand for Training: Labour Force Changes, Projected Job Openings for New Entrants And Workplace Developments,* March 2002, p. 23

81 ibid. pp. 3–51

82 National Office of the Information Economy, *Skill Shortages in Australia's IT&T Industries,* Discussion Paper, December 1998, p. 9

83 Submission 74, AiG and EESA, p. 24

2.73 Based on the results of those surveys, DEWR produces an annual national and state skill shortages reports. These have begun to identify specialisations in shortage, where relevant by state and territory and also provide an indication of states and territories and affected and distinguish between the less severe 'recruitment difficulties' and the more severe 'skill shortages'. While information provided on the national and state lists is very much in summary form, up to 1500 pages of more detailed information is available at state level, including narrative on the history and nature of the shortage, supply and demand trends, the nature of recruitment difficulties, workforce numbers and other relevant indicators. DEWR does not however quantify the shortages,[84] reflecting a conscious policy stance favouring the use of indicative labour market information, rather than precise quantitative estimates, as discussed further in a later section.

2.74 This is a point of criticism from industry, some segments of which require quantitative estimates to assess the extent of the shortage and to formulate a response. During the NISI examination of commercial cookery, for example, the industry undertook its own numerical analysis of the shortfall of skilled workers[85] This allowed the industry to conclude that, while it experiences entrenched shortages, a solution should be achievable in a reasonable period of time.[86] The Engineering Working Group under the NISI also criticised the skill shortage surveys as not measuring the size of the applicant pool, limiting their value as a tool for understanding the dimensions of a shortage.[87]

2.75 Industry is also critical of the lack of information on skill shortages at the regional level, a defect acknowledged by DEWR.[88] The Engineering Working Group under the NISI noted that the Commonwealth was working with Area Consultative Committees, ITABs and industry to develop a process and procedure for collecting accurate and consistent regional skill shortage information.[89]

2.76 A major concern for many industry and professional groups is the lack of robust information on skill gaps, which are not captured by DEWR skill shortage surveys and often only identified in general form by industry training advisory bodies. The Institution of Engineers observed that the shortage managerial skills among engineers is a major policy issue facing the profession, but this is not apparent from

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84 Mr Ken Douglas, DEWR, *Hansard*, EWRE Committee, Senate Estimates, 3 June 2003, p. 156; p. 166

85 National Industry Skills Initiative, *A Recipe for Change, the Future of Commercial Cookery in Australia*, July 2001, p. 15

86 ibid. p. 16

87 National Industry Skills Initiative, *Report of the Engineering Working Group*, p. 13

88 Mr Scott Matheson, Acting Group Manager, Employment Analysis and Evaluation Group, DEWR, *Hansard*, Canberra 15 August 2003, p.1236; National Industry Skills Initiative, *Report of the Engineering Working Group*, p. 4

89 National Industry Skills Initiative, *Report of the Engineering Working Group*, p. 34

DEWR's skill shortage reports.[90] The inquiry was told by many industry sources that skill gaps, due to changing skill needs, are now a significant determinant of training needs, and, as such, require more rigorous and consistent analysis.

2.77 ANTA advised the committee that it has tasked industry advisory bodies with advising on specific skills (not simply occupations) that are in shortage or which are priorities for development, and the contributing factors such as a change to regulatory requirements or poor training practices.[91] While this information will contribute to a better understanding on skill gaps, from the evidence before the committee it is not apparent that it provides the level of detail that industry requires.

Forecasting future skill needs

2.78 The submission from the AiG called for an improved a national labour market forecasting system that adequately 'predicts' industry needs now and into the future, particularly in emerging industry sectors.[92] However, as noted, Commonwealth agencies have pointed out that they deliberately refrain from trying to 'predict' future skill needs in a precise forecasting sense.

2.79 The Australian National Training Authority (ANTA), in its initial submission, referred to the futility of attempting to predict the nature of future skills needs when new occupations and skill requirements often arise quickly and in ways that cannot easily be foreseen:

> In 1992, it is doubtful that anyone could have predicted the skills required today, particularly in the areas of the emerging technologies. It is even more doubtful that we will know what the skills needs of the nation will be in 2013. However what we can do, and what we have done, is to ensure that the education and training system is as responsive as possible to the changing skill needs of the Australian workforce – that industry knows that if it needs the skills and knowledge, it can turn to the VET sector for a quick response. We cannot predict the future, but we can plan for it.[93]

2.80 In a similar vein the Department of Employment and Workplace Relations (DEWR) stated that:

> This Department contributes substantially to Australia's knowledge base on current and emerging skill shortages across Australia and occupational trends, characteristics and prospects. This approach does not entail the 'prediction' of future skill needs – the Australian and world economies are experiencing rapid evolution in specialised skill needs and such 'prediction' is not prudent. The focus is rather on providing information on prospective

90 Submission 32, Institution of Engineers, Australia, pp. 5–6

91 Submission 35b, ANTA, Attachment A, 'Industry Advice on Future Skill Needs'

92 Submission 74, AiG and EESA, p. 25

93 Submission 35, ANTA, p. 1

> skill needs that will help to guide the response of the employment, education and training markets.[94]

2.81 Predicting future skill needs' embraces two different issues: estimating the expected demand for skills in existing occupations as a measure of training needs; and, identifying the changing nature of skill needs associated with emerging industries and technological and workplace change. Evidence to the inquiry suggested improved approaches to both aspects of forecasting are required.

2.82 ANTA's current approach to estimating the demand for VET can be described as an 'indicative' or 'indicators' approach under which a range of statistical indicators of the supply and demand for skills are considered, including forecasts of employment growth and job openings and skill shortages, and judgements are made on how these will translate into the need for VET.[95] ANTA has recently commissioned a study on the demand for VET over the next ten years to forecast job growth by industry and occupation, along with the demographic profile of the existing workforce, and an estimation of the effect of policy initiatives.[96]

2.83 Qualitative indicators, including advice from industry training advisory bodies on current and future skill needs and state and territory needs and priorities as set out in their annual VET plans, as well as studies of changes in the nature of skills due to workplace and technological change, are also fed into the mix. The weighting given to each of these indicators is not clear, although employment projections appear to play an important role, as discussed in the following chapter.

2.84 Some researchers argue that model-based forecasts of employment growth and job openings are the most useful tool for identifying skill needs because of their capacity to integrate a large amount of data from a range of sources, and generate forecasts for demand for particular occupations (or any other variable) that 'make sense within the forecast development of the economy overall'.[97] These experts argue for employment forecasts to play a major, if not the major role in skills planning, but with further refinements to improve their capacity to incorporate information on supply and generate estimates of skill imbalances.[98] This may be what some witnesses anticipate when they call for more sophisticated forecasting of skill needs.

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94 Submission 95, DEWR, p. 1

95 Burns M and Shanahan M, *Labour Market Models and their Use in Projecting Vocational Education and Training Requirements*, NCVER 2000, p. v

96 Access Economics, *Future Demand for Vocational Education and Training*, Final Draft of 26 May 2003, p. 3

97 Meagher GA and Parmenter B R Centre for Policy Studies and the Impact Project, 'Future Workforce Skills: Projections from the Monash Model', *General Paper* no G–116 March 1996, p. 1; Shah and Burke, April 2003 p. iv

98 ibid. p. 1; Shah C and Burke G, *Future Job Openings: Australia in the Knowledge Economy*, Working Paper No 48, April 2003, p.iv

2.85 Other NCVER research, however, supports the merits of an indicators approach to planning over 'manpower planning' or 'manpower requirements' approaches, under which training programs or supply of training places are used to correct projected imbalances in skill supply and demand. According to the UK Department of Education and Skills (DFES) and a study for the NCVER, fine detail manpower planning has never worked effectively,[99] at least on a broad-scale or national level.

2.86 The committee agrees that the need to take account of regional considerations, such as the mix of skills needed by communities or groups within the community, and the growing importance of technological and workplace change in generating new skill needs, also argue against a over-reliance on employment-based forecasts and similar methodologies for determining current and future skill needs. The relevance of such forecasts can also be limited by outdated underpinning occupational classifications (as discussed in previous sections) and an inability to forecast sharp changes in direction (such as the technology downturn in 2002–03) or take account of factors such as turnover within occupations,[100] which can be an important determinant of skill needs.[101] As well, employment projections for small occupational groups and small populations may be unreliable, due to small sample sizes, but this is 'a problem which would be prevalent in any alternative approach.'[102]

2.87 Despite these caveats, forecasts of employment growth are and should remain an important ingredient in planning for skill needs and are also of keen interest to job seekers or future entrants to the labour market, including students and prospective migrants. The committee therefore supports efforts to improve the accuracy and relevance of these models and considers that this issue could be discussed by stakeholders as part of the development of a national integrated database on skills supply and demand, as recommended later in this chapter.

2.88 While employment growth, job turnover and projected retirements are among the key indicators of skills demand, a range of other indicators, particularly on skills supply trends, are required. The committee notes that ANTA is reviewing the indicators for VET Planning and the NCVER has commissioned several studies into this issue. It also notes that the NISI exercise was instrumental in drawing out the relevant indicators for several industries, at least in terms of assessing the extent and nature and possible causes of skill shortages.

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99 Saunders S, *Using Training Indicators to Improve Planning for Vocational Education and Training*, NCVER, 2001, p. 12 (citing the work of Blandy and Freeland); Skillsbase website: www.skillsbase.dfes.gov.uk/downloads/SKT1.pdf

100 Shah C and Burke G, *Future Job Openings: Australia in the Knowledge Economy*, Working Paper No 48, April 2003, p. iii, p. 10

101 Shah C, Fischer J and Burke G, *Information on Future Jobs and Skills*, Monash University – ACER, Centre for the Economics of Education and Training, paper prepared for TAFE frontiers, August 2001, p. 9

102 Response to Question on Notice: Western Australian Department of Education and Training

2.89 The committee notes that NISI demonstrated that industries and occupations need a broad range of quantitative and qualitative indicators of the supply and demand for skills and the underlying drivers. Commonwealth agencies such as DEWR, DEST, NCVER and ANTA currently collect much of the required information, but it is often not easily accessible to clients, such as industries. Indeed, industry has suggested that one of the main benefits of the NISI exercise was to provide robust information on the indicators and drivers of skill supply and demand – information that was clearly otherwise either unavailable or difficult to access. As well as the indicators developed under the NISI umbrella, there are a range of other indicators that industry may need, according to NCVER studies. These could include trends in employment, training outcomes and enrolments, supplemented by 'derived measures' or comparisons of supply and demand.[103]

2.90 While industry's focus is on the supply and demand for occupational and related skills, from a community perspective, other indicators such on Youth Transition, and the participation of groups such as people with disabilities and Aboriginal and Torres Strait Islanders, can also be important. Indicators of intermediate skills can also provide an insight into Australia's progress towards a high skill workforce,[104] given the apparent correlation between intermediate skills and progress to a knowledge economy.

2.91 Quantitative indicators may need to be supplemented with qualitative information on the changing nature of work and skill sets within key occupations as a basis for identifying new skill needs (and training content) and skill gaps. A study for the Victorian government used a series of case studies of leading edge firms, which are at the forefront of workplace and technological change as a means of identifying the changing skill sets within occupations or industries. They report a similar, multi-faceted approach being adopted by the German government in a bid to identify emerging skill needs.[105] At the national level, analysis of future skill needs is mainly the responsibility of the industry advisory bodies, although ANTA has also commissioned a number of studies on emerging technologies and their implications for training. Links with relevant Cooperative Research Centres will provide another means of enabling skill councils, and through them ANTA, to improve understanding of the changing skill requirements associated with emerging technologies.

2.92 The committee considers that there is a compelling case for the development, collection and regular publication of a broad range of indicators of skills supply and demand, in each main industry and/or occupation. The new national skills councils should play a key role in identifying or formulating the relevant indicators for their sectors, as suggested in the recommendations made at the conclusion of this chapter.

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103 Saunders S, *Using Training Indicators to Improve Planning for Vocational Education and Training*, NCVER, 2001, pp. 46;59

104 Submission 101, Curtain Consulting

105 Shah C, Long M, Burke G, Fischer J, *Demand for Training: Labour Force Changes, Projected Job Openings for New Entrants and Workplace Developments*, March 2002

2.93 The committee also considers that there is a need to supplement statistical information with a range of studies, such as those of leading edge firms, and other analytical approaches, to identify the changing skill needs of industry as a result of technological change, in a more systematic, rigorous and proactive way than appears to have been done to date.

Integration of information

2.94 The need for better integration of information on supply and demand for skills was raised as an important issue by a number of submissions and witnesses. Some of the key points made in submissions on this issue are:

- A joint ACTU-employer training council favours the integration of all relevant Commonwealth and state labour market data, including information on skill shortages, employment, training and demographic change in a way that permits analysis at a national, state or regional level;[106]
- The Institution of Engineers Australia (IEA) recommends the establishment of an independent, government-supported centre for labour market research that could engage citizens, industry, education providers and professional associations in the collection and dissemination of sector-specific labour market information.[107] They also favour an expanded range of analytical approaches including occasional large studies to explore skills shortages in more detail and a map of the scientific skills base to identify the potential for skills shortages to emerge;[108]
- the AiG and the Engineering Employers Association also support the need for a national labour market forecasting system that integrates information from the Commonwealth and states, but suggested that responsibility for the system should lie with ANTA. They indicated the need for a system that enables a better understanding of current and future skill needs, particularly in emerging industries or technologies and a more proactive approach to skill shortages;[109]
- Australian Business Ltd submitted that there is a 'vast range of data gathered on training, employment and business development' which is often not combined and analysed to identify trends around developing local, state and national economic capability and called for greater consistency and integration of data collected through Commonwealth, state and regional consultations with industry;[110] and

106 Ms Jacqueline King, Industrial Officer, ACTU, *Hansard*, Melbourne Roundtable, 16 April 2003, p. 614

107 Submission 32, Institution of Engineers Australia, p. 6

108 ibid. p. 6

109 Submission 74, AiG and EESA, pp. 21–25

110 Submission 40, Australian Business Ltd, p. 22

- The Victorian TAFE association recommended a 'more appropriate and targeted approach to the collection and dissemination of advice on industry training needs.' In their opinion, data needs to be more regionally focused, current and useable, consistent and accessible.[111]

2.95 Mr Stephen Ghost of the AiG advised the committee that there is also a need to have a 'joined-up' process for identifying the skill needs of large-scale resource or infrastructure projects, such as those projected to come on stream in Western Australia, Queensland and the Northern Territory over the next five years. While most state and territory governments are developing strategies to deal with the implications for skills needs within their jurisdictions, there is no adequate mechanism for considering the national or downstream impact of these projects.[112] Given the skills shortages already affecting the manufacturing, construction and engineering trades across most of Australia, there is a significant concern that, without a coordinated national strategy for identifying and meeting the additional skill needs, for example through accelerated training programs and cross-skilling projects, there will be a significant leakage of skilled trades people from metropolitan and regional areas to the high-paying projects, bringing some existing businesses and industries to a standstill.

2.96 As indicated in previous sections, the information that enterprises, industry associations, the VET sector and governments and communities need to identify current and future skill needs is collected by a wide range of Commonwealth and state agencies and is not accessible from a single point. No one publication or agency provides the full set of information that most industries require. The NISI exercise drew some relevant information from various sources together, but only for the selected industries and on a one-off basis.

2.97 The message to the inquiry from a range of sources is that industry and other clients need, at the least, easy access to a broad range of indicators of the trends in demand and supply of skills for major occupations. There is also a need to ensure a more consistent approach to the collection of information at national, state and regional level to enable greater integration. This will require a cooperative approach between a range of Commonwealth or Federal agencies such as DEWR, DEST, ANTA, the Department of Health and Aged Care and NCVER, state and territory governments and regional bodies such as the Area Consultative Committees.

2.98 ANTA told the committee that as part of its role in supporting the national skills councils to undertake a more strategic approach to identifying future skill needs, and following the work of the National Industry Skills Initiative, it will be providing the councils with information on skill needs that it collects (presumably including occupational forecasts) and 'brokering' with other government agencies which have an interest in future skill needs, such as the Department of Industry and DEWR to

111 Submission 61, Victorian TAFE Association, p. 6

112 Mr Stephen Ghost, General Manager, Education and Training, AiG, *Hansard*, Sydney, 6 May 2003, p. 802

identify the full range of factors that will impinge on future skill needs.[113] The role of the councils will not be to undertake research themselves but to provide 'market intelligence' to inform and supplement research from government agencies.

2.99 The committee acknowledges that while this approach will overcome the need for each council to separately undertake information collection or modelling, it does not meet the need for a more comprehensive, integrated, national database of information identified during the inquiry. Given the wide range of stakeholders with an interest in the trends in the labour market and skills supply and demand more generally, the committee considers that a better approach would be for a comprehensive national information database to support the work of the skill councils. The committee agrees, however, that the skills councils should play a major role in advising on the range of indicators that they require for monitoring the trends in skills supply and demand and the underlying drivers of these. The national database should include information on the level and location of the projected demand for skills associated with major resource projects, which may not be apparent from standard models of employment growth.

2.100 The committee observes that a possible model for the distribution of information on indicators of current and future skill needs is the Skillsbase online collection of labour market information, established by the UK Department for Education and Skills (DfES) in 2000.[114] Aimed primarily at those with a professional interest in skill issues, rather than casual users, Skillsbase provides a one-stop shop of comprehensive information on labour market trends, education and skills data as well as narrative and qualitative information including skill surveys and reports on skills needs.

2.101 The committee considers that NCVER would be the most appropriate body for managing a national information database on current and future skill needs.

Final comments

2.102 Finally, the committee notes that, while planning for future skill needs based on projected and changing demand from industry is an essential element of effective VET planning and strategies to forestall skill shortages, investments in skills formation are not simply a matter of identifying and responding to the level and nature of skills required. Governments also need to take a 'leading' role in terms of identifying the priorities for economic and social development and allocating resources in line with both areas of skill demand, and priority areas.

2.103 The committee notes, in this context, that the Victorian Government is developing a new, broadly-based framework to both assess demand and establish

113 Ms Kareena Arthy, Director, Research., Planning and Reporting, ANTA, *Hansard*, Canberra, 15 August 2003, p. 1227

114 Skillsbase website: www.skillsbase.dfes.gov.uk/narrative/narrative.asp

priorities for skills development in Victoria. The framework is expected to help to anticipate VET needs flowing from industry restructuring and redundancies, and will also aim to: ensure that there is a sufficient flow of new and replacement workers to address future skill needs resulting from structural change in the economy and from an ageing workforce; overcome skills gaps and upgrade the skills of the existing workforce to boost productivity and support industry restructuring; address future skill needs in key areas including biotechnology, advanced manufacturing, design, ICT and environmental technologies; address the new skill sets needed for new and emerging industries and for innovation and knowledge creation in industry; and, address the skill needs of priority groups including young people, unemployed and underemployed workers, people with disabilities, Indigenous people and those in disadvantaged communities.

2.104 The framework integrates a comprehensive range of quantitative and qualitative information sources and key relationships, including a research program, which incorporates a range of data and intelligence input and analysis; a strategic planning and priority setting process that includes strong relationships and continuous strategic dialogues with industry, the community and between Government Departments; and a resource allocation process and dialogue with training providers.[115] This framework may be worth investigating for its broader application to VET planning, particularly in relation to the proposed approach to help anticipate VET needs flowing from industry restructuring and redundancies.

2.105 The committee also notes that VET planning will need to take account of the skill needs associated with major resource projects, and believes that the National Industry Skills Forum could play a role in developing a coordinated national response to this.

Recommendation 1

The committee recommends that the Commonwealth, in conjunction with state and territory governments, develops a new, integrated, nationally consistent approach to the collection and reporting of the complete range of statistical information on the labour market and current and future skill needs. This would entail:

- **agreement between all stakeholders on the relevant indicators of skill supply and demand, including underlying drivers, and consistent collection approaches;**
- **inclusion of information on skill shortages and regional labour markets; and**
- **inclusion of information on the skill needs of major resource and construction projects, from the earliest possible stage.**

115 Submission 94, Victorian Government, pp. 9–10

The National Centre for Vocational Education Research (NCVER) should be tasked with:

- **facilitating this process in consultation with relevant Commonwealth agencies, state and territory governments, the Australian National Training Authority (ANTA) and industry, through industry skill councils; and**
- **developing a national database for recording the information and for permitting analysis of key trends, to be accessible to stakeholders and to the general public.**

Updated information should also be continuously available through a website and disseminated in an annual report on the status of skill formation in Australia.

Recommendation 2

The committee recommends that the Commonwealth, in conjunction with states and territories:

- **examines the feasibility of a nationally integrated approach to collecting and reporting information on skill gaps, and for inclusion of such information in the national skills database; and**
- **considers the most appropriate means of incorporating qualitative information on current and future skill needs, including the training needs of emerging industries, and the changing nature of skill needs, in the national database and reports on skill formation.**

Recommendation 3

The committee recommends that DEWR and the ABS, in developing the Australian and New Zealand Classification of Occupations (ANZSCO) in conjunction with Statistics New Zealand, commit to the implementation of strategies that they are considering to:

- **improve ANZSCO's value as a tool for monitoring occupational change and changing skill needs;**
- **update the classifications regularly as occupations change, to capture labour force data at the occupation level;**
- **report on specialisations and higher skill levels within occupations; and**
- **make provision for information on skills to be linked to occupational structure.**

Recommendation 4

In conjunction with the work to be undertaken in recommendation 1, the committee recommends that DEWR, in consultation with industry

representatives, including skill councils, reviews its current approach to assessing skill shortages with the aim of capturing information: on a broader range of vacancies, including vacancies that are not advertised in the print media; on regional skill needs; details of specialisations and the extent or severity of the skill shortages. This skill shortage information should be included in the national database developed by NCVER, and distributed by DEWR.