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**Department of Education,  
Science and Training**

# **Lifelong Learning in Australia**

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## Abbreviations and acronyms

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AAACE	Australian Association for Adult and Community Education
ABS	Australian Bureau of Statistics
ALA	Adult Learning Australia
ANTA	Australian National Training Authority
AV-CC	Australian Vice-Chancellors' Committee
CERI	Centre for Educational Research and Innovation
DETQ	Department of Education and Training, Queensland
DEST	Department of Education, Science and Training
DETYA	Department of Education, Training and Youth Affairs
IALS	International Adult Literacy Survey
ICT	Information and Communications Technologies
NBEET	National Board of Employment, Education and Training
NCVER	National Centre for Vocational Education Research
OECD	Organisation for Economic Cooperation and Development
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VET	Vocational Education and Training

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# Executive Summary

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The lifelong learning policy agenda has four distinguishing features:

- The recognition of both informal and formal learning;
- The importance of self-motivated learning;
- An emphasis on self-funded learning; and
- The idea that participation in learning should be universal (Section 1.1).

The lifelong learning policy agenda is built on assumptions about the importance of skills in the new economy. Almost all industrial sectors are increasingly ‘knowledge-based’ and economic returns are obtained from a range of ‘intangible’ inputs, one of which is workers’ skills. Participation in education and training is increasing and economic rewards are flowing to people with high skills (Section 2.1).

The Australian economy appears to fit the paradigm of the ‘knowledge-based economy’ as defined by the OECD. Australia has experienced growth in industry sectors that are relatively intense in their use of technology or human capital as well as growth in demand for highly skilled workers (Section 2.2).

The Australian education and training system appears well-placed to meet the demand for high skills in the new economy. High-skilled, full-time jobs in Australia are growing fast in aggregate terms (Section 3.1). These jobs are concentrated in fast-growing industries identified with the ‘knowledge-based economy’ (Section 3.2). Australia has high levels of adult participation in both informal and formal education and training. Participation is highest among wage and salary earners, and an increasing amount of work-related external training is financed by individuals rather than employers (Section 3.3). These trends are consistent with the lifelong learning policy agenda that emphasises self-funded, self-motivated participation in both formal and informal learning.

Although overall levels of participation in education and training in Australia are high, there is a widening gap between the participation rates of people with high skills and people with low skills. Australia has experienced strong growth in both high skilled and low skilled employment. As might be expected from the nature of their employment, workers in low skilled jobs receive fewer opportunities and less employer support for participation in training than workers in high skilled jobs. This restricts their opportunities for upward mobility (Section 4.1).

People with low skills face additional disincentives to participation in education and training, particularly if they are unemployed. The people most likely to participate in adult education and training are those who have completed Year 12. People with low skills and the unemployed are less likely to have completed Year 12. Education and training courses undertaken by people who are unemployed are less likely to improve their employment prospects than courses taken by people who were employed previously. Inadequate credit transfer arrangements pose an additional barrier for people who enter university from vocational education courses rather than Year 12 (Section 4.2).

Australia's capacity to achieve higher levels of educational participation may be undermined by the widening socio-economic gap between individuals in highly paid/high-skilled jobs and people in low paid/low-skilled work. As it presently stands, the emphasis the lifelong learning policy agenda places on individuals' co-financing of their own learning contradicts its stress on lifelong learning as a remedy for social exclusion. Given the many factors inhibiting participation in education and training for less-skilled individuals in low-wage jobs, governments could play a greater role in breaking the nexus between low skills and non-participation.

To date, Australia has successfully met the education and training needs of the new economy. Government policies should ensure that Australia's education and training system is sufficiently flexible and responsive to meet future demand for skills, including the need for skills upgrading for those with low or obsolescent skills. (Section 5.1).

Areas of interest to policy-makers in this context include:

- The maintenance of course quality;
- The accessibility of finance for post-secondary education and training;
- The predictability, consistency and transparency of credit transfer and recognition of prior learning procedures;
- The effectiveness of different courses of education and training in improving the employment outcomes of people who are unemployed;
- The utility of incentives for education and training participation for those most likely to suffer educational and labour market disadvantage in the new economy (section 5).

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# 1 Introduction

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Lifelong learning is on the policy agenda of the OECD, UNESCO, the European Union, and many developed and developing countries, including Australia. Since the OECD made its commitment to lifelong learning in 1996, there has been growing interest in lifelong learning in the Australian policy community. The concept of lifelong learning has been mentioned in many national policy statements on education and training in Australia in recent years<sup>1</sup>.

Both the OECD and UNESCO argue that lifelong learning is essential for both economic prosperity and social stability. The rationale for lifelong learning is defined in two key policy documents:

- The OECD report *Lifelong learning for All* (1996) which emphasises the economic rationale for lifelong learning; and
- The UNESCO report *Learning: the Treasure Within* (1996) by Jacques Delors, which emphasises the link between lifelong learning and social stability.

This study discusses the implications of lifelong learning for Australian education and training. The objectives of the research project were to:

- Review the literature on lifelong learning from the policy perspective of Australian education and training;
- Analyse the implications of lifelong learning and identify operational issues for Australian education and training; and
- Identify gaps in research that need to be addressed to make lifelong learning a more realistic and operational policy goal.

Stage One of this research project involved the production of an annotated bibliography of documents that focused on the development and applications of the lifelong learning policy agenda. The annotated bibliography is presented in a separate document. In this second stage of the research project we examine the assumptions behind the lifelong learning policy agenda and discuss the extent to which the lifelong learning policy agenda is relevant to Australia.

The report begins with an analysis of the concept of lifelong learning as it is portrayed in the international and government policy literature. The second chapter discusses the economic rationale for lifelong learning and the extent to which the Australian experience is consistent with the paradigm of the emerging 'knowledge-based economy'. The influence of structural change on the skills composition of the Australian labour market is discussed in Chapter Three. The question of education and training for those with low or obsolescent skills is discussed in Chapter Four. In Chapter Five we discuss the response of the Australian education and training system to possible future changes in the demand for skills.

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<sup>1</sup> International reports include Delors 1996, Dearing 1997, European Union 1995, Fryer 1997, Kennedy 1997, OECD 1996, Secretary of State for Education and Employment-UK 1998. In the Australian context, see ANTA 1998, Crowley 1997, Kemp 1999, MCEETYA 1997, West 1998, Kirby 2000, Commonwealth of Australia 2001, Fitzgerald 2001.

## 2 What is Lifelong learning?

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Lifelong learning is a difficult concept to pin down because it is used by many different people in many different contexts. The following discussion examines the definitions and rationale for lifelong learning offered in the policy literature.

### 2.1 Lifelong learning: commonalities

The literature on lifelong learning spans a wide range of education and training issues, and speaks to many different audiences. Common themes conveyed in government literature—both Australian and international—articulate a new policy framework for considering education and training. This new policy framework has four characteristics which, taken together, transform ‘education and training’ into the concept of ‘lifelong learning’.

#### 2.1.1 Informal learning

The first characteristic of the lifelong learning policy agenda is that it encompasses both formal and non-formal/informal types of education and training.<sup>2</sup> This is a significant point of departure from traditional education and training policy, which has focused on courses leading to formal qualifications. State-mandated educational institutions such as schools, TAFE institutes and universities remain the lynchpins of the formal education and training system, although public funding is now available for community and private providers in the VET sector under certain conditions.

Formal or non-formal employer provided training is subsidised through tax concessions if it relates to skills required in an employee’s current job; however, employer provision of courses which fall outside this category are not only not funded, but are taxed under fringe benefit provisions.

Informal learning and non-formal learning lacking a vocational component are generally not subsidised. Nevertheless, these less visible types of learning can make a significant contribution to the development of knowledge and skills for employment and other areas of adult life (Coffield 2000).

The importance of informal learning for society and personal fulfilment as well as vocational ends is acknowledged in lifelong learning policy statements. For example, the European Lifelong Learning Initiative defines lifelong learning in the following broad (and perhaps rather ambitious) terms:

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<sup>2</sup> The OECD defines formal learning as learning that is achieved through a program of study that is recognised through a qualification; non-formal learning as learning that is achieved through an organised program that is not recognised through a qualification; and informal learning as learning that is achieved outside an organised program (OECD 2002). The latter includes on-the-job training, defined by the Australian Bureau of Statistics to include activities such as: asking questions of co-workers; teaching yourself; being shown how to do your job; and watching others work (ABS Cat. No. 6278.0).

*Lifelong learning is a continuously supportive process which stimulates and empowers individuals to acquire all the knowledge, values, skills and understanding they will require throughout their lifetimes and to apply them with confidence, creativity and enjoyment in all roles, circumstances, and environments.*

Although the lifelong learning policy agenda encompasses informal learning and recognises the social and personal benefits of learning, the data available on education and training emphasises participation in formal courses and the attainment of qualifications. Where non-formal/informal learning is recorded, as in the ABS *Education and Training Experience* survey, it is reported only in relation to work. The availability of data influences the level of policy analysis about lifelong learning both in this report and in other publications. Although the lifelong learning policy agenda recognises the importance of learning for personal or social reasons, the lack of data on these aspects places a constraint on the scope of studies like this one. The analysis in this report therefore emphasises more formal types of learning, work-related informal learning and qualification levels, due to the limitations of the data collections.

## 2.1.2 Self-motivated learning

The second common theme of lifelong learning policy documents is the importance of self-motivated learning. There is a heavy emphasis in the policy literature on the need for individuals to take responsibility for their own learning (eg. OECD 1996, West, 1998). Lifelong learners are not defined by the type of education or training in which they are involved, but by the personal characteristics that lead to such involvement. Australian researchers define the personal characteristics necessary for lifelong learning in the following terms.

*The individuals most likely to participate in learning, either formally or informally throughout their lives, (have) acquired:*

- *The necessary skills and attitudes for learning, especially literacy and numeracy skills;*
- *The confidence to learn, including a sense of engagement with the education and training system; and*
- *Willingness and motivation to learn. (my italics)*

(National Board of Employment, Education and Training 1996:3)

The lifelong learning policy literature emphasises self-motivation in the context of both formal and informal learning. Lifelong learners must have the *motivation* and *capacity* to learn, in any type of setting, with any type of teacher, or simply by themselves.

Although education and training may have economic benefits for individuals, it is recognised that economic incentives alone are not necessarily sufficient to motivate people to engage in education and training. A range of motivational *barriers* need to be identified and addressed in order for some people to participate in education and training. While some of these barriers are economic and can be overcome with financial assistance, many people are deterred from engaging in education and training by social and personal factors.

An Australian survey of participants in adult education courses identified a range of factors motivating people to undertake adult learning, such as:

- To upgrade job skills;
- To start a business;
- To learn about a subject or to extend their knowledge;
- To meet new people;
- To develop self-confidence;
- To get involved in the community; and
- To develop personal skills.

The two most common reasons for participation were to upgrade work skills (26%) and to extend the learner's knowledge of a subject (26%) (AAACE 1995). In a study of VET participants from 'disadvantaged' social groups, Golding and Volkoff (1998) classified participants into four motivational categories: Worker; Jobseeker; Learner; and Contributor.

The lifelong learning policy agenda suggests that governments should encourage people to overcome the range of barriers to engagement in order to gain the economic and social benefits of higher levels of participation in education and training. The *ANTA Marketing Strategy for Skills and Lifelong Learning* explores motivational factors in some depth, acknowledging that a range of factors—economic, personal and social—motivates people to engage in education and training.

An ANTA-commissioned survey of 3,866 people aged 16 years and above grouped respondents into eight market 'segments' on the basis of their attitudes to learning. The eight segments ranged from those most negative about learning ('Forget it' and 'Done with it' groups) to those most positive (the 'Passionate learners' and 'Almost there' groups). However, when asked to identify the positive features of learning, individuals in *every* segment cited personal benefits—such as a sense of achievement, personal growth, the pleasure of learning and interaction with students—more often than reasons related to the acquisition of skills (ANTA 2000a)<sup>3</sup>.

By acknowledging the range of factors that act as both a motivation and barrier to engagement in education and training, lifelong learning policies tend to promote participation in learning *for its own sake* rather than as a means to a specific end (ie. employment). The goal of participation in learning thus appears to be more significant than the reason why. This can be seen as an acknowledgment of the range of factors that motivate people to participate in formal and informal learning other than, or in addition to, instrumental goals. It could also be the outcome of a strategy that does not wish to create inflated expectations about the financial rewards of education and training. Where instrumental factors alone are used to motivate learning, individuals who are encouraged to sacrifice time and money to take part in courses are likely to be disillusioned if they do not obtain the expected

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<sup>3</sup> The existence of non-financial barriers to participation in education and training tends to be overlooked by analysts who assume that individuals will be motivated to invest in education as long as the discounted benefits outweighed the discounted costs. However the continuing gap in education participation rates between people from high SES and low SES backgrounds – in spite of the existence of means-tested financial assistance schemes – indicates the role of non-financial factors in determining people's educational choices. Research confirms that even when university students are equipped with accurate information about the wage returns to particular occupations, they do not make their investment decisions entirely on the basis of economic criteria (see Bosworth and Ford 1985).

financial reward. On the other hand, where an instrumental goal is paramount in an individual's motivation to learn (eg. people who are unemployed), the participant may be justly aggrieved if the course does not lead to employment. Among the vast literature on lifelong learning, there is relatively little examination of the ways in which education and training should meet the legitimate instrumental expectations of people who are disadvantaged in the labour market (exceptions are Eldridge 2001, Sweet 2001, OECD 2000c, Spierings 2001 and Ryan 2000)

### 2.1.3 Self-funded learning

Self-funded learning is the third characteristic of the lifelong learning policy literature. The concept of self-funded learning is linked to the characteristic of self-motivated learning. In recognition of the costs involved in subsidising lifelong involvement in education and training, the lifelong learning policy agenda emphasises the responsibility of individuals to finance their own continuing education and training with minimal support from government. The West report defines a lifelong learner as a person who takes responsibility for their own learning and who is prepared to invest 'time, money and effort' in education or training on a continuous basis (West, 1998:43).

During the 1970s, lifelong learning was on the policy agenda of the OECD under the name 'recurrent education'. The concept of recurrent education proposed that workers should be released from employment to engage in formal education and training. It was envisaged that recurrent education would be paid for through paid leave. By the early 1980s, the term recurrent education had slipped off the international agenda. McKenzie (1998) notes that many of the objectives and strategies associated with recurrent education have reappeared in the policies associated with lifelong learning. One major change however, is the emphasis on self-funded learning.

The lifelong learning policy agenda does not deal explicitly with the issue of employer-financed versus individually-financed education and training. The literature emphasises the partnership between employers, governments and individuals in funding education participation. The UK's individual learning accounts' (now suspended) were intended to encourage individuals and employers to contribute to the cost of training in partnership with government. Under its *Marketing Strategy for skills and lifelong learning* the Australian National Training Authority is developing strategies to encourage employers to invest in education and training as well as strategies to encourage young people to remain in education and training (ANTA 20001).

### 2.1.4 Universal participation

The fourth distinctive feature of the lifelong learning policy literature is a commitment to universal participation in education and training. In advocating 'Lifelong learning *for all*' the OECD argues that universal participation is necessary for meeting the economic demands of the 21<sup>st</sup> century. The concept of universal participation includes both informal and formal learning for all purposes - social, economic and personal. In arguing that universal participation in lifelong learning is necessary for social cohesion in a time of rapid economic and social change, the Delors (1996) report proposes four characteristics of lifelong learners that would be the 'pillars' of a learning society:

- Learning to do (acquiring and applying skills, including life skills);
- Learning to be (promoting creativity and personal fulfilment);
- Learning to know (an approach to learning that is flexible, critical and capable); and
- Learning to live together (exercising tolerance, understanding and mutual respect).

The Delors concept of lifelong learning offers the broadest interpretation of what constitutes 'learning' (ie. developing values such as tolerance, understanding and mutual respect). The OECD defines lifelong learning in terms of being motivated to continue learning throughout life—both formally and informally (OECD 1996). The analysis in this report is based on a more simple definition of a lifelong learner as someone who participates in education or training—both informally and formally—throughout their lifetime.

The lifelong learning policy agenda is much broader in scope than conventional education and training policies. The broad scope of the policy agenda has resulted in a great deal of diversity in the policy applications and directions associated with lifelong learning. In the UK, for example, lifelong learning policies include initiatives for urban renewal whereby funding is provided for informal education and training at the local level<sup>4</sup>. A recent OECD report argues that government intervention to create 'learning regions' or 'learning cities' can contribute to improved regional economic performance (OECD 2001). On the other hand, lifelong learning can be interpreted entirely in economic terms as being important for individual employability. In its most extreme form, this narrow view eschews the need for any government policy intervention in adult education, by assuming that all continuing education and training needs will be met by employers or by individuals as required.

The extent to which a policy analyst adopts a broad or narrow interpretation of lifelong learning is influenced by factors such as budget constraints, value systems and political ideology. In undertaking this analysis, we examine the lifelong learning policy agenda in terms of the principles identified as important in the international policy literature. Whilst acknowledging that no academic project is value-free, we have tried to avoid being captured by the more extreme interpretations of lifelong learning emanating from both ends of the political spectrum. This study also remains within reasonably conventional boundaries in terms of what we mean by 'learning'. Although we recognise that informal learning and the social and personal benefits of learning are part of the lifelong learning policy agenda, our capacity to examine these aspects is limited by the type of data available on education and training.

In summary, the lifelong learning policy agenda endorses the idea that individuals should engage in learning opportunities throughout their lifetime either for personal reasons or for employment. Four distinguishing themes of the lifelong learning policy agenda are:

- The recognition of both informal and formal learning;

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<sup>4</sup> Even the lifelong learning policies of the British government and the European Union have been criticised as too narrow in conception and inadequate to build the foundations of a learning society (Coffield 1996).

- The importance of self-motivated learning;
- An emphasis on self-funded learning; and
- The idea that participation in learning should be universal.

## 2.2 Lifelong learning: the policy rationale

In justifying their policy commitment to lifelong learning, the OECD and UNESCO highlight changes in the world economy caused by new technology, the rate of economic globalisation and rising income inequality (Delors 1996, OECD 1996). These themes are echoed in the Australian policy literature. For example, the ANTA Ministerial Council states ‘Changes in the markets for Australian products and services, industry restructuring and technological change (mean) that people need to upgrade and update their skills throughout their working lives’ (ANTA 1998). The West Review of Higher Education says ‘...developments in technology and the huge expansion of the services sector require that more people receive more education and training...’ (West 1998:44). A recent report (Fitzgerald 2001) commissioned by State and Territory Ministers of Vocational Education and Training argues that investment in Australian skills and innovative capacities now require high priority.

*Competing in the knowledge economy is primarily competition in building intangible capital, and particularly human capital – essentially skills and knowledge and the ability to carry those into work processes and to adapt and innovate (Fitzgerald 2001:1)*

Technological change, particularly in the information and communication technologies (ICT), is seen to be transforming both the nature of work and its output. As a result, the applications of new technology and the employment of highly skilled workers is seen as a key determinant of economic growth. The OECD has embraced lifelong learning as a determinant of long-run growth in a ‘knowledge-based economy’. This is premised on the belief that technology has so changed both *the nature of work* and *the nature of the market* in goods and services that producing educated workers and supporting ‘knowledge-based industries’ is the key to a nation’s economic prosperity. The Delors report for UNESCO argues that people (and nations) who are not lifelong learners (or learning societies) are likely to suffer economic and social exclusion in the future. The UNESCO position is also based on observations about global economic change, although Delors emphasises that education should be valued for its contribution to humanity rather than merely economic purposes.

A workforce with the capacity for lifelong learning is portrayed as essential to the development of a knowledge-based economy. The literature variously argues that workers need to be lifelong learners in order to *develop* new technology, to *apply* new technology and to *re-train* for the new jobs that are created by new technology. A key assumption is that economic growth in a knowledge-based economy is ‘driven’ by workers’ skills, so lifelong learning is portrayed as a policy that will promote economic growth.

The second assumption behind the lifelong learning policy agenda is that lifelong learning will promote social cohesion in a time of upheaval caused by rapid technological change. Delors, for example, expresses concern about the impact of a

widening socio-economic gap between the incomes of the highly educated and the incomes of the less well-educated:

*The major danger is that of a gulf opening up between a minority of people who are capable of finding their way successfully about this new world... and the majority who feel that they are at the mercy of events and have no say in the future of society, with the dangers that entails of a setback to democracy and widespread revolt (Delors 1996).*

Both UNESCO and the OECD have embraced theories about the dramatic impact of technological change on the nature of work. The sources of these assumptions are examined in the next chapter.

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## 3 Lifelong learning and the economy

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The idea that the ‘new economy’ of the 21<sup>st</sup> Century is fundamentally different to the ‘old economy’ of the 20<sup>th</sup> Century, is drawn from a body of literature about the impact of technology on the nature of work—particularly information and communications technology. This literature is built on the observation that the fastest growing sectors of the world economy employ highly skilled workers. The arguments put forward in the literature and its relevance to Australia are discussed below.

### 3.1 Skills and the new economy

Two prominent advocates of the importance of skills in the new economy are North Americans: political economist Robert Reich; and management academic Peter Drucker. Throughout the 1990s, the output of Reich and Drucker fuelled public debate about the dimensions of the ‘new economy’ and the importance of skilled workers within it. A North American economist, Paul Krugman, is also a protagonist in the debate, taking an opposing view to Reich on the role of governments in promoting national economic performance.<sup>5</sup>

The three features most commonly identified with the ‘new economy’ are:

- Productivity growth from new technologies;
- Increased demand for skilled workers; and
- Globalised markets.

Technological innovations have the power to change the world economy because they can transform the basis of production through what Joseph Schumpeter described as ‘gales of creative destruction’. Schwartz (1994) says that the most powerful economic innovations are usually the result of new scientific/ engineering technologies combined with new management technologies. Thus the advent of steam power and innovations in cotton textile production combined with the management strategy of bringing previously dispersed manufacturing operations under one roof underpinned the industrial revolution in Great Britain in the late 18<sup>th</sup> Century (Schwartz 1994). Similarly, innovations in computer technology combined with new management techniques appear to have driven productivity growth in the late 20<sup>th</sup> Century.

Information and communication technologies (ICT) combined with new management technologies appear to contribute to economic productivity because they allow firms to operate more efficiently and create new markets for goods and

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<sup>5</sup> Public debates on the new economy are dominated by Reich, Drucker and Krugman, because these individuals are prominent writers and commentators in the mainstream media. However these high profile protagonists – particularly Reich and Krugman – derive much of their material from the disciplines of economics and political science which have produced more scholarly – albeit less passionate – investigations of the new economy over the past decade (see, for example, Schwartz 1994, or Giddons and Hutton 2000).

services. New technology such as the memory chip has dramatically reduced the cost, speed and volume of transactions, particularly in information intensive industries, like banking, insurance, and finance. McKeon (1999) cites the rapid reduction in the costs of retail banking transactions as an example:

- The cost of an across-the-counter transaction is between \$2.50 and \$3.50;
- An ATM transaction costs between \$1.00 and \$1.50;
- Telebanking transactions cost approximately 50 cents;
- EFTPOS transactions cost between eight cents and 40 cents; and
- Internet banking costs about 12 cents per transaction.

The OECD report *Science, Technology and Industry Scoreboard 1999 Benchmarking Knowledge-based economies* says:

*Information and communication technologies (ICTs) are a pillar of the knowledge-based economy. How countries adopt and master ICT is thus key to their future economic performance' (p9).*

The OECD ranks countries according to ICT expenditures as a percentage of GDP. On this indicator of 'ICT intensity', Australia ranks third, with more than eight per cent of its GDP expended on ICT<sup>6</sup>.

The second feature of the 'knowledge-based economy' is its high demand for skilled workers, generally treated as those with tertiary qualifications. Drucker (1999) argues that 'knowledge-workers' (ie. people with high levels of skill) are emerging as the dominant group of workers in the labour force of developed countries. Skills are defined as one of the 'intangible' inputs to the production of goods and services in a 'knowledge-based economy'. Intangible inputs include human resources, R & D, technology and intellectual property rights, brands, networks with customers and suppliers, and the organisational structure of the workplace. These 'intangibles' are generally viewed as critical to the value-adding process. Reich (1991:84) defines the importance of three types of human resource skills in the production of value-added products:

- The problem-solvers (who put things together in unique ways, eg. Through R & D, or information management, or computer chips);
- The problem-identifiers (who help customers understand their own needs and identify the possibilities for applying customising products); and
- The strategic brokers (who bring these two types of workers together in seeking out new markets).

Reich and Drucker argue that the people with high skills are engaged in the management of ideas and/or knowledge within high-value enterprises. The growth of so-called 'knowledge-workers' has been most noticeable in the services sector, especially in financial and business services. But there is also evidence of the growing importance of knowledge-workers in the more traditional sectors of

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<sup>6</sup> New Zealand (8.6 %) and Sweden (8.3%) spent a higher proportion of GDP on ICT than Australia (8.1%). The United States was fourth with 7.8% and Japan fifth with 7.4 % of GDP expended on ICT in 1997 (OECD 1999 *Science, Technology and Industry Scoreboard 1999 Benchmarking Knowledge-based economies*, OECD Paris: 116)

production. Higgins (1999) points out that seventy per cent of the value of a car is now attributable to knowledge-based elements such as styling, design and software.

A key assertion is that highly-skilled workers are essential to the productivity of the new economy. Reich declares there will only be three types of job in the future: (1) Routine production workers (the old blue-collar workers and routine supervisors); (2) In-person service workers (ie personal carers, solicitors, hospitality and health workers); and (3) Symbolic analytic workers (people who manipulate symbols to solve, identify and broker problems). A full definition of Reich's typology is provided in Appendix A. Reich argues that a nation's stock of symbolic analysts will be a determinant of its economic performance in the global economy.

The idea that large numbers of workers with high skills are necessary to underpin economic growth permeates the OECD economic literature. The OECD report *Science, Technology and Industry Scoreboard 1999 Benchmarking Knowledge-based economies*, ranks countries according to the share of their population aged 25-64 with at least an upper secondary level education. Australia ranks 18<sup>th</sup> out of 26 countries on this scale<sup>7</sup>. The OECD uses a range of other educational indicators to portray performance in the 'knowledge-based economy' such as expenditure on R & D; output of scientific publications; and share of patents. Australia ranks 19<sup>th</sup>, 8<sup>th</sup>, and 16<sup>th</sup> respectively on each of these indicators.

The third feature of the 'knowledge-based economy' is the expansion of global markets for goods and services. Reich argues that the 'high-value' enterprises that characterise the new economy work within global webs and are increasingly international in terms of their production and markets. The international nature of the Internet and the mobility of highly-skilled workers are cited as evidence of an increasingly global economy, where trade in goods and services is less restricted by national boundaries. Reich insists that the route to economic prosperity for nations is to produce and export symbolic analytic services, especially within high technology industries.

The OECD's report *Benchmarking Knowledge-based economies* has developed a range of measures to indicate the extent to which countries are participating in 'global markets'. These indicators are based largely on international flows of trade and investment. Australia is below the OECD average on most of the trade indicators, for example, coming 22<sup>nd</sup> out of 28 countries on its share of manufacturing exports that are in high and medium-high technology industries. However on foreign investment indicators, Australia performs better, in terms of stocks of foreign investment as a share of GDP (4<sup>th</sup>) and shares of foreign affiliates in manufacturing R & D (5<sup>th</sup>).

The OECD's belief in the existence of a 'knowledge-based economy' underpinned by new technology, high skills and globalisation is not universally endorsed. It could be argued that the world economy is constantly transforming itself and that all developed countries have experienced a trend away from the manufacture of goods to the production of services in recent decades. Economists have also noted that productivity growth is not as high as might be expected in the service industries that have experienced massive levels of high-technology investments. This leads to

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<sup>7</sup> The OECD comparisons of countries' skills bases tend to rely on formal qualifications profiles because these data are most readily available. However direct international comparisons of qualifications profiles are not indicators of labour productivity or economic performance.

questions about the extent to which technology is ‘revolutionising’ productivity (see *Economist*, 10 June 2000, 17 June 2000)<sup>8</sup>.

Reich’s view of globalisation and the importance of ‘strategic trade’ is challenged by Krugman (1994) who argues first, that there has been no significant change in the international economy and second, that governments have no obvious role in promoting ‘strategic trade’ in symbolic analytic services. Krugman argues that global markets have existed since the 1840s, when railroads and steamships significantly reduced the cost of transporting commodities. He argues that Britain was more integrated into the world economy in the 19<sup>th</sup> Century than the US will ever be in the 21<sup>st</sup> Century (Krugman 1994:259)<sup>9</sup>.

Krugman is correct in pointing out that global markets are nothing new. Schwartz (1994) describes how the industrial revolution spawned the development of a world economy that reached its peak prior to 1914. He says that as a proportion of total economic activity, global trade did not regain its 1914 levels until roughly 1980. Compared to the 19<sup>th</sup> century, global markets were not a dominant characteristic of the world economy in the 20<sup>th</sup> Century. Between 1914 and 1948, global trade flows diminished and international market forces were relatively weak. In response to the Great Depression, states gained legal and institutional powers to shelter their domestic markets from the international economy. The effect of these controls meant that between 1948 to the mid-1970s, there was – in historical terms – relatively little international movement of capital, industry and people (Schwartz 1994). In the last quarter of the 20<sup>th</sup> Century, the global economy re-emerged with the effect that:

*...The world today is becoming more like the world of the nineteenth century, when international market forces impelled capital movements, trade, and migration, and when states at best coped with the consequences of those market forces and at worst collapsed before them (Schwartz 1994: 5).*

Schwartz associates this change with the emergence of newly industrialised countries and the increasingly global movement of productive and financial capital.

Overall, there is some evidence of changes in the world economy that are consistent with the idea of a ‘new’ global economy that is different from the international economy of the post-war era. Over the past few decades all developed economies have experienced growth in the sectors depicted as ‘services’ at the expense of traditional manufacturing industries. Within the services sector, growth has been strongest in the areas of financial and banking services that employ high numbers of skilled workers (OECD *Employment Outlook 2000*). The labour markets of developed countries have also become more highly skilled. A skill index developed by DEST found that since 1971, there has been a gradual increase in the skills of the Australian workforce (Aungles et al 1993).

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<sup>8</sup> Peter Drucker addresses this issue in part by pointing out that very little is known about how to monitor the productivity of knowledge-workers (Drucker 1999).

<sup>9</sup> Krugman and Reich hold opposing views about the role of government intervention in the international economy that reflect longstanding differences in economic policy circles about the most effective means of creating national wealth. Non-interventionists or “Ricardians” tend to believe in strategies based on *comparative* advantage whereas “Kaldorians” believe that it is possible to obtain a *competitive* advantage through strategic intervention. Although protagonists such as Krugman strongly defend the Ricardian approach (see Krugman 1994, Appendix to Chapter 10) government economic policies invariably contain a combination of both strategies.

There is also evidence that the demand for skilled workers is linked to the application of new technology but it does not necessarily follow that skills are 'driving' economic growth. In a review of literature on the impact of computerisation on the demand for skilled labour in the United States, Lawrence Katz found the rapid rate of relative demand growth for more-skilled workers over the past few decades has been concentrated in the most computer-intensive sectors of the US economy. He also pointed out that there has been strong growth in the relative demand for more skilled workers throughout the twentieth century, and that technological changes, such as electrification and computerisation, appear to have been major factors in this steady growth in the relative demand for skill (Katz 1999).

The apparent link between high levels of education and training and economic growth has led to government policy initiatives to support innovation through increasing investment in postgraduate research and development. The policy framework for sponsoring successful innovation is generally based on high quality education systems; high output of tertiary educated graduates; and high levels of investment in research and development by both government and the private sector (European Commission 2000). In January 2001, the Australian government launched a \$2.9 billion innovation statement, *Backing Australia's Ability* (Commonwealth of Australia 2001) based on the belief that "innovation – developing skills, generating new ideas through research, and turning them into commercial success – is the key to Australia's further prosperity" (Minchin, Alston, Kemp 2001)

Finally, people with lower levels of education are less likely to obtain stable employment. Across all OECD countries, unemployment rates, labour force participation rates and employment/population ratios are worse for people with lower levels of education. In Australia, for example, the unemployment rate for people with less than upper secondary education is 9 per cent compared to 3.3 per cent for people with tertiary qualifications. This is broadly consistent with the OECD average (*OECD Employment Outlook June 2000: 215*).

In summary, the lifelong learning policy agenda is built on assumptions about the importance of skills in the new economy due to productivity growth from new technology; increased demand for skilled workers; and globalisation. Value-adding is believed to be critical for wealth creation and economic returns appear to be going to 'intangible' inputs, one of which is human resources or workers' skills. Skills are considered important for three reasons. First, the goods and services produced by highly skilled workers (symbolic analysts) are considered to be a source of productivity in the industry sectors demonstrating fast economic growth. Second, new technology is transforming the workplace so that an increasing number of workers need to be capable of learning new skills and working in 'information-based' or 'knowledge-based' forms of production. Third, unemployment is higher among people with lower levels of education.

While these arguments do not prove that higher levels of education and training are the motive force of the new economy, they do point to the increasing significance of education and training to economic growth and successful participation in the labour market.

### 3.2 Structural change in the Australian economy

This section examines Australia's performance in terms of the 'knowledge-based economy' as defined by the OECD. The OECD defines a 'knowledge-based industry' as one that is relatively intensive in its use of technology and/or human capital. According to the OECD's 1999 report, *Benchmarking Knowledge-based Economies*, the typical 'knowledge-based' industries (ie. those which make intensive use of technology or human capital) are: Industries that produce high technology products; Communications services; Finance, insurance and other business services; and Community, social and personal services. Australia is ranked third among OECD countries in terms of its rate of growth in 'knowledge-based industries', after Korea (12.5 per cent) and Portugal (6.9 per cent) (see OECD 1999 *Benchmarking Knowledge-based Economies*).

The Australian economy is undergoing structural change as shown in Table 1. Although *Manufacturing* still makes a significant contribution to GDP, it has declined in significance over the past decade. Except for *Construction* and *Mining*, all sectors in the broad category of *Industry* have declined in terms of their share of GDP over the past decade. *Agriculture, forestry and fishing* has also experienced a slight reduction in its share of GDP in spite of growing by 27 per cent.

The *Services* sector is the largest and fastest growing area of the Australian economy, representing 60.2 per cent of GDP. Within this category, the fastest growing sector is *Communication services*, which has grown by an average of 14 per cent per year since 1990. However this growth was from a low base and *Communication services* remains a relatively small sector, contributing only 3.5 per cent of GDP (the same as *Agriculture*). *Property and business services* are more significant, contributing 10.9 per cent of GDP followed by *Finance and insurance services* at 6.9 per cent of GDP. *Wholesale trade* and *retail trade* are also large and growing sectors, each contributing 5.7 per cent to GDP. The *Services* sector broadly defined is a 'residual' sector in the sense that any activity not related primarily to the production of goods is classified as a 'service'. This broad categorisation is not very useful for analytical purposes. The services sector is therefore divided by the OECD into the four sub-categories of *Distributive Services*, *Producer Services*, *Personal Services* and *Social Services*. For definitions of each of these sub-sectors, see Appendix B.

As shown in Table 1, *Distributive Services* and *Producer services* are the largest and fastest growing area of the services sector in Australia contributing a total of 38.4 per cent of GDP in 1998-99. According to the OECD, *Producer services* are at the forefront of the 'knowledge-based economy', because they make extensive use of both ICT and high-skilled workers. Australia is above the OECD average in terms of the percentage of employment in producer services. The only countries with higher levels of employment in this sector than Australia are Canada, Luxembourg, Switzerland and the USA (*OECD Employment Outlook June 2000*). In spite of its small population, Australia has the largest capital market in the region, characterised by its depth and liquidity (Humphry 2002).

The OECD measures the 'knowledge-intensity' of industries with information about R&D expenditure and skill levels, but acknowledges the difficulty of this task, given the limited data available. The problem is that as technology penetrates most forms of production, increasing numbers of industries can be seen as 'knowledge-based'. The OECD's 1999 report *Benchmarking Knowledge-based Economies*, notes that while there are established methods for classifying manufacturing industries

according to technology intensity, ‘capturing the right services sectors to help measure the impact of knowledge has proved more challenging’ (OECD 1999:18).

**Table 1: Industry Gross Value Added and Employment by sector 1990-91 to 1998-99**

SECTOR	GDP					Employment	
	1990-91		1998-99		Growth	May 1999	
	\$m	Share	\$m	Share			(000s)
<b>AGRICULTURE</b>							
<i>Agriculture, forestry and fishing</i>	15,054	3.6%	19,044	3.5%	27%	432.6	5%
<b>INDUSTRY</b>							
Mining	17,598	4.3%	23,873	4.4%	36%	75.8	1%
Manufacturing	64,949	15.7%	73,800	13.5%	14%	1,067.3	12%
Electricity, gas and water supply	12,138	2.9%	13,496	2.5%	11%	66.9	1%
Construction	24,923	6.0%	34,334	6.3%	38%	647.7	7%
<b>SUB-TOTAL</b>	<b>119,608</b>	<b>28.9%</b>	<b>145,503</b>	<b>26.6%</b>	<b>22%</b>	<b>1,858</b>	<b>21%</b>
<b>SERVICES</b>							
<b>Distributive Services</b>							
Wholesale trade	20,966	5.1%	31,226	5.7%	49%	514.0	6%
Retail trade	23,048	5.6%	31,140	5.7%	35%	1,323.1	15%
Transport and storage	23,165	5.6%	31,372	5.7%	35%	416.3	5%
Communication services	8,989	2.2%	18,945	3.5%	111%	155.6	2%
<b>Sub-total</b>	<b>76,168</b>	<b>18.4%</b>	<b>112,683</b>	<b>20.6%</b>	<b>48%</b>	<b>2,409.0</b>	<b>28%</b>
<b>Producer Services</b>							
Finance and insurance	26,955	6.5%	37,696	6.9%	40%	302.4	3%
Property and business services	39,268	9.5%	59,547	10.9%	52%	953.8	11%
<b>Sub-total</b>	<b>66,223</b>	<b>16.0%</b>	<b>97,243</b>	<b>17.8%</b>	<b>47%</b>	<b>1,256.2</b>	<b>14%</b>
<b>Personal Services</b>							
Accom., cafes and restaurants	9,840	2.4%	13,314	2.4%	35%	428.6	5%
Cultural and recreational services	8,424	2.0%	10,544	1.9%	25%	217.2	2%
Personal and other services	10,595	2.6%	12,928	2.4%	22%	329.8	4%
<b>Sub-total</b>	<b>28,859</b>	<b>7.0%</b>	<b>36,786</b>	<b>6.7%</b>	<b>27%</b>	<b>975.6</b>	<b>11%</b>
<b>Social Services</b>							
Government admin. and defence	19,206	4.6%	22,906	4.2%	19%	360.5	4%
Education	21,627	5.2%	26,541	4.9%	23%	624.1	7%
Health and community services	26,707	6.5%	33,092	6.1%	24%	810.9	9%
<b>Sub-total</b>	<b>67,540</b>	<b>16%</b>	<b>82,539</b>	<b>15%</b>	<b>22%</b>	<b>1,795.5</b>	<b>21%</b>
<b>SUB-TOTAL</b>	<b>238,790</b>	<b>57.7%</b>	<b>329,251</b>	<b>60.2%</b>	<b>38%</b>	<b>6,436</b>	<b>73.8%</b>
Ownership of dwellings	40,482	9.8%	52,961	9.7%	31%		
<b>TOTAL</b>	<b>413,934</b>	<b>100%</b>	<b>546,759</b>	<b>100%</b>	<b>32%</b>	<b>8,726.6</b>	<b>100%</b>

Sources: ABS Cat No. 5204.0 Australian National Accounts. ABS Cat. No. 6203. Labour Force Australia

Notes: chain volume measures of industry gross value added

In summary, the OECD acknowledges the difficulty in defining ‘knowledge-based’ sectors of the economy as ever-increasing sectors of production can be classified as ‘knowledge-based’. However if we accept the OECD argument about the

importance of the 'knowledge-based economy', Australia broadly appears to fit the paradigm developed by the OECD. Over the past decade, Australia has in general experienced steady growth in the sectors and industries that the OECD associates with the 'knowledge-based economy', (although its high-technology manufacturing sector remains small). However, manufacturing industries as a whole are less significant in the new economy which is characterised by an expanding services sector. Australia is ranked third out of all OECD countries in terms of its rate of growth in producer services which is identified by the OECD as a key sector in the 'knowledge-based economy'.

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## 4 Lifelong learning and the labour market

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Literature based on the lifelong learning policy agenda suggests that Australia's comparative performance in educational attainment should be a cause for concern because we lag behind other OECD countries in terms of national spending on education as a proportion of GDP, Year 12 completion, proportion of the population with tertiary qualifications, and participation in adult education and training (McKenzie 1998, O'Connell 1999, Business Council of Australia 2001)<sup>10</sup>. Indicators in areas of unemployment and youth joblessness suggest that although employment rates for young adults are above the OECD average, teenage unemployment in Australia is relatively high, the rate of early school leaving is comparatively high and early school leavers in Australia are very disadvantaged in the labour market compared to their better educated peers (Spierings 2001).

The OECD assumes that demand for workers with high levels of skill will continue to grow and that the proportion of the population with tertiary qualifications is an indicator of future economic performance. The former assumption appears relatively safe; the latter, however, is problematic. Research has not so far been able to conclusively demonstrate linkages of this nature.

Will Australia have enough skilled workers to meet its economic needs in the future? The following discussion looks at trends in the skills composition of the Australian workforce, the role of high-skilled jobs in the Australian economy and the level of participation in education and training.

### 4.1 Changes in the skills composition of the Australian workforce

Cully (1999) mapped employment growth by skill level between 1993 and 1999 – a period over which Australia experienced a net employment growth of 17.2 per cent (an average of 2.9 per cent per year). The net employment growth among workers at Skill level 1 over the same period was 25.9 per cent (4.3 per cent per year). Within this category, employment growth among *Professionals* was strongest at 31.5 per cent (an average of 5.25 per cent per year, as shown in Table 2. The share of employment occupied by Skill level 1 has grown from 22.6 per cent in 1993 to 25 per cent of employment in 2000.

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<sup>10</sup> An alternative view is that the proportion of the population at a given education level may be less important than the quality of their education and their opportunities to put it to use.

**Table 2: Changes in employees and employment shares by occupation and skill level Australia 1993 to 1999**

Skill band	Employees			Employment share			
	1993 (000s)	1999 (000s)	Change %	1993 %	1999 %	Change	
1	Managers and administrators	362.9	397.7	9.6	5.7	5.4	
	Professionals	1069.4	1406.1	31.5	16.9	18.9	
	<b>Total</b>	<b>1432.3</b>	<b>1803.8</b>	<b>25.9</b>	<b>22.6</b>	<b>24.3</b>	<b>+1.7</b>
<b>2</b>	<b>Associate Professionals</b>	<b>641.2</b>	<b>740.5</b>	<b>15.5</b>	<b>10.1</b>	<b>10.0</b>	<b>-0.1</b>
3	Tradespersons	836.8	887.5	6.1	13.2	12.0	
	Advanced clerical and service workers	326.5	318.7	-2.4	5.2	4.3	
	<b>Total</b>	<b>1163.3</b>	<b>1206.2</b>	<b>3.7</b>	<b>18.4</b>	<b>16.2</b>	<b>-2.1</b>
4	Intermediate clerical and service workers	1190.1	1385.7	16.4	18.8	18.7	
	Intermediate production and transport workers	600.9	675.1	12.3	9.5	9.1	
	<b>Total</b>	<b>1791</b>	<b>2060.8</b>	<b>15.1</b>	<b>28.3</b>	<b>27.7</b>	<b>-0.5</b>
5	Elementary clerical, sales and service workers	625.7	848	35.5	9.9	11.4	
	Labourers and related workers	684.5	767.4	12.1	10.8	10.3	
	<b>Total</b>	<b>1310.2</b>	<b>1615.4</b>	<b>23.3</b>	<b>20.7</b>	<b>21.8</b>	<b>+1.1</b>
	<b>All employees</b>	<b>6337.9</b>	<b>7426.7</b>	<b>17.2</b>			

Source: Cully Mark 1999 A more or less skilled workforce? Changes in the Occupational composition of Employment 1993 to 1999 *Australian Bulletin of Labour* 25(2) June.

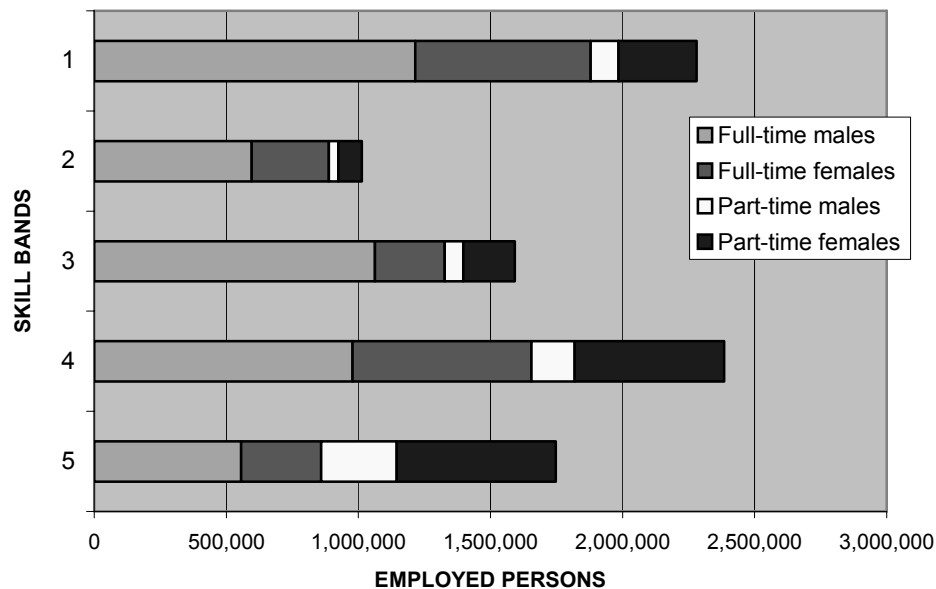
Note: The data relate to all jobs and do not distinguish between full-time and part-time employment.

As shown in Table 2, jobs growth is not confined to the high skilled levels of employment. Net employment growth for *Elementary clerical, sales and service* workers between 1993 and 1999 was 35.5 per cent (Cully 1999). Cully therefore confirmed Gregory's (1993) finding that the changes over the past decade seem to indicate a 'disappearing middle' in the skills composition of the Australian labour force. The highest and lowest skill categories have increased their share of employment at the expense of the three skill bands in the middle.

Although the number of low skilled jobs is increasing, a high proportion of these jobs are part-time, as shown in Figure 1. The following Figure shows the extent of part-time and full-time employment for men and women in each of the five skill bands. A higher proportion of jobs in the lowest two skill categories are part-time and Skill level 5 has the lowest proportion of full-time jobs. Although the number of jobs at this level is smaller than at Level 4, Level 5 is the only category other than

Level 1 to have experienced employment growth over the past decade, specifically in *Elementary clerical, sales and service* workers.

**Figure 1: Part-time and full-time employment by Gender and Skill Level (1-5), Australia, May 2000**



Source: ABS Cat. No. 6203.0 Labour Force Australia May 2000.

The average hours worked by part-time workers is 16.8 hours per week—less than half of a full-time load. The average hours worked by full-time employees is 44.4 hours per week. The Australian Bureau of Statistics reports employment by occupational groups within five bands of skill that are commensurate with educational qualifications and experience. A definition of each Skill Level is provided in Appendix C.

As shown in Table 3, jobs classified as highly skilled (at Skill Level 1) represent 25 per cent of total jobs in Australia and 19 per cent of jobs are in the lowest skill Category 5. But measuring employment shares in terms of total jobs can be misleading because of the different proportions of full-time and part-time jobs in each skill band (see Figure 1). Therefore in terms of total hours worked, Table 3 indicates that the highest proportion of working hours (27 per cent) is spent in jobs at Skill level 1 and only 16 per cent of employment occurs in the lowest skill band.

Given that a high proportion of jobs in Skill band 5 are part-time while jobs in Skill band 1 are predominantly full-time, the employment growth in low-skilled jobs (in terms of hours) must be lower than it appears in the analyses of both Cully and Maglen and Shah (discussed below) as neither of these studies distinguish between part-time and full-time jobs.

**Table 3: Employment by skill level, Australia, May 2000**

Skill level	Occupational Groups	Share of total jobs	Share of total hours worked
1	Managers and Administrators Professionals	25%	27%
2	Associate Professionals	11%	12%
3	Tradespersons and related workers Advanced Clerical and Service workers	18%	19%
4	Intermediate clerical, sales and service workers Intermediate production and transport workers	26%	26%
5	Elementary clerical, sales and service workers Labourers and related workers	19%	16%

ABS Cat. No. 1220.0 Australian Standard Classification of Occupations Second Edition 1997, ABS Cat. No. 6203.0 Labour Force Australia May 2000.

Note: The calculation of shares of total hours worked is based on the ABS reported average for part-time workers of 16.8 hours per week and the average for full-time workers of 44.4 hours per week multiplied by the number of part-time and full-time jobs in each Skill Category.

Some growth in low-skilled jobs is consistent with Reich's thesis. Reich predicted that the provision of 'in-person services' would continue to be a source of jobs growth, within the new economy because the wealth generated by 'symbolic analysts' would be spent on these services. He pointed out that these jobs were insulated from global competition, and were a 'flow-on effect' from trade in symbolic analytic services (Reich 1991).

Maglen and Shah (1998) constructed a nine-way categorisation of Australian occupations based on Reich's typology broken down into three skill bands: high, intermediate and low. They examined the change in employment by each category over the decade 1985-86 to 1995-96. Their findings were similar to those of Cully (1999) and are reproduced in Table 4.

**Table 4: Average annual percentage growth rate in employment by occupational category, 1986/87 to 1995/96**

Reich's categories	Skill bands	Employees 1995/96 (000s)	Employment share 1995/95	Average annual growth rate since 1986/87
Symbolic analytic services	Conceptual	1,236	15%	2.4%
	Technical	168	2%	0.1%
In-person services	Professional	725	9%	2.1%
	Intermediate	722	9%	2.3%
	Elementary	1,444	17%	3.7%
Routine production services	Advanced-skill	1,183	14%	-0.1%
	White-collar	1,006	12%	-0.2%
	Blue-Collar	625	8%	0.4%
	Low-skill	1,178	14%	0.7%
<b>All</b>		<b>8287</b>	<b>100%</b>	<b>1.4%</b>

Source: Maglen Leo and Shah Chandra 1998 *How have jobs in Australia been affected by globalisation and rapid technological change?* Paper presented to Conference Rapid Economic Change and Lifelong Learning August 31 1998, Melbourne

Note: The data relate to all jobs and do not distinguish between full-time and part-time employment.

The Maglen and Shah study spanned a decade of slower overall employment growth of 1.4 per cent per year (as the period included an economic recession). Over the decade, jobs in routine production services declined or stagnated whereas jobs in the high skill band of symbolic analytic services increased by 2.4 per cent per year. The largest increase was in the lowest skill band of in-person services where employment growth averaged 3.7 per cent per year. Maglen and Shah portray these shifts in employment as 'more negative than positive' stating that:

*...All of the stagnation and decline in employment was in the occupational categories most vulnerable to globalisation, technological change and restructuring. On the other hand, only part of the growth, and not necessarily the fastest growing part, was in the occupational category best placed to take advantage of the opportunities these forces opened up. Much of the growth occurred, instead, in those occupational categories not directly open to global forces, and which do not directly add to the competitiveness of the Australian economy. (Maglen and Shah 1998:7).*

This interpretation seems unnecessarily bleak, as the reported growth in the highest skill band of symbolic analytic services was second only to the level of growth in lowest skill band of in-person services. Maglen and Shah also do not take into account the fact that employment in the lower skilled occupational categories is increasingly part-time.

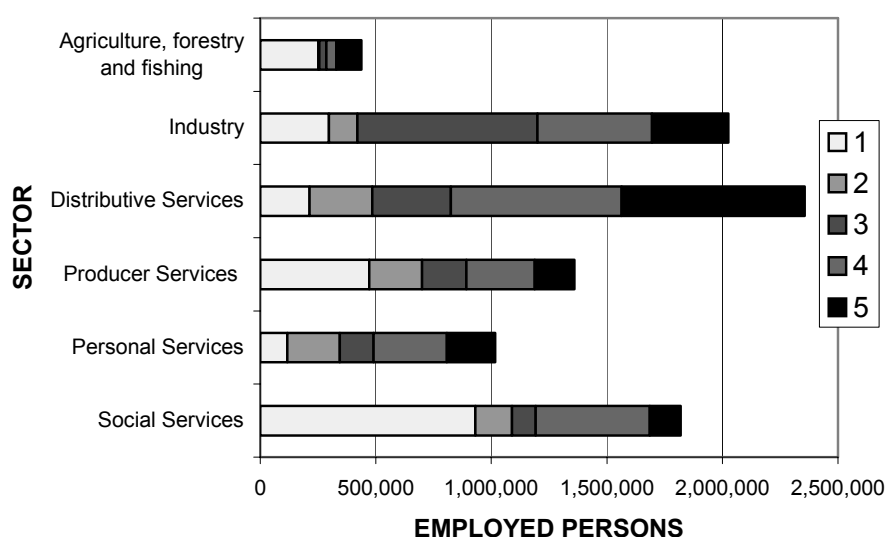
In summary, the Australian economy appears to be experiencing a positive trend towards a more highly qualified workforce. Twenty-five per cent of the Australian workforce is in occupational groups that are classified as highly skilled and employment in high skilled occupations has grown over the past decade. Lower

skilled jobs also occupy a large and growing share of the Australian labour market, but a higher proportion of these jobs are part-time.

## 4.2 Skilled employment in 'knowledge-based industries'

In a 'knowledge-based economy', the fastest growing industry sectors employ large numbers of highly qualified workers. The financial and business services sectors, for example, are intensive in their use of new technology, and employ a large proportion of high-skilled workers. As international trade in these services is increasing, the OECD predicts that countries developing a comparative advantage in this area can expect an expansion in high-waged and highly skilled employment (OECD *Employment Outlook 2000*: 83).

**Figure 2: Skilled Employment by Sector, Australia May 2000**



Source: ABS Cat. No. 6203.0 Labour Force Australia May 2000.

Note: The relatively high number of skilled workers in the Agriculture, Forestry and Fishing sector is due partly to the classification of small farmers as 'managers'. Raw data are provided in the Appendices.

In Australia, as shown in Figure Two, the largest number of skilled people are employed in the *Social Services* sector. The 930,000 people employed at Skill Level 1 in this sector are concentrated in Education and Health. The second largest employer of highly skilled people is *Producer Services*, with 471,800 employees at Skill Level 1. *Producer services* are considered to be at the forefront of the knowledge economy because they employ large numbers of highly skilled people and finance, insurance, property and business services are increasingly global in orientation.

Lower skilled employment is concentrated in the *Distributive Services* sector. The *Distributive services* sector contributes 20.6 per cent of GDP and has grown by 48 per cent since 1990. *Distributive Services* employ the largest number of people with low levels of skill, with 792,700 employees in Skill Level 5. Most of this employment is concentrated in *Retail Trade*, which employs 656,700 low skilled workers. If this sector continues to expand, we can expect the number of low-skilled jobs in the Australian labour market to grow.

In summary, by the OECD's criteria, Australia appears to be a strong participant in the 'knowledge-based economy' experiencing growth in financial and business services and communication services sector (see Table 1); as well as rising demand for highly qualified labour (see Tables 3 and 4). Australia is also experiencing strong growth in lower skilled jobs in sectors such as retail trade, but a higher proportion of these jobs are part-time.

If we accept the OECD argument about the importance of high skills and lifelong learning to a nation's economic performance, there is no evidence of failure in these areas in Australia. Australia has a high proportion of qualified workers who are employed in what the OECD defines as 'knowledge-based industries'. These 'knowledge-based industries' are a fast-growing sector of the Australian economy.

### 4.3 Participation in education and training in Australia

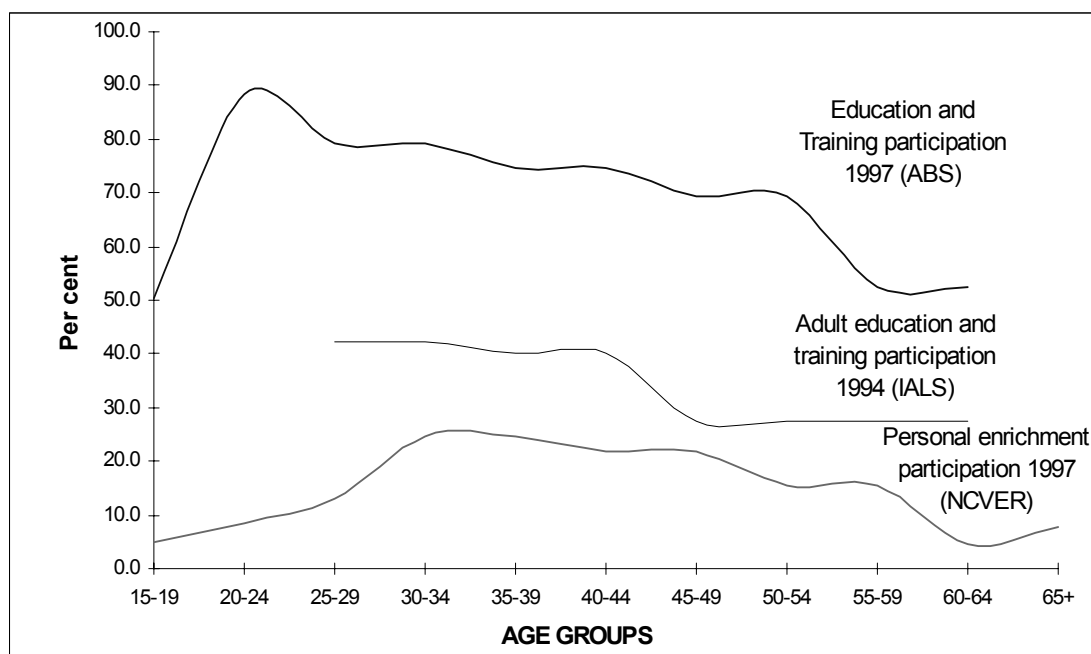
The OECD publishes comparative statistics on participation in formal education in *Education at a Glance OECD Indicators 2000 Edition*. These data place Australia below the OECD average in terms of completion of upper secondary education and above the OECD average in terms of access to university education (*Education at a Glance 2000*: 149, 150). However as these data refer to schools and higher education systems, they measure only one aspect of participation in education. Their comparative usefulness is also limited by the differences in the structures of formal education and training across OECD countries.

*Education at a Glance 2000* also contains comparative statistics on adult participation in continuing education and training, based on the International Adult Literacy Survey (IALS). The IALS was conducted in 1993-94 and surveyed adults aged between 25 and 64 years. The data produced from this survey forms the basis of an 11-country comparison of adult participation in continuing education and training by O'Connell (1999) as well as in *Education at a Glance 2000*: 195-204.

Australia ranks eighth out of eleven countries in terms of the percentage of adults aged between 25-64 years engaged in continuing education and training. O'Connell (1999) found only 35.6 per cent of Australian adults aged 25-64 participating in continuing education and training in the twelve months prior to 1994. However in terms of participation in *job-related* continuing education and training among employed adults, Australia ranked fourth out of 11 countries with a participation rate of 38.1 per cent.

In the IALS, participation in education or training was defined as 'any training or education including courses, private lessons, correspondence courses, workshops, on-the-job training, apprenticeship training, arts, crafts, recreation courses or any other training or education' (O'Connell 1999:6). The main limitation of the IALS survey is that it does not report participation in informal types of learning, such as on-the-job training.

**Figure 3: Participation in education and training by age group, Australia**



Sources: ABS *Education and Training Experience 1997* (Cat. No. 6278.0), NCVER *Australian Personal Enrichment Programs 1997*, O'Connell P 1999 *Adults in Training: An international comparison of continuing education and training*. OECD (CERI/WD(99)1).

Notes: 'Education and Training' refers to on-the job training, study for qualifications and training courses to obtain, maintain or improve work-related skills, conducted at a designated time, in a structured format, but not necessarily leading to a qualification. 'Personal Enrichment Programs' refers to recreation, leisure and personal enrichment programs also known as 'Stream 1000' programs. The NCVER figures are likely to understate the level of participation, because they are obtained from institutional level data and exclude educational services offered by many private providers. In the IALS survey 'Adult education and training participation' refers to any training or education including courses, private lessons, correspondence courses, workshops, on-the-job training, apprenticeship training, arts, crafts, recreation courses.

Both formal and informal learning are reported in the ABS Survey of *Education and Training Experience*, which is shown in Figure Three. The ABS survey collected data on the basis of a more narrow definition of training in terms of 'work-related skills' and did not include courses undertaken for recreational purposes, but did measure participation in on-the-job training. On-the-job training can include informal learning activities such as asking questions of co-workers, teaching yourself, being shown how to do your job, and watching others work.

Figure 3 shows data on participation in education and work-related training as reported by ABS as well as participation in recreational courses, or 'Personal Enrichment Programs' reported by NCVER for 1997. The IALS data on participation in both work-related and recreational courses in 1994 are also shown on this chart. The IALS data are broadly consistent with the ABS data on participation in study or training courses collected in 1993.

In 1997, a total of 72 per cent of the Australian population of working age (ie. 15-64 years) had participated in some form of education or training over the previous twelve months. Education and training participation is highest among young adults (aged 20-24 years) 88 per cent of whom participate in education and training and lowest among 55-64 year-olds, of whom only 53 per cent participate in education and training. According to a separate NCVET survey, 379,700 clients or 3.1 per cent of the 15-64 year-old population undertook personal enrichment programs over the same period. Participation in personal enrichment courses is highest among the 30-39 year age group (19.3 per cent of whom participate) but remains above ten per cent of all age groups up until 60 years of age.

The ABS Time Use Survey provides a similar picture in respect of all types of educational activities. Education is the third most significant activity for people of working age (ie. 15-65 years) after personal care and employment-related activities. Young people between the ages of 15 and 24 years spend more of their time on educational activities than any other age group and people between the ages of 35-44 years spend the least amount of time on education, except for those aged 65 and over (ABS Cat. No. 4153.0).

Participation in education and training is higher among people who are employed. Eighty per cent of Australian wage and salary earners engaged in some form of work-based training during the twelve-month period prior to 1997. The ABS Survey of *Education and Training Experience* enables us to track changes in the participation of wage and salary earners since 1989. The overall rate of participation in education and training declined between 1993 and 1997, but most of this decline occurred in on-the-job training and study for qualifications. Fifty-three per cent of wage and salary earners are engaged in study or training courses, up from 47 per cent in 1993, as shown in Table 5.

**Table 5: Participation in education and training by wage and salary earners, Australia 1989, 1993, 1997**

YEAR	Study or training courses undertaken (%)				On-the-job training
	Study	In-house	External Training		
			Employer-supported	Not Employer-supported	
1989	16.8	34.9	6.4	3.4	71.8
1993	18.6	31.3	7.3	4.5	81.8
1997	15.8	33.0	11.7	8.3	71.6

Source: *Education and Training Experience Survey 1997, Training and Education Experience 1993*. ABS Cat No. 6278.0

Participation in on-the-job training (ie. the most informal type of training) has fallen from 81.8 per cent of wage and salary earners in 1993 to 71.6 per cent of wage and salary earners in 1997. Participation in external training courses has grown strongly from 11.8 per cent of wage and salary earners in 1993 to 20 per cent in 1997. An increasing proportion of external training courses are undertaken by workers without employer support. While 20 per cent of workers engaged in external training courses in the twelve months prior to 1997, 41 per cent of these workers received no employer support.

In summary, Australian participation in education and training is high, involving 72.4 per cent of the population aged between 15 and 64 years. At least 50 per cent of any age cohort between 15 and 64 years is engaged in education and training in Australia. Among Australian workers, 80 per cent of wage and salary earners participate in both formal and informal training activities and 53 per cent are engaged in formal education and training courses. Participation in external training courses by wage and salary earners almost doubled between 1994 and 1997. Almost half (42 per cent) of external training courses undertaken by wage and salary earners are completed without financial support from their employers.

Although it is difficult to predict the demand for high skilled workers in the future, Australia has experienced steady growth in high-skilled employment over the past 15 years. High-skilled, full-time jobs are growing fast in aggregate terms and are concentrated in the fast-growing industries identified with the 'knowledge-based economy'. Australia has high levels of participation in education and training, particularly among wage and salary earners, and an increasing amount of work-related training is occurring without employer support. From these trends, it appears that a growing proportion of Australian workers are self-motivated and self-funded participants in education and training. This is consistent with the lifelong learning policy agenda.

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## 5 Lifelong learning and inequality

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The lifelong learning policy agenda implies that participation in education and training should be universal in the 'knowledge-based economy', for both economic and social reasons. The economic argument is that new technology is so transforming the workplace that all workers need the capacity for lifelong learning. Growth in demand for customised goods and services implies that more workers will need to be flexible, adaptable and communicative as well as possessing more traditional skills. The literature generally suggests that technological change will require workers to learn new skills and work in new ways in order to produce value-added goods and services (see Gee, Hull and Lankshear 1996; Lave 1991, Sheehan 1998, Mulcahy and James 1999).

The social benefits of higher educational outcomes are well-documented. Higher levels of literacy competence are linked to better health, more efficient consumption choices, and non-participation in criminal activities. People with more schooling are likely to make more informed choices when voting and to participate more actively in their communities through, for example, voluntary work. Education levels appear to be a determinant of people's trust in others which also produces positive externalities. The OECD International Adult Literacy Survey also observed a strong association between the number of women in parliament and the literacy level of a country (see OECD 2000 *Literacy in the Information Age, Final report of the International Adult Literacy Survey*: 83).

Total levels of participation in education and training in Australia are relatively high, however there is a gap in the participation rates of various social groups. Although the educational outcomes of many individuals from disadvantaged groups have improved over the past decade, the educational and employment outcomes of particular sub-groups remain poor relative to the general population (Watson et al 2000, Spierings 2001). This section explores the widening divide in the distribution of educational opportunities between high skilled and low skilled workers in Australia and identifies new barriers to participation created by the 'knowledge-based economy'.

### 5.1 Market-generated barriers to participation

A key characteristic of the lifelong learning policy agenda is the idea that individuals will be self-motivated and self-funded learners. This assumes that the market will reward individuals for the costs of their education investments. The growing importance of high skills in the 'knowledge-based economy' has changed the incentive structure for private investment in education and training. This is having an impact on the distribution of educational outcomes between social groups, and is creating new barriers to participation in education and training.

### 5.1.1 Distribution of education and training opportunities

In Australia, according to the *Education and Training Experience Survey*, the majority of workers in all sectors of the economy participated in education and training in 1997. Workers in the *Construction* sector and the *Agriculture, forestry and fishing* industries were the least likely to participate in education and training (68 per cent) whereas over 90 per cent of workers in the *Electricity, Gas and Water Supply, Finance and insurance* and *Education* sectors participated in education and training.

Lower skilled workers are less involved in education and training than those in high skilled jobs. In the twelve months prior to 1997, people in professional and managerial occupations were the most likely to participate in some form of education and training (90 per cent) compared to 64 per cent of workers at the lowest skill level.

**Table 6: Types of education and training undertaken by employed persons by skill category and type of employment, 1997**

	Type of Education or training activity				
	Study	On-the-job training	In-house training course	External training course	Some training undertaken
<b>Skill Category</b>					
1	15%	77%	37%	31%	90%
2	12%	62%	29%	19%	83%
3	11%	51%	17%	13%	76%
4	9%	49%	23%	11%	74%
5	7%	35%	12%	7%	64%
<b>Employment type</b>					
Full-time	15%	76%	38%	22%	84%
Part-time	18%	62%	23%	16%	71%
Permanent	15%	76%	40%	22%	85%
Casual	18%	61%	15%	14%	69%

Source: ABS *Education and Training Experience Australia 1997* (Cat. No. 6278.0)

Notes: The categories of training are not mutually exclusive so people can participate in more than one form of training activity.

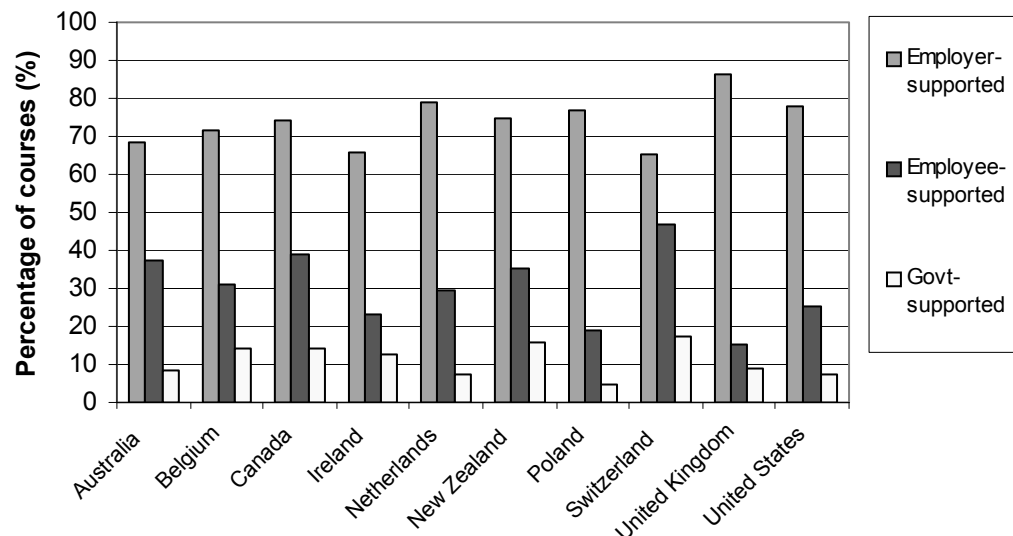
Workers who are permanent employees or full-time undertake the most education and training, whereas workers who are casual undertake the least. A higher proportion of casual and part-time workers are studying for qualifications compared to any other category.

### 5.1.2 Employer support for training

Figure 4 shows the three main sources of support for job-related training in ten OECD countries – employers, employees and government – based on data collected through the international adult literacy survey in 1994.

**Figure 4: Sources of support for job-related continuing education and training courses taken by employed adults 1994**

Source: O'Connell, Philip J 1999. *Adults in Training: An international comparison of continuing education and training*. OECD/CERI /WD(99)1



Notes: Data collected through International Adult Literacy Survey. As the unit of analysis is the individual, totals are likely to sum to greater than 100%. Refers to a maximum of three courses in the case of each individual, and includes courses funded by multiple sources.

As indicated in Figure 4, Australia has the third highest rate of self-financed participation in job-related education and training of any OECD country. Thirty-eight per cent of job-related courses undertaken in Australia are financed fully or in part, by the employees. Only Switzerland and Canada have higher levels of self-financed work-related training.

The level of support by employers for job-related training in Australia is relatively low. In terms of job-related courses that are supported by employers, Australia has the third lowest rate of employer-supported courses in the OECD. Only Ireland and Switzerland have lower levels of employer support for work-related training, and both of these countries have higher levels of government support for job-related training than Australia. The level of government support for work-related training in Australia is about half that in Switzerland and one-third of the level in Ireland (Figure 4).

In Australia, workers in the lowest skill category are the least likely to receive employer support to participate in external education and training courses, as shown in Table 7.

**Table 7: Employer support for external training courses by skill category, and type of employment, 1997.**

Skill band	No. of courses	Employer-supported	Not Employer-supported
1	738,800	57%	43%
2	208,400	54%	46%
3	248,600	47%	53%
4	331,900	51%	49%
5	176,800	33%	67%

Source: ABS *Education and Training Experience Australia 1997* (Cat. No. 6278.0)

Only one third of external training courses undertaken by workers in Skill Category 5 are financially supported by employers compared to 57 per cent of external training courses undertaken by workers in Skill Category 1.

The lifelong learning policy agenda emphasises the need for workers to be self-motivated and self-funded learners. However, there is a disparity in the extent to which employees in different skill bands are expected to finance their own education and training. Rates of participation in education and training among low skilled workers are already lower than their more highly skilled colleagues, yet when low-skilled workers undertake external *work-related* training courses, they are more likely to pay for it themselves.

There is currently no shortage of low-skilled jobs in the Australian economy. But these jobs are increasingly part-time and with poor wage outcomes. As previously indicated, Australia has experienced strong growth in the *Retail Trade* sector which the OECD describes as ‘a large generator of low-paid and unstable jobs, especially for women’ (OECD *Employment Outlook 2000*: 83). Maglen and Shah depict the fact that the jobs in in-person services are low-skilled and mostly part-time as a bad outcome for employment. Part-time and casual employees also receive lower levels of employer support for external training courses. For full-time permanent employees, 66-68 per cent of external training is financed by employers compared to 35 per cent for part-time workers and 21 per cent for casual staff.

Skill Category 1 and Skill Category 5 have experienced the strongest employment growth over the past decade, yet they offer substantially different levels of training opportunities. If the trend for strong employment growth in both the high skilled and low skilled jobs continues, the disparity in the distribution of education and training opportunities between high-skilled and low-skilled workers will increase.

### 5.1.3 Distribution of wages

The lifelong learning policy agenda draws on the human capital observation that people get a return on educational investments through higher wages. Australian data (shown in Table 8), demonstrate the rates of return to each year of post-compulsory education.

**Table 8: Rates of return to education (years of schooling) Australia, 1988**

1	2	3	4	5	6
Year 9	Year 10 (11 years)	Year 12 (13 years)	Diploma (15 years)	Bachelors Degree (16 years)	Degree over Year 12 (Sum Columns 4,5)
	21	27	23	14	37

Source: Vella, F. and Gregory, R.G. (1996). 'Selection bias and human capital investment: Estimating the rates of return to education for young males'. *Labour Economics* 3: 197-219: 214.

Notes: The data indicate the percentage by which the average wage for each level of schooling exceeds that of the previous group, except for column 6. The returns to Year 10 (Column 2) are compared to the returns to individuals who left school in Year 9.

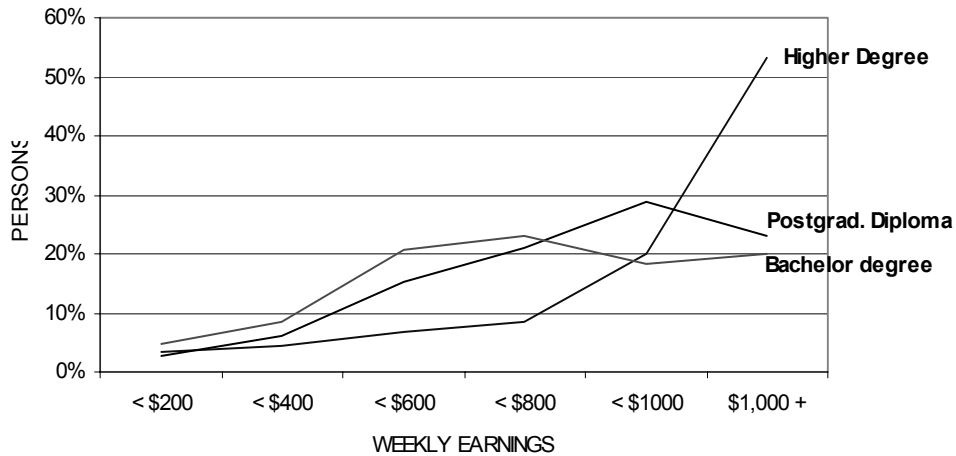
The data reveal a steep increase in earnings for those who complete Year 12 compared to students who drop out of school in earlier years. A Year 12 graduate can expect to earn 27 per cent more than someone who left school at the end of Year 10, and 48 per cent more than someone who left school at the end of Year 9. A person with a diploma earns 23 per cent more than a Year 12 graduate, and a Bachelor's degree should add 14 per cent more to the earnings of a person with a Diploma. A person with a university degree can expect to earn 37 per cent more than someone who completed Year 12.

Although there are differences in the rates of return to levels of education in countries around the world, the broad observations are the same. Education appears to deliver substantial returns to individuals in terms of relative earnings. Observing the rates of return to schooling in over sixty countries, Psacharopoulos (1985) found that the returns to education were common to all countries and highest in countries with the lowest per capita income. However these data do not provide refined measures of the returns to qualifications obtained below the Associate Diploma level.

The ABS *Education and Training Experience Survey* reports the usual weekly earnings of respondents by their most recent qualification. These data reveal the distribution of earnings for individuals at each level from a basic skills qualification through to a higher degree.

Figure 5 illustrates the distribution of weekly earnings for people with the three highest qualifications: Bachelor's degrees, postgraduate diplomas and higher degrees. People with higher education degrees are clustered at the highest end of the earnings distribution. Fifty-three per cent of people with Higher degrees earn over \$1,000 per week. People with post-graduate diplomas are concentrated in the two highest wage brackets—50 per cent of people with a postgraduate diploma earn more than \$800 a week. Sixty per cent of people with a Bachelor's degree earn \$600 a week and above. This pattern is consistent with the observation that investing in a higher level qualifications is likely to pay off in terms of higher income.

**Figure 5: Usual weekly earnings in current job by level of most recent qualification (Bachelor's degree and above), Australia, 1997.**

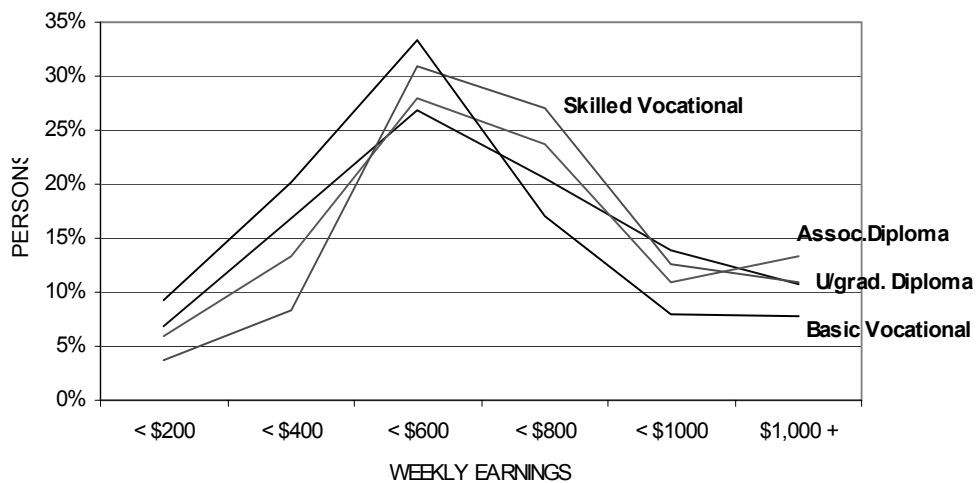


Source: *Education and Training Experience Australia 1997* (Cat. No. 6278.0)

The distribution of earnings for people with lower level qualifications is markedly different. Figure 6 shows the distribution of earnings for people with basic vocational qualifications, skilled vocational qualifications, associate diplomas and undergraduate diplomas.

**Figure 6: Usual weekly earnings in current job by level of most recent qualification (Undergraduate Diploma and below), Australia, 1997.**

Source: *Education and Training Experience Australia 1997* (Cat. No. 6278.0)



In contrast to people with higher level qualifications (Figure 5) the distribution of earnings for people with lower level qualifications reported in Figure 6 is roughly the same. Most people within each of these categories earn between \$400 and \$800 per week. The highest proportion of people in each category of qualification is in

the \$400-600 wage bracket. Although there may be some pay off for people who upgrade their qualifications at this level, for many workers at this level of skill, the investment in obtaining a higher qualification may not pay off in terms of higher earnings.

In summary, most people with high level qualifications are rewarded for their educational investment by receiving higher wages. In contrast, people investing in qualifications at the diploma level and below are less likely to be rewarded with higher wages. While people at the lower end of the skills distribution may receive some pay off in terms of higher wages for increases in the educational attainment, it does not appear to push them into higher income categories. This is consistent with Ryan's findings that better employment outcomes in both the VET and higher education sectors are obtained by students who complete higher level qualifications (Ryan 2000).

Taken together, people with low skills face significant market 'barriers' to participate in education and training. Low skilled workers receive fewer market incentives to invest in education and training. There is less employer provision of education and training for low-skilled workers. Employers are less likely to provide financial support for participation in education and training by low-skilled workers. Participation in education and training at the lower levels of skill appears less likely to result in substantially higher wages. As Rubenson and Xu point out, 'the nature of the work position acts as both an incentive and a barrier to lifelong learning' (1997:84).

In the new economy, jobs are growing fastest in the highest and lowest categories of skill. People in high skilled jobs receive the most amount of employer assisted and supported training whereas people in the lowest Skill band receive the least. If the trend of growth in the lowest and highest skilled jobs continues, the new economy will generate inequality in the distribution of education and training.

## **5.2 Educational barriers to participation**

People with low skills face additional barriers to education and training that are generated by the nature of the education and training system. These barriers are discussed below.

### **5.2.1 Educational attainment**

Research consistently reveals a strong relationship between levels of formal schooling and later involvement in adult education (Courtney 1992). Two decades ago, American education researchers concluded 'the most powerful predictor of participation in adult education is amount of formal schooling' (Anderson and Darkenwald 1979). Australian research confirms the link between level of formal education and participation in adult education. People with university degrees are twice as likely to participate in adult education and training as people with a high school qualification (AAACE 1995). The ABS survey of Education and Training Experience found 82 per cent of people with post-school qualifications engaged in education and training compared to 62 per cent of people without post-school qualifications.

The *Education and Training Experience Survey* identified 194,500 young adults (seven per cent of the 15-24 year old population) who had left school and did not have a job. Expectations about obtaining work was the reason cited by a quarter of these early school-leavers for why they left school, even though they were subsequently unsuccessful in the labour market. School-related factors accounted for the decisions of most of the group—especially males—and dislike of school or teachers was more frequently cited than lack of academic success by both male and female non-completers. Taken together, academic failure, dislike of school or teachers, course not offered or study load too heavy, and lack of interest/motivation accounted for 48 per cent of total responses<sup>11</sup>.

Research suggests that many young people leave school early—without a job to go to—because they feel unsuccessful in the formal education system. An Educational Outcomes Survey conducted by the University of Melbourne found that a young person’s dislike of school was strongly associated with his or her perception of lack of success in school-work—especially in English (NBEET 1995). This association is strongest among males. Students tend to drop out of secondary school if they feel like academic failures—regardless of their prospects of employment. Young people’s expectations of getting a job are more closely aligned to their self-perception of not doing well academically than any knowledge of the youth job market (NBEET 1995). Below-average attainment in literacy and numeracy during the middle years of schooling also has a strong influence on both subsequent non-completion of school and a person’s likelihood of being unemployed when they leave school (Marks and McMillan 2001).

The failure of formal education and training systems to meet the needs of early school leavers has spawned the development of an array of locally based initiatives attempting to provide an integrated set of services to young people who are not engaged in education or employment. These “community partnerships” generally use case managers to deliver a range of services to individuals such as pastoral care, housing assistance, and education and training, as well as pathways to employment. (Spierings 2001). This “community partnership” approach was a central focus of the Commonwealth government’s recent investigation into Youth Pathways (Eldridge 2001). Among the package of measures implemented in response to the Eldridge report is a Partnership Outreach Education Model that is trialling new approaches for engaging young people who have become disconnected from mainstream education during 2002 and 2003.

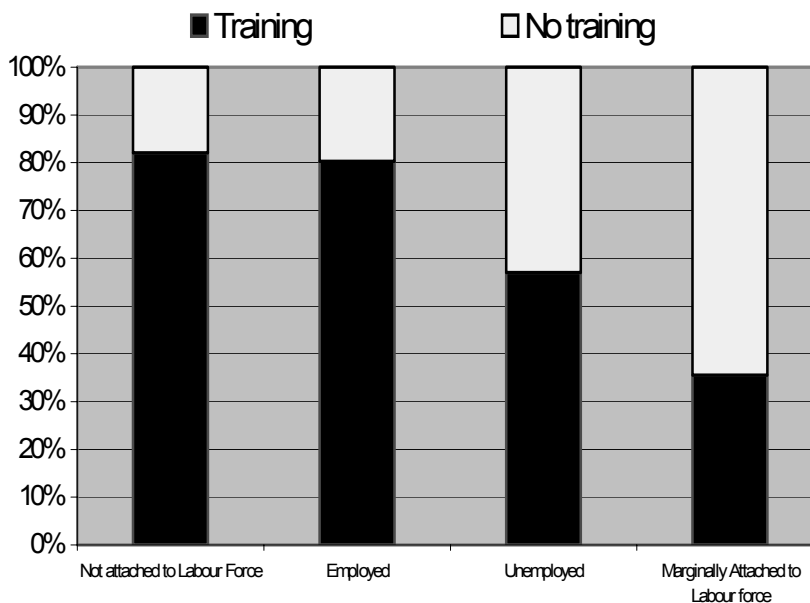
## 5.2.2 Unemployment

People who are unemployed or marginally attached to the labour force are less likely to participate in education and training than those who are employed. Whereas 80 per cent of employed persons undertook some form of education and training in the twelve months prior to 1997, only 57 per cent of unemployed persons were involved in education and training. People who were marginally attached to the labour force undertook the least education and training (35 per cent) as illustrated in Figure 7.

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<sup>11</sup> One fifth of all responses were categorised by ABS in “Other”, a category which includes persons who states “too expensive, financial reasons or no money” and “location of establishment or transport difficulties” and “other”. The distribution of responses in this category may warrant further investigation.

**Figure 7: Participation in education and training by labour force status Australia, 1997**



Source: ABS 1998 *Education and Training Experience Australia 1997* Cat No 6278.0

Notes: 'Education and Training' refers to participation in all forms of training for 15-64 year olds, including studying for a qualification and excluding those still at secondary school. 'Marginally attached to labour force' refers to people who were not in the labour force when surveyed but who wanted to work. People 'not attached to the labour force' who are engaged in education and training are mainly full-time students.

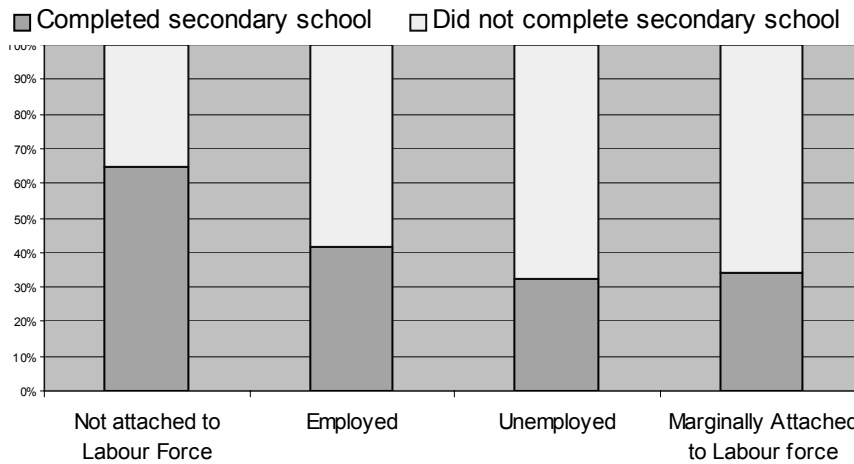
People who are unemployed also tend to be less well educated than people who are employed, and therefore less likely to participate in continuing education as adults. People who are unemployed or marginally attached to the labour market are less likely to have completed Year 12 than people in employment, as illustrated in Figure 8. Forty-two per cent of employed people in 1997 had completed Year 12 compared to 32 per cent of unemployed people and 34 per cent of people who were marginally attached to the labour force (ABS 1998).

The people most likely to participate in continuing education and training as adults are those who have had a successful experience of formal schooling, especially in reaching the critical turning point of completing Year 12. This traditional barrier to participation in education and training becomes more significant as more forms of work require continuing participation in education and training.

But we should not assume that participation in courses of education and training – in their current form – will necessarily improve the employment outcomes of low skilled people. People who are unemployed or not in the labour force prior to some course of education and training are less likely to find full-time employment after completing a course of education or training than people who were employed previously. Ryan (2000) found that the employment status of individuals prior to studying has a significant impact on their post-course outcomes. Whereas 80 per cent of TAFE graduates who were employed full-time prior to undertaking their course were employed full-time on completion, the full-time employment rate for graduates who had been unemployed or not in the labour force prior to their course

was less than 30 per cent (Ryan 2000:11). Female graduates who held prior qualifications but had not undertaken work experience had very poor employment outcomes.

**Figure 8: Secondary school completion by labour force status Australia, 1997**



Source: Australian Bureau of Statistics Education and Training Experience 1997 Cat No. 6278.0

Notes: "Training" refers to participation in all forms of training for 15-64 year olds, including studying for a qualification and excluding those still at secondary school. "Marginally attached to labour force" refers to people who were not in the labour force when surveyed but who wanted to work.

Research suggests that some courses of education and training are better at improving a participant’s employment outcomes than others. Ryan (2000) found that employment experience, either prior to or during a course of study had a positive effect on student’s employment outcomes. In addition, courses with a significant structured work experience component had better employment outcomes than other courses.

### 5.2.3 Pathways from vocational to higher education

The pathway from vocational education to higher education is increasingly taken by students with lower level qualifications. In 1997, 17.6 per cent of students admitted to Bachelor degree courses in universities had previously undertaken TAFE study, compared to 12.1 per cent in 1992 (Cummins et al 1998).

The number of students moving from Higher education to VET studies is even greater than the movement from VET to university, but the motivations of the students are quite different. Although the students with university experience enrolling in TAFE courses are not a homogeneous group, Golding concludes ‘ the overall participant perception of the move from university to training was of a cheaper, quicker and easier way to gain a new vocational skill or qualification, by means of a more flexible learning and study mode and with better job prospects’ (Golding 1999: 11). In contrast, the transfer from TAFE to university is characterised as ‘primarily an attempt to improve employment status in a related field’ (Golding 1995).

The transition from TAFE courses to university studies is not as easy as the transition from Year 12 to university. There is a considerable diversity between higher education institutions in the number of TAFE students admitted and in the amount of credit granted for prior study. In 1997, only 38 per cent of the former TAFE students admitted to Bachelor's degrees were admitted on the basis of their prior TAFE study. Of this group, only 40 per cent were granted credit for their previous study. Former CAEs and Institutes of Technology are more likely to admit former TAFE students (comprising 7.3 per cent and 10.3 per cent of admissions respectively) than members of the Group of Eight (2.4 per cent of admissions). Former CAEs and Institutes of Technology are also more likely to grant TAFE students credit for former studies (34 per cent and 54 per cent respectively) compared to 31 per cent for the Group of Eight (Cummins et al 1998).

The amount of credit granted to former TAFE students undertaking Bachelor's degrees is quite low. For all universities, the mean credit granted is 18.3 per cent (Cummins et al 1998). Between 1993 and 1997, the average amount of credit granted to TAFE graduates remained the same. But the amount of credit granted by institutions changed over the period. Although the proportion of TAFE students admitted and granted credit by universities in the Group of Eight increased between 1993 and 1997, the mean credit granted by Group of Eight universities fell from 21.8 per cent in 1993 to 18.4 per cent in 1997. The mean credit granted by former CAEs over the same period increased from 19.7 per cent to 24 per cent whereas it fell slightly from 16 per cent to 15.2 per cent in the former Institutes of Technology (Cummins et al 1998).

In Victoria in 1997, dual sector institutions admitted almost three times as many TAFE graduates to Bachelor degrees as single sector institutions (11.4 per cent and 4.6 per cent respectively). Fifty per cent of TAFE graduates were granted credit in dual sector institutions compared to 35 per cent in single sector institutions. However the mean credit granted was lower in dual sector providers (14.9 per cent) than in single sector institutions (20.6 per cent) (Cummins et al 1998).

As universities are supported through a different funding system to TAFE institutes, there are mixed incentives for universities to accept TAFE students or grant them credit for study completed. The rate at which TAFE students are admitted to universities appears to be affected by other areas of supply and demand. It has been suggested that more TAFE students are accepted in times of low demand from school leavers in order to maintain the level of TER entry scores for specific courses. Applicants from TAFE courses also have particular difficulty in gaining offers to courses with high TER cut-offs (Lewis in Cohen et al 1997). The primary financial incentive for any institution is to maximise its own student load before awarding credit to students from other institutions (Watson et al 2002, Wheelahan 2000). The recognition of students' prior learning (RPL) by universities is also problematic due to lack of awareness on the part of university staff and the considerable financial and administrative costs of RPL assessment processes (Taylor and Clemans 2000, DETQ 2001)

Students entering university from vocational education courses face additional costs in terms of time and fees if they are not granted full credit for prior study. Sixty per cent of all TAFE graduates admitted to university courses are granted no credit for former study. Of those who are granted credit, the mean credit granted for all institutions is 18.3 per cent (Cummins et al 1998). For students entering a three year Bachelor's degree, this amounts to a reduction in course load of about half a year,

or one semester. Yet it is quite possible that such a student would have completed 13 years of formal schooling and one year's study towards a diploma in TAFE.

Government policies to support cross-sectoral movement of students have focused on improving the arrangements for credit transfer and recognition of prior learning (RPL) by universities. Although progress has been slow, over the past decade there has been 'a gradual improvement in both the admission procedures and in credit transfer arrangements during that time' (Cummins et al 1998: 9). In 1998, the Australian Vice-Chancellor's Committee (AV-CC) and the Australian National Training Authority (ANTA) commissioned a joint study on credit transfer and articulation between the VET and Higher Education sectors. The project report *Pathways to Partnerships* includes a set of draft national policy guidelines on cross-sectoral qualifications linkages and recommends a series of strategies to support the implementation of the national policy (Carnegie 2000). In response to the report *Pathways to Partnerships* (Carnegie 2000), the AVCC issued a new set of *Policy Guidelines on Cross-Sector Qualification Linkages* (AVCC 2001) that replace the previous AVCC *Credit Transfer Principles*. The new *Policy Guidelines* cover 'any formal connection between qualifications issued within VET and higher education' (AVCC 2001 *Preamble*). In its present review of the higher education sector, the Commonwealth government will be examining further the issue of articulation and credit transfer between VET providers and universities (Nelson 2002).

In summary, people with low skills face a range of market disincentives and structural barriers to participate in post-compulsory education and training. Training opportunities are unevenly distributed between people in high skilled and low skilled jobs. As these jobs are in the fastest growing sectors of the economy, the disparity in participation rates between low skilled and high skilled people is likely to widen. Australia's capacity to achieve higher levels of educational participation may be undermined by a widening socio-economic gap between individuals who participate in education and training and those who do not. As it presently stands, the emphasis the lifelong learning policy agenda places on individuals' co-financing of their own learning appears to contradict its stress on lifelong learning as a remedy for social exclusion. Given the many factors inhibiting participation in education and training for less-skilled individuals in low-wage jobs, governments should play a greater role than generally acknowledged in the literature in breaking the nexus between low skills and non-participation.

## 6 Policy directions and further research

Although Australia's education and training system has been adequate to meet recent changes in demands for skilled workers, we need to consider how the system is placed to meet future needs. The main impact of the new economy on education and training has been to:

- Increase demand for education and training, particularly among people with high skills; and
- Generate increased inequality in the distribution of education and training opportunities.

People at the higher and lower ends of the skill distribution have always had vastly different experiences of education and training. However, the effect of these differences was previously mitigated by the existence of well-paid full-time jobs in the manufacturing sector. With the decline of such jobs and the rise of part-time and casual work, government policy must acknowledge the different opportunity structures for high-skilled and low-skilled people within the education and training system.

### 6.1 Future skill requirements

Studies of changes in the skills composition of the Australian workforce indicate that Australia is likely to continue to experience growth in both highly skilled and low-skilled jobs. One interpretation of this trend is that Australia need not be too concerned about producing highly skilled workers because industry still demands low-skilled employment. Meagher (1997), for example, cautions against making generalisations about the impact of structural change on the demand for skills. Based on an analysis of changes in the distribution of employment across occupations between 1986-87 and 1994-97, Meagher concluded that structural change does not necessarily favour the employment of workers with higher level qualifications<sup>12</sup>.

One of the fastest growing sectors of the Australian economy (*Producer Services*) is creating employment for high skilled workers while the other fastest growing sector (*Distributive services*) is creating low-skilled jobs. However jobs for low skilled workers are increasingly part-time and there is an increasing differential between the wages of highly skilled and low skilled workers. In reviewing the international literature on the impact of technological change on the labour market, Berman, Bound and Machin (1998) found the labour market outcomes of less-skilled workers have deteriorated in developed countries over the past two decades.

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<sup>12</sup> He also pointed out that ; "for Australia, progressive trade liberalisation shifts employment away from 'professional, technical, administrative and managerial occupations' and into agriculture, the opposite of the effect thought likely to pertain by the OECD" (Meagher 1997: 24).

Although people with higher levels of education have better labour market outcomes than people with lower levels of education, the extent to which labour market outcomes can be improved through education and training has not been fully explored. Research suggests that Year 12 completion is a significant predictor of an individual's employment prospects and future participation in education. We should not assume that unemployment would disappear if we could educate everybody to Year 12. At the same time, we must monitor the extent to which existing measures (VET in School, New Apprenticeships) and new programs (such as the Partnership Outreach Education Model) meet the needs of people who are not likely to complete Year 12 in formal schooling – in terms of both participation in education and pathways into employment.

## 6.2 A flexible and fair tertiary education system

As there are strong market incentives for high skilled workers to participate in education and training, the tertiary education system should be efficient, flexible and responsive to the needs of this group. On the other hand, people with lower skills receive fewer market rewards for participating in education and training as well as facing structural barriers to participation. This suggests the need for separate—yet complementary—policy directions to:

- Remove any constraints on the expansion of the system; and
- Remove structural barriers to participation in lower level of qualifications.

These objectives should be pursued within a regulatory framework that guarantees course quality.

Education and training institutions are becoming more flexible and responsive to the economy's demand for continuing education and training provision. Individuals enrol in units of study rather than full qualifications, participate in non-award courses, and take part in the increasing two-way traffic between universities and TAFE institutions. A recent survey of private providers in higher education found that they occupy a small but growing share of the higher education market. In the vocational education and training sector, private and community providers account for over 25 per cent of the sector's students and are able to tender on a competitive basis for public funding. The role of private provision is a factor which should be considered in assessing the adequacy of future supply of education and training

The new economy is generating increased inequality in education and training opportunities between people with high and low skills. The market offers fewer incentives for people with low skills to participate in education and training and employers are less likely to support them. The wage levels of people with lower level qualifications (ie. basic vocational, skilled vocational and associate diplomas) are very similar, so an investment to upgrade qualifications at these levels is less likely to pay off in terms of higher wages. These factors could combine to discourage participation in education and training at the lower skill levels. To improve participation in education and training among people with low skills would require additional subsidies and incentives targeted on this group.

It could be argued, of course, that the lack of incentives for people with low skills to invest in education and training is acceptable because it indicates that the market does not require these skills. This view implies that there is no need for government

policy intervention in respect of education and training. However, as a minimum, government policy intervention in education and training is justified on three grounds. The first reason is to overcome imperfections in capital markets to make capital available at comparable terms for human and physical investment (see Friedman 1962). The second reason is to influence the investment decisions taken by individuals with discount rates that are higher than socially optimal – those who are likely to emphasise the immediate pecuniary and non-pecuniary costs of education over any anticipated long-term income flows. The third reason is to generate positive externalities for society as a whole such as better health, more efficient consumption choices, and lower crime rates. These three reasons provide the policy rationale for current levels of government involvement in education and training. A further argument for government investment in education and training to pursue strategic economic goals such as innovation and skills development has characterised recent policy initiatives such as *Backing Australia's Ability* (see Chapter 2). The extent to which governments might intervene to assist people with low skills to invest in education and training will be made in the context of these considerations, and possibly other criteria.

Government policies aiming to encourage participation in tertiary study have attempted to minimise upfront costs through income-contingent loans in higher education and through low charges and fee concessions and exemptions in TAFE. Cost appears to be a barrier for a relatively small proportion of non-learners.<sup>13</sup> About 70 per cent of TAFE students are required to pay fees up-front. TAFE fees are set by State and Territory education authorities and range between \$200 and \$1000 per year. (see Watson et al. 2002). Given the lack of market rewards for participating in education and training at this level, even low up-front fees and course costs could be a disincentive for people with low skills to engage in education and training.

Current patterns of participation indicate increased student movement between TAFE institutions and universities. One in six students admitted to Bachelors' degrees in universities has previously undertaken study in TAFE. The movement from vocational education and training to higher education is an important education and training pathway for students from educationally disadvantaged social backgrounds. But students who gain access to university via this route face more obstacles than students who enter directly from Year 12. An expert research team concluded recently, 'despite recent changes to university admission procedures, there still appears to be a lack of predictability, consistency and transparency of the assessment procedures which TAFE graduates will confront' (Cohen et al 1997).

In 1998, the Australian Vice-Chancellor's Committee (AV-CC) and the Australian National Training Authority (ANTA) commissioned a joint study on credit transfer and articulation between the VET and Higher Education sectors which has resulted in a new set of policy guidelines for the higher education sector. In its present review of the higher education sector, the Commonwealth government will be examining the issue of articulation and credit transfer between VET providers and universities (Nelson 2002). Further enhancement of the predictability, consistency and transparency of credit transfer procedures for students moving from vocational education and training to the higher education sector could be a policy option for the future.

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<sup>13</sup> A recently published study in DEST on why people don't participate examines the extent to which cost is a barrier, using ABS data – see Borthwick and Roussel and Briant (2002).

### 6.3 Education and labour market disadvantage

The lifelong learning policy agenda is characterised by the assumption that individuals and employers will invest private resources in continuing education and training. Government initiatives that explicitly address the lifelong learning policy agenda, such as the creation of 'Individual Learning Accounts' (now suspended) in the United Kingdom, assume that both individuals and industries will invest in continuing education and training. However, most employers invest less in training for the low-skilled.

The market rewards from participation in education and training for people with low skills are much more limited than for people with high skills. This could contribute to lower rates of participation in education and training among low skilled workers. Among the limited number of low-skilled workers who engage in external work-related training courses, two-thirds pay for it themselves. People with low skills are the most likely to be disadvantaged in the labour market through low-waged and part-time jobs and lack of employer support for education and training participation. If Australia wants to achieve increased participation in education and training among people with low skills who are disadvantaged in the labour market, the government will have to provide assistance to overcome the market disincentives and structural barriers they face.

A low level of education and training participation in combination with a low skilled job may consolidate labour market disadvantage in Australia. However low-skilled jobs, most notably part-time, are not inherently 'bad' jobs. The extent to which a low-skilled, part-time job is associated with labour market disadvantage depends on the wage outcomes of the workers in those jobs taken in consideration with other factors. For example, an elementary clerical job offered on a part-time basis to a young student would reduce the opportunity cost of remaining in secondary school (Roussel and Murphy 2000). Similarly, for a person whose partner is in a well-paid full-time job, low-skilled part-time work offers flexible employment with few economic disadvantages. These categories of workers are not dependent on low skilled jobs for stable lifetime employment.

Before we assume that all workers in less-skilled jobs are disadvantaged in the labour market, we need more information about the education pathways of workers in low-skilled jobs. Many workers in low-skilled jobs (ie. students) would already be on an educational pathway leading to more highly skilled employment. Seven per cent of low-skilled workers are studying for a qualification. Roussel and Murphy (2000) note that the proportion of secondary students engaged in part-time employment has risen from 23 per cent in 1986 to 31 per cent in 1999.

On the other hand, low-skilled part-time jobs are 'bad' jobs for workers who rely on these jobs for their lifetime income. To a worker who has no other source of income, and limited resources to engage in self-funded education or training, a low-skilled part-time job provides a relatively tenuous link to the labour market.

The Australian economy is generating low-skilled jobs in the personal services and retail sectors. But unlike the low-skilled jobs in traditional manufacturing industries, the new low-skilled service jobs tend to be part-time, with poor wage outcomes. Individuals who rely on low-skilled jobs for their lifetime source of income are likely to be increasingly marginal to the labour market. These individuals may require ongoing forms of government assistance: to *find* work, to *re-train* for work or to *re-locate* for work.

It should not be assumed that participation in regular forms of education and training will improve the employment prospects of people who are unemployed and have low skills. Specific education and training policies need to be developed for people with low skills who are disadvantaged in the labour market and the effectiveness of these courses compared to alternatives such as job subsidies should be taken into account. Participation in successive courses of study without periods of employment appear to harm an individual's employment prospects, especially if they are women. Training courses for people with low skills who are marginal to the labour market should therefore be structured to maximise employment outcomes. Further research could identify the circumstances in which courses of study deliver better education and employment outcomes for marginal social groups.

## 7 Conclusion

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Structural change in the economy has seen the increased importance of human resource skills as an important intangible input to the value-adding process. Some theorists argue that workers' skills will be the main 'driver' of economic performance in the future. Regardless of theories about the sources of economic growth, the evidence of recent decades is that the fastest growing sectors of the economy employ workers with high levels of skill.

Australia has survived this period of rapid change quite well, experiencing relatively strong growth in the value-added services sector and growth in the employment of highly skilled workers. High proportions of Australian workers regularly upgrade their skills through continuing participation in education and training and increasing numbers of workers finance their own participation in external training courses.

However the increased value accorded to high skills in the economy has contributed to a widening socio-economic gap between people who participate in education and training and those who do not. This gap is likely to widen further if efforts are not made to increase the participation of groups who are currently under-represented in education and training, particularly people with low skills.

Australia's education and training system has been adequate to meet the economy's demand for high skilled workers to date. But this is no reason for complacency. Given the increasingly important role of skills in the economy, our education and training system needs to become more flexible and responsive to meet future requirements.

Promoters of lifelong learning should recognise that the idea of increased private investment in education and training—a feature of the lifelong learning policy agenda—could compound the barriers to participation faced by people with low skills if narrowly interpreted. Targeted and carefully evaluated programs of educational assistance are important if the educationally disadvantaged are to share more of the opportunities generated by the new economy, although education should not automatically be regarded as the only option for assistance.

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# Appendix A: Reich's three jobs of the future

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Reich presents an occupational classification based on the distinction between high volume and high value enterprises called the "three jobs of the future":

## (1) Routine Production Services

Routine production services are repetitive tasks performed by workers in high volume enterprises. These jobs tend to be

- Old blue collar jobs in textiles, metals manufacturing etc.;
- Routine supervisory jobs by low and middle level managers (foremen, line managers, clerical supervisors) who check work and enforce standard operating procedures; and
- Information processing jobs-entering data etc.

The workers in these jobs are required to read and do simple computations, but their cardinal virtues are reliability, loyalty and the capacity to take directions. These jobs are most vulnerable to being exported in response to price, or made redundant by new technology.

## (2) In-person Services

These jobs also tend to be routine and repetitive as well as supervised, but are provided person-to-person, and are therefore not sold world-wide. Examples are:

- Waiters and bartenders, child care and aged care workers;
- Ambulance, police, welfare, travel agents; and
- Dentists, doctors, lawyers.

The workers in these jobs also need to be punctual and reliable, as well as possess high level inter-personal skills. Reich argues that these jobs are more insulated from global competition, but are nevertheless associated with a country's standard of living and therefore are dependent on national economic prosperity.

## (3) Symbolic Analytic Services

The people employed in symbolic analytic occupations tend to solve, identify and broker problems by manipulating symbols ie. data, words, audio and visual images. Most of their work is conceptual, involving creative and critical thought. There are two categories of symbolic analysts: professionals and technicians.

Source: Reich Robert 1991 The work of nations. Preparing ourselves for 21<sup>st</sup> Century Capitalism. Alfred A Knopf, New York.

## Appendix B: Definitions of services sub-sectors

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Distributive services move commodities, information and people. Some of these services are final consumption in their own right (eg. holiday travel) but most are ancillary to final production.

Producer services are intermediate inputs to further production activities that are sold to other firms, although households are also important consumers in some cases. They typically have high information content.

Personal services provide final consumption for households and are characterised by direct contact between the consumer and the service provider.

Social (and collective) services provide final consumption for households and are distinctive for their non-market character in most OECD countries. Collective consumption decisions and public financing are common, as is production by governments, non-profit organisations and subsidised private organisations.

Source: A typology developed by Elfring used in *OECD Employment Outlook June 2000*: 83.

## Appendix C: Brief description of qualifications and occupations for ABS skills categories

Skill level	Occupational Groups	Brief Description of Skills
1	Managers and Administrators Professionals	Skill commensurate with a bachelor degree or higher qualification, or at least 5 years relevant experience
2	Associate Professionals	Skill commensurate with an AQF diploma or advanced diploma or at least 3 years relevant experience
3	Tradespersons and related workers Advanced Clerical and Service workers	Skill commensurate with an AQF Certificate III or IV, or at least 3 years relevant experience
4	Intermediate clerical, sales and service workers Intermediate production and transport workers	Skill commensurate with an AQF Certificate II or at least 1 years relevant experience
5	Elementary clerical, sales and service workers Labourers and related workers	Skill commensurate with completion of compulsory secondary education or an AQF Certificate I

ABS Cat. No. 1220.0 Australian Standard Classification of Occupations Second Edition 1997, ABS Cat. No. 6203.0 Labour Force Australia May 2000.

## Appendix D: Employed persons by industry and skill category

Employed persons, May 2000 (,000s)

	SKILL LEVELS					TOTAL
	5	4	3	2	1	
<b>Agriculture, forestry and fishing</b>	109.7	42.0	30.8	5.0	250.8	438.3
<b>INDUSTRY</b>						
Mining	4.2	26.5	20.3	6.0	18.8	75.8
Manufacturing	218.6	351.9	345.1	66.5	192.3	1174.4
Electricity, gas and water supply	5.1	14.4	19.3	11.8	17.0	67.6
Construction	102.2	103.1	394.8	39.2	68.3	707.6
<b>Sub-total</b>	<b>330.1</b>	<b>495.9</b>	<b>779.5</b>	<b>123.5</b>	<b>296.4</b>	<b>2025.4</b>
<b>SERVICES</b>						
<b>Distributive Services</b>						
Wholesale trade	59.3	184.0	57.9	39.5	96.8	437.5
Retail Trade	656.7	223.2	206.0	186.4	48.5	1320.8
Transport and storage	34.7	274.9	48.1	22.8	37.7	418.2
Communication services	42.0	56.7	28.9	22.5	30.3	180.4
<b>Sub-total</b>	<b>792.7</b>	<b>738.8</b>	<b>340.9</b>	<b>271.2</b>	<b>213.3</b>	<b>2356.9</b>
<b>Producer Services</b>						
Finance and insurance	5.4	136.6	53.7	86.3	54.7	336.7
Property and business services	166.1	159.4	138.6	141.7	417.1	1022.9
<b>Sub-total</b>	<b>171.5</b>	<b>296.0</b>	<b>192.3</b>	<b>228.0</b>	<b>471.8</b>	<b>1359.6</b>
<b>Personal Services</b>						
Accommodation, cafes and restaurants	104.1	185.4	36.2	116.9	7.4	450.0
Cultural and recreational services	37.3	50.7	27.9	38.5	64.0	218.4
Personal and other services	68.2	81.1	82.8	71.0	45.6	348.7
<b>Sub-total</b>	<b>209.6</b>	<b>317.2</b>	<b>146.9</b>	<b>226.4</b>	<b>117.0</b>	<b>1017.1</b>
<b>Social Services</b>						
Government administration and defence	34.2	117.9	36.9	44.4	113.5	346.9
Education	24.0	105.2	32.3	28.3	425.6	615.4
Health and community services	75.9	270.7	32.5	86.6	391.4	857.1
<b>Sub-total</b>	<b>134.1</b>	<b>493.8</b>	<b>101.7</b>	<b>159.3</b>	<b>930.5</b>	<b>1819.4</b>
<b>Services sub-total</b>	<b>1307.9</b>	<b>1845.8</b>	<b>781.8</b>	<b>884.9</b>	<b>1732.6</b>	<b>6553.0</b>
<b>Total</b>	<b>1747.7</b>	<b>2383.7</b>	<b>1592.1</b>	<b>1013.4</b>	<b>2279.8</b>	<b>9016.7</b>

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