



## Linking vocational education and training with industry in Australia and China

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Vocational Education Research

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The views and opinions expressed in this document are those of the author/project team  
and do not necessarily reflect the views of the Australian Government  
or state and territory governments

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# Key messages

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This report describes and compares the establishment, operation and take-up of collaborative activities between industry and vocational education and training in Australia and China.

- ✧ Country comparisons between Australia and China, in terms of industry and vocational education linkages sector, are not straightforward. They need to take account of major differences in individual country traditions, and the size of political, economic and educational structures and institutions. Nevertheless, it is clear that, because of its apprenticeship system, Australia has had a head start in establishing these linkages.
- ✧ Changing economic, political and educational philosophies of successive governments in China have affected the development of vocational education and its linkages with industry. Although there have been slight variations in the policies of different government regimes in Australia, the basic tenets of the need for industry and the vocational education sector to collaborate have remained the same.
- ✧ Industry bodies in China are generally interested in the welfare of their members, and are focused mainly on the training required by their particular sectors. There is a need to expand their scope of provision, so that the community as a whole can also benefit from industry-specific skills training.
- ✧ Australia and China are dependent on political and government interventions, in the form of infrastructure, funding and resources for expanding vocational education and encouraging industry participation in collaborative activities. However, the system of employer incentives for taking on apprentices and trainees is far more developed in Australia than China. The challenge for both countries is to ensure that government intervention enhances rather than hinders the development of industry–vocational education linkages.

# Executive summary

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When we talk about the linkages between industry and vocational education (VE) in China, or industry and vocational education and training (VET) in Australia, we are referring to activities which are mutually beneficial to all parties involved in the relationship. In this study we describe and compare the establishment, operation and uptake of collaborative activities or linkages between vocational education and training (referred to as VE in China and VET in Australia). We will argue that, in both countries, government has played an important role in driving these linkages. However, the forces and strategies for change at the operational level have been somewhat different.

## Similar purposes and considerations

Government policy and economic considerations have been largely responsible for introducing, maintaining or improving VE–industry linkages both in China and Australia. There have also been broadly similar goals for creating these linkages. These relate to ensuring that industry has workers with current skills, knowledge and other attributes.

Although government policy may provide a supportive political environment for these linkages, it is also true for both countries that successful collaboration requires willingness and commitment by local industry bodies and enterprises. It also requires adequate human and financial resources.

Although the major purposes and intentions of VE–industry linkages are similar in the two countries, there are distinct differences in the ways that each country has approached their development. These differences can best be understood in terms of historical events, and the adoption of different political and economic philosophies.

## Different historical influences

Although changes of government have also been associated with increased influence for different interest groups in Australia, fundamental aspects of political, social and economic systems in Australia have remained relatively stable. For China, however, changes in government regimes have been associated with changes in the fundamental operation of political, economic and educational systems and structures.

### *Australia*

Historically there has always been a tight connection between industry and vocational education and training. This connection is best demonstrated in the apprenticeship system, where employers sign a contract of training with apprentices, in which they promise to provide paid employment and on-the-job practical training. They also promise to give the apprentice time off during paid work to undertake specific courses, either at a training institution, or at the worksite. The apprenticeship system (for traditional trades) has existed in Australia since colonial times, and dates back to the British system of apprenticeships which was modelled on the craft guilds system of Western Europe.

Recent reforms to the Australian system of vocational education and training (including the apprenticeship system), as well as those which emphasised the importance of increasing VET–industry linkages have been driven by a number of political and economic events. These included the realisation, in the mid-to-late 1980s, that the rate of adoption of innovative



technology and work practices had not kept up with international standards and trends. The persistence of skill shortages in certain industries led to concerns about the adequacy of industry participation in skill formation, namely in apprenticeship training, and the training of specialists and technicians. In addition, increasing pressure was being felt in various industry sectors for changes to traditional ways of working, largely because of the extensive and pervasive changes that had also occurred in information technology and telecommunications. Reform was also driven by the rise of service industries and occupations that had hitherto not required formal training or qualifications and were increasingly requesting training and improved remuneration. Although the 1970s had seen increasing rates of school retention to Year 12 and movement into tertiary education, the 1980s and 1990s also witnessed the increased difficulties of young people in the full-time labour market. There was also a realisation that traditional academic pathways were not serving the needs of many young people.

In 1992 the government established the Australian National Training Authority (ANTA) whose role was to 'ensure that the skills of the Australian labour force [were] sufficient to support internationally competitive commerce and industry and to provide individuals with opportunities to maximise their potential' (ANTA 2004). ANTA was given responsibility for establishing an industry-led vocational education and training sector. The ANTA Board was to comprise leaders from industry. In 2004 the chairman was from the chemical manufacturing industry, while other board members were from the engineering, clothing, retail and property management industries, and the Australian Manufacturing Workers' Union. Recently the board was also expanded to take into account education and Indigenous representation. ANTA was abolished from 1 July 2005, and its responsibilities taken back into the Department of Employment, Science and Training. However, the industry-led nature of the Australian VET system will continue.

## *China*

Although there has also been a history of linkages between industry and VE in China, this history has been dramatically affected by events which have led to fundamental changes in the political, economic and social structures of Chinese society. The 1949 establishment of the People's Republic of China led to the nationalisation of the economy and highlighted the importance of combining education with productive labour. This initial period of the People's Republic of China emphasised the role of industry in vocational education by allowing schools also to be run by mines, factories, enterprises, railways and agricultural cooperatives. However, the Great Cultural Revolution between 1966–76 largely eliminated the linkages that did exist between industry and VE. Nevertheless, moves to restore the role of industry in education were recommenced in the early 1970s, with the announcement that specialised and skilled worker schools could be once again conducted by factories and mines. When, in the late 1970s and mid-1980s, government focus shifted towards economic reconstruction and the 'open door' policy, VE institutions were restored, and active linkages with industry were once again emphasised. The incorporation of field practice (in Australia often called work placements) in enterprises and the establishment of school-run enterprises were once again considered as essential to ensuring that students developed appropriate industry skills. The establishment of plans for five national specialised teaching groups represented a collaboration between specific industry sectors (architecture and construction, commerce, garment, tourism and electronics industries). The evolution of a market economy and its associated expansion of enterprise ownership created an environment where it was difficult to maintain the traditional boundaries between administrative government departments and other social agencies. Nevertheless, the institution of 33 industry–VE supervision committees confirmed the government's commitment to encouraging industry–VE linkages.

These events culminated in the passing of the *Vocational Education Law* in 1996, which urged VE institutions to maintain close ties with enterprises so that trainees could acquire necessary practical skills. However, concurrent reforms of state council ministries responsible for industry weakened the ability of these ministries to enforce industry cooperation with VE. Reduced availability of jobs, surplus of job applicants, and the ability of enterprises to recruit directly from the labour

markets have also reduced the need for enterprises and industry to maintain close linkages with the VE sector.

## Different value systems

There is a higher premium for academic education by comparison with vocational education in both countries. However, due to historical, political and cultural traditions, there has been a higher value placed on vocational pathways (especially trade and technician training) in Australia than has been the case in China. Chinese traditional education historically prized academic scholarship above other forms of training, as it was the main pathway to high government positions. The operation of these value systems have and will continue to affect the willingness of industry to commit themselves to collaborative activities with schools and other vocational education institutions.

## Different educational philosophies

In Australia the introduction of competency-based training (CBT) as the main training methodology to be used in VET, and the development of competency standards to guide the assessment of skills required in the workplace have been heavily dependent on increased collaboration from industry. For its part, the VET system has also increased the flexibility of its provision, so that clients (including employers purchasing training for their employees) have more say in how, when and where they do their training. The main focus for VET in Australia has been the acquisition of relevant industry skills and knowledge. Although one of the major objectives for VE in China is that it must provide industry and individuals with relevant skills, there is a greater focus on the all-round education of individuals, so both industry-specific skill and individual talents are developed. There is also an increased focus on ethical behaviour.

Another major difference between the two countries is the involvement in China of teachers and schools in scientific experimentation, and industrial production. Although there are some cases where individual or groups of teachers are involved in commercial consultancies which may involve the development of new products and services for clients, scientific experimentation is not a major role of VE teachers and institutions in Australia. In addition, although school-based entrepreneurial activities (for example, training restaurants, aquaculture farms, vineyards, to name but a few) are also evident in some Australian VET institutions, these activities are not generally major income or profit-producing ventures.

## Different concepts of industry involvement

Although the interests of industry organisations and associations in Australia and China lie in the protection of the rights of their members, it is clear that in China another major role is to undertake activities prescribed to them by government. Industry associations and organisations in the Australian context generally operate as free agents. Nevertheless, government has determined that the VET sector is to be an industry-led system. It has amalgamated the former industry training advisory bodies into ten industry organisations (industry skills councils). The role of these councils is to advise government on industry trends and to develop and review the industry competency standards, assessment guidelines and qualifications associated with identified occupations and pathways for their industries. Another way that the Australian Government gets cooperation from industry is to make funding available for the provision of training in the form of incentives for employers who decide to employ apprentices and trainees. Moreover, although industry organisations and associations are not connected to governments, they are also mindful of developing close networks (through lobbying and other activities) with influential bodies to ensure that their industry voice is heard.

## Different models of collaboration

Apart from apprenticeships, which are based on a legal contract between employer and apprentices (or their guardians), both industry and VET institutions in Australia are free to develop their own networks and linkages. This flexibility means that there are many different forms of collaboration. They may range from industry providing schools with opportunities for work placements for students and their teachers, to providing industry specialists for teaching and assessment, funding, equipment, materials and venues, that will assist schools to provide relevant training. Alternatively, schools may provide industry with customised training programs for existing workers. A variety of such collaborative activities between industry and schools is also evident in China. However, there are some Chinese collaborative activities that are not observed in Australia. For example, in Australia there is no opportunity for industry to come into schools to participate in management, and there is no tradition of industry evaluating teachers. However, there are opportunities for industry to evaluate their satisfaction with training programs through customer satisfaction feedback surveys conducted by schools, or at the national level through the Survey of Employer Views on Training.

Ensuring that teachers have both industry-specific skills and teaching qualifications has also been important for both countries. Teachers in the secondary school sector in Australia who already have their teaching qualifications must acquire some workplace experience to enable them to conduct some VET courses. For teachers in the post-school sector, the situation is reversed. The systems in all states have concentrated on hiring teachers with industry-specific qualifications and experience to teach courses (especially the case in traditional trade areas). During the last decade such teachers have been expected to undertake teacher-related qualifications and programs.

## Conclusions

It is clear that, in Australia and China, effective industry–vocational education linkages have benefits for industry, governments, vocational institutions, and students. They can be useful mechanisms for identifying industry skill needs, and for developing appropriate guidelines and/or materials for the delivery of education, training and assessment to meet these needs. They can enable students and existing workers to develop the skills required to enhance their own fortunes in the labour market and to provide industry with the skills and knowledge required to make it competitive. Such collaborations also make it easier for governments to implement reforms designed to improve economic and educational outcomes, and for industry to fulfil their community responsibilities. The challenge is not to lose sight of the core purposes of business and schools and to develop activities which enable each to fulfil these purposes.

A number of policy issues can be identified from this study. In both countries they relate to having adequate funding and other resources in place to support the establishment and maintenance of these linkages. Most importantly, policies must be based on the accurate identification of industry skill shortages, and suitable training responses.

# Introduction

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When we refer to vocational education and training (VET)–industry linkages in the Australian and Chinese contexts, we are referring to collaborations between educational institutions providing vocational education and training and industry sectors. These collaborations aim to provide mutual benefits for each party. In Australia and China, the term ‘industry’ is used to describe categories of businesses, people and organisations making similar products or carrying out similar services.

This study examines linkages between VET and industry in Australia and China with a view to identifying strategies for improving their effectiveness in both countries. Causal connection between increased industry–VET collaboration and successful employment and training outcomes of students and existing workers is difficult to confirm. However, increasing the connections between the industry and training sectors is intended to ensure that training is relevant, up-to-date and tightly connected to labour market needs.

## Historical connections

Historically there has always been collaboration between training and industry sectors in Australia. This has been most evident in the training of apprentices, with roots dating back to the English craft guilds system of the Middle Ages. However, these connections have become more pronounced and widespread during the last two decades. The major stimulus for increasing the collaboration between industry and the VET sector has come from the Australian (national) Government as it responded to skill shortages and economic and social pressures posed by globalisation. Such pressures have also required industry to review traditional approaches to skills formation, and to accept an enhanced role in training reform.

Although there has also been a history of vocational education (VE)–industry linkages in China (with apprenticeships observed as early as the Shang Dynasty of 1700 to 1100 BC), the extent of such connections has fluctuated across different periods, according to changes in political and economic philosophies. However, they have increased more rapidly during the late 1970s, when the Chinese Government’s political reforms and ‘open door’ policy led to the expansion of the Chinese economy. These reforms also prompted an increased interest in modernising the VE sector, which in turn required the development and maintenance of successful linkages with industry.

## Forces for change

By the mid-1980s, it had become clear that Australia’s economic performance by international standards needed to be improved. Moreover, the rate of adoption of innovative technologies and work practices was not keeping up with international trends. In addition, widespread changes in technology and telecommunications had exerted increased pressure for change in all industry sectors.

The need to ensure that industry remained economically competitive also set in train the review of current arrangements for skill formation. In addition, continuing skilled labour shortages called into question whether or not industries were engaging in sufficient apprenticeship training, and training of specialist technicians and professionals. Other forces for reform included the increasing importance of service industries and occupations for which there had been little formal training,

and the push from some industry sectors, such as community services, for qualifications and improved remuneration.

The declining fortunes of young people in the full-time Australian labour market increased demand for post-compulsory education; declining numbers of youth taking up traditional apprenticeships also exerted pressures on the government to reform VET. Although demand for post-compulsory education and retention to Year 12 had dramatically increased since the 1970s, there was a realisation that traditional academic pathways were not serving the needs of the great majority of young people.

These forces culminated in the development of the present Australian vocational education and training system and was predicated on a close relationship between VET and industry. In 1992 the Australian National Training Authority (ANTA) with a board comprising leaders from industry was established. This means that industry had and continues to have a major role in determining the skills and knowledge that will be required for many occupations and in working with training providers to deliver on-the-job training to new and existing workers. Although ANTA was abolished in 2005, the responsibilities for industry to provide leadership for the VET sector remained.

In trying to understand the forces for change in the Chinese context, it is important to understand how economic and social structures and institutions were altered when China opened its door to the west and began its transition from a planned economy to a market economy. In addition to restoring a focus on vocational education, these changes were also designed to facilitate industry associations and organisations and enterprises operating as vital players in the new market economy. Industry organisations and associations in China have also undergone a complicated history. It began to flourish after the Opium War, then became gradually weaker with the establishment of the People's Republic of China until it eventually disappeared. With the introduction of economic reforms and the open-door policy, and subsequent development of the Chinese economy, the industry organisations and associations re-appeared and became stronger. In addition, increasing numbers of overseas industry organisations and associations also entered China, mainly clustering around major urban areas such as Beijing, Shanghai and Guangzhou. For example, Australia has established a tourism association in Shanghai, which is responsible for promoting its rich tourist resources and programs. Today there are about 39 000 industry organisations and associations in China. A major aim of these associations is the education and training of their members. They are also expected to play a role in the development of occupational standards and grading of occupations.

In the Chinese context (*Cihai* 1980 edition)<sup>1</sup>, enterprises are independent businesses engaged in industrial production, transportation or service provision. They may include factories, mines, railways, and trading companies and modern companies in emerging industries. They are also to be found in industrial, agricultural, transport, building and installation, postal and telecommunication, sales, tourism, and financial industries. From the 1980s onwards, the Chinese Government implemented a number of reforms which enabled enterprises to become legally established profit-making organisations able to trade in their own names.<sup>2</sup> Based on property law, organisational structure and responsibility, three basic types of enterprises have emerged. There are independent finance enterprises, partnership enterprises, and companies. An independent finance enterprise is an

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<sup>1</sup> *Cihai*, Shanghai Dictionary Press, 1980 (First edition).

<sup>2</sup> *Independent Enterprise Law of the People's Republic of China* (passed by the Eleventh Standing Committee of the Ninth National People's Congress on 30 August 1999).

*Partnership Venture Law of the People's Republic of China* (passed by the Twenty Fourth Standing Committee of the Eighth National People's Congress on 23 February 1997).

*Corporate Law of the People's Republic of China* (passed by the Fifth Standing Committee of the Eighth National People's Congress on 29 December 1993, and revised by the Thirteenth Standing Committee of the Ninth National People's Congress on 25 December 1999).

*All-People Ownership Industrial Enterprise Law of the People's Republic of China* (passed by the First Session of the Seventh National People's Congress on 13 April 1988, and released as No.3 Order of Chairman of the People's Republic of China on 13 April 1988).

enterprise financed by one investor who administers the business and has exclusive responsibility for the enterprise's financial position. A partnership is an enterprise where one or more partners signs an agreement to share interests and responsibilities for investment and finance, business management, profit-making and risk-taking. A company is a profit-making corporation established according to regulations of the corporate law.

Historically, industry and enterprises in China were administered by government departments. In making the transition from a traditional planned economy to a socialist market economy, industry associations and organisations and enterprises will take on a greater role in the development of the national economy.

## Industry sectors

In Australia, the classification of industries is based on the ANZSIC (Australian and New Zealand Standard Industrial Classification) system. There are 17 divisions used to provide a general picture of the economy. Each division comprises subdivisions, groups and classes. There are 53 subdivisions, 158 groups, and 465 classes (ABS & Department of Statistics New Zealand 1993).

In China the classification of industries is based on the 'The Classifications of Industries for the National Economy'<sup>3</sup> released in March 2002 by the China National Planning Committee, National Statistics Bureau and National Standards Committee. Within these sectors there were to be 95 large divisions, which comprised 395 further classifications, in turn divided into 912 smaller categories.

Although the Chinese industry classification system uses slightly more division classifications than the Australian system (20 versus 17 respectively), the types of industries covered are broadly similar. However, there are variations in the way that industry sectors are combined or kept separate, and the way sectors are highlighted for separate treatment (for example, international organisations). This is understandable, given the importance such organisations have for economic development in China. Table 1 maps the two different classifications in terms of broad divisions.

## Organisation of the remainder of the report

The following sections provide a history of the collaboration between VET and industry. They include a description of the forces which have led to the establishment of closer linkages between the sectors, and the types of relationships that have resulted. The report ends with a comparison between Australian and Chinese VE–industry linkages.

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<sup>3</sup> A notice of the National Statistics Bureau about releasing 'Regulations on the Classification of Industries', guo tong zi No.14 (2003), 14 May 2003.

**Table 1: Australian and Chinese industry classification divisions**

Industry classifications	
Australia	China
Agriculture, forestry and fishing	Agriculture, forestry, animal husbandry and fishing
Mining	Mining
Manufacturing	Manufacturing
Electricity, gas and water supply	Production and distribution of power, gas and water
Construction	Construction
Transport and storage	Traffic, transport, storage and post
Communication services	Information transfer, computer services and software
Wholesale trade	Wholesale and retail trade
Retail trade	
Accommodation, cafes and restaurants	Accommodation and restaurants
Finance and Insurance	Finance
Property and business services	Property and real estate
	Tenancy and business services
	Scientific research, technical services and geological prospecting
	Management of water conservancy, environment, and public facilities
Personal and other services	Resident services and other services
Education	Education
Cultural and recreational services	Culture, sports and entertainment
Health and community services	Sanitation, social security and social welfare
Government administration and defence	Public management and social organisation
	International organisations

Industry has a long track record of being involved in training apprentices in the traditional trades in Australia. Its involvement in training for a broader range of occupations has been more recent.

## Historical connections: The training of apprentices

Linkages between VET and industry have been most significant in the Australian apprenticeship system. These connections have their roots in the training provided for the trades by the British craft guilds of the Middle Ages.

In this system artisans in a community or town in medieval Britain (and in other Western European countries) would come together to form a craft guild. The guild provided them with industrial protection by prohibiting craftsmen who were not members from practising the craft and selling their goods and services in the town.

Typically, a craft guild would comprise masters, journeymen and apprentices. Masters owned small businesses and the raw material and the tools used to produce goods for profit. Journeymen were qualified apprentices who had completed their indentures but had as yet to become master-craftsmen and belong to the guild in their own right. Apprentices were often young children (sometimes as young as nine years old) who learned the trade from the master or from the journeyman. The apprentice was bound to the master by form of indentures, a legal contract that listed the very specific obligations of the master and the apprentice. Often these meant that the owner had to house, feed and clothe the apprentice and provide the training. The apprentice was to do what the master said, and not to bring the reputation of the master into disrepute by any bad behaviour in the community.

These traditional forms of apprenticeship provided a close connection between training and industry, and because the indentures dealt with the employment of children, they were also subject to law. These traditional forms were exported to the Australian colonies. Today indentures (now generally called contracts of training) for apprentices still remain. Although not as prescriptive about the moral conduct of apprentices and employers, these contracts still outline the obligations of the employer to provide apprentices with on-the-job training and time off work to engage in any required off-the-job training. The contracts also require apprentices to participate in work tasks and to undertake the required training.

The Industrial Revolution in Britain of the 1870s was to see the gradual demise of the craft guilds system and training of apprentices gradually taken up by the factory system. Here trade unions would take over the role of protecting the welfare of tradesmen and women by controlling the recruitment of apprentices. Today trade unions continue to be responsible for the formal protection of the traditional trades and have fought hard to ensure that certain minimum qualification standards and levels of experience are adhered to before apprentices can be fully qualified as tradespersons. Representation of trade unions on committees for national reform of training has been significant.

By the end of the nineteenth century, and well into the twentieth century, the apprenticeship systems of each of the Australian states were well established. Although these systems were separate, there were many similarities, and each of the states enacted laws to govern hours of work, rates of



pay, rights to other benefits, and disputes resolution arrangements. Employers and unions were represented on apprenticeship boards, and industrial regulations were enacted to ensure that the rights of apprentices and their employers were safeguarded.

During the Second World War ‘dilutees’ were used to meet the acute skilled labour shortages caused by the involvement of skilled tradesmen and women in military service.<sup>4</sup> Apprenticeships, supported by unions and employers, continued as the main system for qualifying tradespersons during the post-war period.

Up until the 1930s or thereabouts, the training of apprentices in Australia was mostly done on the job. Here employers, who had often once been apprentices themselves, provided the employment, the training and the experience which would enable the apprentices to acquire their trades certificates. However, off-the-job technical training to accompany the traditional on-the-job training was soon introduced. Indentures were modified to reflect the employer’s obligation to give the apprentice time off work to attend such courses. This tradition of technical off-the-job training by external training providers continues today for the great majority of apprentices in the traditional trades. However, there are certain trade occupations where all training is still provided on the job.

As already noted, the different states had developed separate apprenticeship training arrangements and regulatory frameworks, albeit with substantial similarities. The separate apprenticeship training systems continued to provide difficulties for the portability of qualifications and licences across state borders. Such disparity led to attempts to promote a more nationally coherent approach to the training of apprentices, with the establishment in 1957 of the first of a successive series of national bodies dealing with apprenticeships (the Australian Apprenticeship Advisory Committee).

In addition, the Commonwealth Government began to intervene in apprenticeship training by providing financial support for the training of apprentices in country areas, and living-away allowances for country apprentices who needed to move to the cities. Interventions of this type have continued up to the present time, as the government has tried to increase the number of apprentices.

## The impact of economic recessions

The training of Australian apprentices has been especially vulnerable to fluctuations in the economic prosperity of the nation, with numbers of apprentices rising in good times and dramatically declining in bad times. Historically, Australia had also relied on bringing in skilled and unskilled migrants to augment its labour force. However, prosperous times make it easier to attract migrants. In the prosperous and stable economy of the 1950s and 1960s, over two-thirds of the labour force were born overseas. By the early 1970s, however, the country experienced problems with its balance of trade, which in turn drove up inflation and unemployment. Increasing oil prices also had a negative effect on the economy.

The economic recession of the early 1970s led to high unemployment, particularly of young people. Consequently, the national government offered employers extra incentives to put on additional apprentices. These incentives led to rapid growth of apprenticeship numbers in the traditional trades (metal trades, building trades, electrical trades, food trades and vehicle trades). In 1973 the Commonwealth Government established the National Training Council to expand industry training. Industry training committees were set up to facilitate this process. These committees were to become the forerunners of a network of national industry training advisory bodies which in turn have evolved recently into industry skills councils.

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<sup>4</sup> Industry used ‘dilutees’ (mostly women) to meet these shortages. These ‘dilutees’ had some of the technical skills and experience that were required. During the post-war period the government implemented a scheme to retrain returning servicemen. In addition, the *Tradesmen’s Rights Regulation Act 1946* was passed to protect the rights of tradespersons (in the metal, electrical and footwear trades) who had returned from the war from ‘dilutees’, in addition to protecting their jobs from the influx of skilled immigrants from post-war Europe.

Subsequent recessions of the early 1980s and 1990s were to see reductions in the number of apprentices. In addition, there was a continuing decline in the labour market for young people. The unemployment rate for 15 to 19-year-olds was 3.2% in August 1970. By August 1983 it had increased to 22.6%. In 1992 it reached a historic high of 25%, and although the youth labour market has improved in recent years, the unemployment rate for 15 to 19-year-olds in August 2004 stood at 16.3%. However, these figures are a little misleading. Keeping in mind that a great proportion of this age group is still at school, the actual ration of those who are unemployed in this age group and looking for work stands at 4.4%.

In view of persistent unemployment for younger age groups, and declining numbers of apprentices, the Commonwealth Government implemented a range of programs and incentive schemes to encourage employers to create employment opportunities. The first of these was announced in 1994 under the white paper, *Working nation*.<sup>5</sup> Although incentives have been used to promote apprenticeships in times of economic downturn, they have not reduced these in times of economic boom.

## New forms of employment arrangements

In response to declining commitment of employers to take on apprentices, a new form of employment arrangement, the group training company, was introduced. The group training company employs apprentices and trainees and hires them to other businesses, called host employers, who provide the practical experience and on-the-job training. The model was first adopted by the building and motor repair industries in 1979, but increasingly became important for many industries (Misko 1997; NCVER 2001b). Although group training companies were originally established to increase skills development for different industries, their expansion during the 1980s was also driven by the need to increase job opportunities. Today there are about 200 group training companies with responsibility for employing apprentices in the traditional trades and trainees for other industry sectors. Group training companies operate in all Australian states. Some specialise in servicing a particular industry, while others may cater for an entire region, covering many industries.

In most cases group training companies consult with training providers to set up a schedule for off-the-job training. Group training companies who have been accredited to provide the off-the-job training will also provide this training themselves.

Group training enabled small and medium-sized businesses that are often unable to offer a new apprentice a position, to participate in apprenticeship training. Such firms may not have been able to offer a position to a new apprentice because they could not guarantee ongoing work, or might not have the range of work to enable an apprentice or trainee to gain all the necessary job skills for that industry. The group training company took up these responsibilities by acting as the employer and taking responsibility for all the costs and administration associated with the apprentice (for example, wages, holiday pay, sick pay, superannuation, workers' compensation).<sup>6</sup>

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<sup>5</sup> In May 1994 the then Prime Minister, Paul Keating launched the Working Nation raft of policies (Commonwealth of Australia 1994). These were intended to ensure employment and growth. In terms of training these reforms aimed to accelerate reforms in vocational education to provide employment opportunities for all young people. These included improving the content and relevance of training by basing it on consultations with industry, and providing industry with a lead role in determining training directions. VET was also to be based on what individuals could do rather than on the time they had spent in training. It also included offering young people alternative pathways to employment and training (including traineeships in schools, TAFE and industry) which could be used as they were required at different life stages. The working paper outlined reforms which would increase opportunities for groups from disadvantaged backgrounds and would enable adults to enter apprenticeships and traineeships for the first time.

<sup>6</sup> Small and medium-sized enterprises may not have been able to undertake all employment and training functions. To counteract these limitations, group training companies also adopted the concept of rotating apprentices among different enterprises. However, there remain companies who prefer to keep the same apprentices for the duration of their apprenticeship term.

## New forms of structured vocational training

In 1985 the Kirby review (Kirby 1985) investigated the extent to which training arrangements were meeting the needs of the economy and of different groups in the community. The review found that the fortune of apprentices was dependent in a major way on the health of the economy, and that structured training was concentrated in the traditional trades. Apart from hairdressing, apprenticeships were generally reserved for young 'able-bodied' males. This meant that there were few examples of training in new and growing areas of the labour market. It also meant that there were few opportunities for training for those young people who were leaving school at or before Year 10 and were not in an apprenticeship pathway.

The review led to the establishment of the Australian Traineeship System. This system aimed to provide young people of school leaving age not in a vocational pathway (apprenticeship) with a structured training program. This structured training program would provide training for young people in non-trade areas (for example, the financial services industry, retail industry, and government services). These traineeships would take about 12 months to complete and include a minimum of 13 weeks of off-the-job formal training. This could be taken in block release or in two-days-a-week arrangements. These traineeships were based on linkages established with employers. Here employers would generally provide the employment experience and on-the-job training and supervision, while the training provider would deliver the off-the-job training. Employers would not be liable for the amount of time trainees spent in training off the job, and trainee wages would be 75% of the wage of a worker of similar age (Kirby 1985).

With time, the traineeship system was to expand into different industry sectors, and enable employers to provide for all of the training on the job. To be effective, these fully on-the-job programs required increased collaboration between employers and VET providers.<sup>7</sup> A number of state reviews of these systems have highlighted the variable quality of these arrangements, with some employers and VET providers showing high commitment to their training roles, and others showing inadequate support and commitment (Schofield 1999a, 1999b, 2000; Smith 2000; Department of Education, Training and Employment [South Australia] 1999; Misko 2002).

## The impact of higher school retention

Since the mid-1970s, the Year 12 retention rate of students in secondary schools has dramatically increased. For example, where just 23% of school students stayed on to finish high school in 1967, this rose to 35% in 1977, and 53% in 1987. By 1992 the retention rate had risen to 77%, although it has fallen somewhat since (Department of Employment, Education and Training 1991; ABS 1997). Despite an increased demand for higher education among school students, it was also clear that the majority of students were not bound for university, and that other pathways needed to be considered and enhanced (Commonwealth of Australia 1994). Higher Year 12 retention rates also meant that school leavers were entering the workforce at a later age. This was to have repercussions on the numbers interested in taking up apprenticeships.<sup>8</sup>

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<sup>7</sup> There were different state and territory regulations for the administration of these new fully on-the-job apprenticeships that generally comprised the shorter duration arrangements. Nevertheless, a typical approach was to require employers to work in conjunction with a registered training organisation (that is, an accredited training provider) to deliver and assess the training. A mentor from the registered training provider was allocated to the trainee, and was expected to make regular visits to the site to monitor the training, conduct and or validate assessments and consult with employers and trainees. The qualification would then be awarded by the registered training organisation. Although the majority of the training and assessment for these traineeships was workplace-based, there was provision in many jurisdictions to allow a small part of the training (say 30%) to be done externally if the employer could not provide the necessary expertise or equipment.

<sup>8</sup> When young people enter the labour market at an older age they may not be attracted to the prospect of working for a training wage which is in most cases considerably lower than the income they could received in full-time employment.

These developments have also led to the expansion of formal linkages with industry for the delivery of vocational training in schools. This has included the introduction of school-based part-time New Apprenticeships, which allow students to commence an apprenticeship or traineeship while still at school and also complete their secondary school certificates. It has also led to increased availability for school students to undertake accredited VET courses. This has necessitated schools establishing formal relationships with industry to provide required on-the-job training and assessment for the completion of qualifications, and the establishment of formal administrative structures for accessing jobs for apprentices and trainees and work placements for other students. In 1994, the national government launched the Australian Student Traineeship Foundation to develop and support structured workplace learning programs across Australia. Such programs were felt to increase the opportunity for students to acquire industry experience to enable them to better make the transition from school to work. In addition, it was felt that it would provide some relevance to schooling for those students who were at school but not university-bound. Funding from the Australian Student Traineeship Foundation enabled schools to develop linkages and partnerships with local industry and communities to help their students access workplace training and experience.<sup>9</sup>

## The impact of globalisation and new technologies

By the early 1980s the national government intensified concerns about Australia's declining standing in the world economy, in terms of declining balance of trade with trading partners and low levels of productivity growth. For example, a report prepared by the Department of Employment, Education and Training (1987 [now the Department of Education, Science and Training]) indicated that, between 1962 and 1982, real gross domestic product per person employed increased by an average rate of 1.8% in Australia. The rate over the same period was 6.2% for Japan, 3.8% for France, 3.4% in Germany, 2.2% in the United Kingdom and 1.2% in the United States. Furthermore, Australian adoption of new technology for export goods and services was also behind that of all Organisation for Economic Co-operation and Development (OECD) comparators with the exception of Iceland. In contrast, almost two-thirds of imports were value-added goods and services. That is, they were produced with high levels of technology (Department of Employment, Education and Training 1987).

In 1986 the Australian Council of Trade Unions undertook a fact-finding mission to Sweden, Norway, Austria, West Germany and the United Kingdom. The mission, endorsed by the government's Trade Development Council, comprised the most senior available officers of the Australian Council of Trade Unions and its affiliated unions. The aim was to gather information on approaches which had been successful in achieving low unemployment, low inflation, and sustainable, equitably distributed economic growth (Australian Council of Trade Unions 1987). The mission found that, although countries like West Germany and the United Kingdom had achieved low inflation and good economic growth, it was countries like Sweden and Austria which provided the most important lessons for Australia. These countries had been able to achieve successful outcomes in terms of improved balance of payments, low unemployment, low inflation and good economic growth, while at the same time preserving social cohesion and an increased balance in regional growth. In Sweden skill formation was especially aided by applying considerable public and private resources and funding to training and retraining. In addition, all of the countries,

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<sup>9</sup> This structured workplace learning was linked to their school studies, and also 'reflected the needs and interests of employers' (Enterprise and Career Education Foundation 2002, p.4). The Australian Student Traineeship Foundation evolved into the Enterprise and Career Education Foundation, which today continues the work of its predecessor but has broadened its mandate. This is to 'develop a system that ... assists ... young people to develop the skills and knowledge they need to make informed choices about their futures and secure successful transition from school to adulthood ... and for ... meeting the challenges of the 21st century' (Enterprise and Career Education Foundation Annual Report, 2002, p.3). This has meant that it has continued to 'broker' alliances between schools, industry and the wider community, and to increase awareness of the multiple and diverse pathways that students can follow once they leave school. The foundation has been disbanded as a separate organisation and has now become a core responsibility of the Department of Education, Science and Training.

except the United Kingdom, had adopted the principles of industrial democracy. These principles emphasised employee representation on company boards, employee access to corporate information, and sufficient consultation with unions before any implementation of major change. In Sweden and Norway there was extensive use of consultative committees or their equivalents, which dealt with issues such as structural change, skill development, innovation, work organisation and investment (Australian Council of Trade Unions 1987, p.xiii). The mission also noted the need to reduce the number of unions into a few major unions to increase their effectiveness. Comparisons such as these helped to highlight the historical deficiencies of Australian industry. They paved the way for economic reform aimed to help industry become economically competitive, both at home and abroad.

## Modernising industry

The government of the day implemented policies to gradually drop tariff protection policies, deregulate financial markets, form partnerships (accords) with unions to provide industrial harmony to achieve industry reform, and adjust business taxation regimes. The reforms drove industry to change traditional ways of working, upgrade and modernise manufacturing technology and equipment and facilities, and introduce changes to the way work was organised. Historical and narrow demarcations within and between traditional occupations needed to be streamlined, and industry awards restructured. In such an environment many industries increased their demands for workers with a higher and broader level of skills and knowledge at all levels, and decreased requirements for workers for unskilled, repetitive and standardised production work. In response to these expectations trade unions also called for the adoption of modern forms of work organisation which provided all workers with broader skill sets, career progression, and increased individual and work team responsibility. They also demanded opportunities for increased employee participation in decision-making (the September 1989 National Congress of the Australian Council of Trade Unions). The reforms also led to the decentralisation of arrangements for industrial relations.

## Decentralising industrial relations arrangements

Changes to the system of industrial relations were to be critical features of the new workplace. Historically, the conditions and remuneration of Australian workers were negotiated by employers and unions. Disputes were resolved by a centralised government system of bargaining and arbitration. In 1996, the government passed the *Workplace Relations Act* which gave employers and employees within enterprises (workplaces) the responsibility for deciding on conditions and remuneration. These certified enterprise agreements can be negotiated collectively between employers and employees, or where employees in an enterprise opt for a union agreement, employers and unions. The 1996 act also allowed employers to negotiate directly with individual employees. In these agreements (called Australian Workplace Agreements) employees may also opt to have their union represent their interests, and act as a bargaining agent. Between January 1977 and 31 December 2003 there were 47 029 certified enterprise agreements. During the same time there were over 424 000 Australian Workplace Agreements signed.

## Improving the national skills base

Adjusting the structure of the economy to improve productivity required both modernised plant and equipment and a skilled and adaptable workforce. However, continuing skilled labour shortages (especially in key engineering, information technology and manufacturing industries and service industries important to the tourism industry) provided a further indication of the inadequacy of training effort by certain key industries and occupations. An OECD report on the Australian economy (Dahrenhorf Committee 1986 cited in Department of Employment, Education and Training 1987) had also raised problems about the quality of the national skills base and the need to review arrangements for the formation of skills in industry and in the education and training sector. The importance of education and training to the development of a flexible workforce and therefore economic wellbeing was also determined in part by the view that 'world's most successful

economies of the past two decades ... had focussed on the tight connection between ... education, skills and industry commitment' (Department of Employment, Education and Training 1987, p.3).

Reviews of existing apprenticeship training arrangements highlighted that, with some slight modifications, the model 'remained sound'. However, concerns were raised about the narrowness of apprenticeship training, and lack of flexibility regarding the duration of apprenticeships, age of entry, and acknowledgement of prior learning. There was also a view that the traditional focus on 'front-end training' had neglected the importance of adult training and re-training (Department of Employment, Education and Training 1988). Furthermore, the traditional monopoly on apprenticeship training held by the public provider, TAFE (technical and further education), was eventually to be diminished by opening up this training market to an increased range of providers. In view of increased competition from other providers, TAFE institutes began to protect their turf by increasing their linkages with industry by customising training for entry-level and existing workers to suit industry needs. Once again it was government policy that drove these reforms (Commonwealth of Australia 1994).

## The rise of the service industries

Another force for expanding the range of VET–industry linkages was the changing industry structure of the Australian economy and the growth of the service-based industries. Between 1984 and 1987 most of the employment growth was attributable to five service sector industries (Department of Employment, Education and Training 1987). These included property and business services, recreation, personal and other services, construction, wholesale and retail trade, and community services. In 2004 these industries accounted for 66.1% of the total share of employment (ABS 2004). Apart from the construction industry, which historically had formal and structured training arrangements through the apprenticeship system, many of the occupations in the other sectors were not supported by formal vocational training pathways and qualifications, and therefore provided an area for further reform.

## The development of the national VET system

The forces just described have culminated in the development of the present Australian vocational education and training system predicated on a stronger relationship between VET and industry across all sectors and nationally.<sup>10</sup> That industry was take the lead 'in developing and contributing to entry-level training' (which at that time went under the umbrella term of the 'Australian Vocational Certificate Training System') was specifically outlined in the *Working nation* white paper (Commonwealth of Australia 1994, p.101).<sup>11</sup>

The need for this overarching national training system can also be traced back to the difficulties engendered by a federal system of political government where states and territories have maintained the major responsibility for education and training. As already noted, this has led to differing education and training arrangements and licensing and accreditation requirements for many industries. Such divisions had made it often difficult to transport qualifications and licences (especially vocational qualifications) across state and territory borders. Nationally consistent training and assessment arrangements were felt to be necessary to increase the mobility of labour and to

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<sup>10</sup> Although the system for the training of apprentices and trainees has undergone a number of name changes as it has expanded its scope and coverage, today the system is formally called New Apprenticeships.

<sup>11</sup> It noted that industry would own the system and its day-to-day administration which would be streamlined to meet industry needs, and that government would contain its role in coordinating arrangements, quality control and change management. The Commonwealth Government was also to negotiate with the states about industry representation on the National Training Board. A training stream for large enterprises was also supported. Here large enterprises developed their own competency standards, and when these were endorsed, they could develop accredited training programs and issue their own national qualifications.

enable individuals to upskill their qualifications as their needs and situations changed. The development of a nationally consistent VET system required the close involvement of industry. Although difficulties with transportability of qualifications and licences have diminished to some extent, they continue to provide frustration for specific industries and for VET.

The Employment and Skills Formation Council was charged with the development of a new apprenticeship and traineeship system and designing a new entry-level training system.<sup>12</sup>

Closer linkages between VET and industry have also been cemented by the adoption of a competency-based approach to skill development, in which the advice and support of industry is central. Although government has played a crucial role in pushing for an overarching national VET system, the collaboration of industry in terms of accepting an increased formal role has been essential.

In 1990 the Commonwealth and state and territory ministers of vocational education employment and training established the National Training Board. The role of the National Training Board was to establish formal linkages with industry (through competency standards boards) for the development, endorsement and maintenance of national industry competency standards.

In 1992 the government established the Australian National Training Authority (ANTA) which assumed the functions of the National Training Board, and was entrusted with steering the development and monitoring of the national VET system.<sup>13</sup> It aimed to 'ensure that the skills of the Australian labour force [were] sufficient to support internationally competitive commerce and industry and to provide individuals with opportunities to maximise their potential' (ANTA 2004). This remains the stated mission. The influence of industry is especially obvious in the composition of the ANTA Board. The chairman is from the chemical manufacturing industry while other board members are from the engineering, clothing, retail and property management industries, and the Australian Manufacturing Workers' Union. Recently the board has also expanded to take into account education and Indigenous representation. As of July 1, 2005 ANTA will be abolished and its responsibilities taken back into the Department of Employment, Science and Training.

## Industry training advisory bodies

Responsibility for developing and maintaining industry competency standards for occupations and classifications was initially assigned to competency standards bodies. These bodies were formed by industry training advisory bodies or industry skills councils and committees that had been operating in the past. They consisted of representatives of employers and unions in a specific industry and government. Standards were then submitted to the National Training Board for endorsement. Once endorsed, these standards provided guidelines for training.

With the formation of ANTA, the role of these bodies was to be expanded and allocated to national industry training advisory boards. The role of the national industry training advisory boards was to provide ANTA with industry-specific information on the skill needs of the sector and to develop industry training plans based on these needs. They continued to be entrusted with developing and maintaining industry competency standards used to provide direction for training.

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<sup>12</sup> The new system was to be based on eight major principles: competency-based training and assessment; flexible and multiple linked pathways which allowed for credit transfer, articulation and recognition of prior learning; increased vocational training opportunities for those who were not university-bound, and adults to enter apprenticeships and traineeships; fair access to training for all groups and especially identified special groups (women, aboriginal and Torres Strait Islanders, people from non-English speaking backgrounds, people with a disability, sole parents, early school leavers, homeless and unemployed persons, and persons from rural and remote locations); integrated delivery networks to enable government, community and private educational providers to build partnerships and to collaborate in the sharing of expertise and facilities for training delivery; responsiveness to industry and clients; a mixture of incentives for industry, education and training providers, students and trainees..

<sup>13</sup> The role of ANTA was to provide advice to a national committee of state and territory government ministers responsible for vocational education and training (ANTA-MINCO). It was to advise this committee on national VET policy, strategy, priorities, goals and objectives, and annual plans prepared by states and territories to meet these national priorities, goals and objectives. ANTA also administered the Australian Government funding of the system.

These bodies were also to be charged with developing, reviewing and maintaining industry training packages. Employers and unions combined to provide an industry voice, and to promote industry investment and engagement with training. State-based industry training advisory bodies were provided with extra funding to provide data on regional skill and training needs to inform national industry training advisory boards. These state-based bodies were also given responsibility for promoting the uptake of industry training packages, and increasing engagement with training of small and medium-sized enterprises. In some states they also took on responsibility for the training services and production of learning or curriculum materials.

In 2003 the ANTA Board decided to progressively abolish funding for state and national industry training advisory boards as the main vehicles for providing government with industry advice and information. It decided instead to acquire this type of information from what has been called a high-level national industry skills forum, comprising ANTA and key industry stakeholders, and a system of ten new industry skills councils, each covering a number of related industries. Although funding was cut from state-based industry training advisory bodies, many of these are continuing to operate either on their own or in partnership with others, using funding from state-based sources.

The roles of the new industry skills councils are to provide accurate industry information on current and future skill needs and requirements for training, and to support the development, implementation and continuous improvement of quality nationally recognised training products and services, including training packages.

In addition, ANTA was of the view that the amalgamation of industry advisory arrangements into ten 'super' industry skills councils would prevent the continued development of 'industry silos' and promote a broader and cross-sectoral approach to VET which was more reflective of current circumstances. A more focused and strategic role, with higher emphasis on the needs of emerging industries was also envisaged for these councils. It was felt that the new skills councils would be better able to link with national approaches to skill shortages, and improve their flexibility to engage with industry and small enterprises. To ensure accountability, ANTA has also set performance targets for a three-year period.

By July 2005 ten industry skills councils had been endorsed. These were the:

- ✧ Service Industries Skills Australia
- ✧ Transport and Distribution Training Australia
- ✧ Resources and Infrastructure Industry Skills Council
- ✧ ElectroComms and Energy Utilities Industry Skills Council
- ✧ Community Services and Health Industry Skills Council
- ✧ Agri-Food Industry Skills Council
- ✧ Innovation and Business Industry Skills Council
- ✧ Manufacturing
- ✧ Construction and Property Services
- ✧ Government and Community Safety.

There continue to be a small number of industry training advisory boards, which have, as yet, to agree to amalgamation.<sup>14</sup> A description of the industry areas covered by each of these industry skills councils appears in table 2.

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<sup>14</sup> Industry training advisory boards representing the automotive, and forestry and forest products industries have as yet to agree to amalgamation with certain industry skills councils.



**Table 2: Industry skills councils according to industry sector coverage**

<b>Endorsed industry skills councils</b>	
Service Industry Skills Australia	wholesale and retail trade, tourism, hospitality, sport and recreation, hairdressing, funeral services and beauty therapy industries
Transport and Distribution Training Australia	transport and logistics, road transport, warehousing, rail operations and rail infrastructure, stevedoring, logistics management, maritime and aviation industries
Resource and Infrastructure Industry Skills Council	extractive and renewable resources exploration, extraction, harvesting, primary processing, civil construction
Electrocommunications and Energy Utilities Skills Council	electronics, electrical, communications including telecommunications—voice, data, video computer systems, instrumentation, lifts, refrigeration and air conditioning, and renewable and sustainable energy
Community Services and Health Industry Skills Council	child care, aged care, nursing
Agri-food Industry Skills Council	food production and processing
Innovation and Business Industry Skills Council	business services, cultural industries, education, financial services, information and communication technologies, printing
Manufacturing	light manufacturing, manufacturing and process manufacturing
Construction and Property Services	general construction, offsite construction and plumbing, property services
Government and Community Safety	national, state and local government business sectors (correctional services, local government, public sector, water industry)

## Industry training packages

The adoption of a system of training based on industry competency standards has constituted the major training reform of the new VET system. It is here that industry has been asked to provide major formal input to guidelines for accredited training and assessment leading to formal qualifications. Competency standards, guidelines for assessment, and qualifications for specific industry sectors are incorporated into industry training packages.

Industry training packages must be endorsed by ANTA before they can be used to deliver accredited training, assessment and qualifications. They may also contain non-endorsed components—mainly learning strategies, assessment resources and professional development materials. These activities ensure continued industry input into the development of VET courses and programs. In addition, enterprises that have specific requirements may also develop an enterprise-specific training package. Employers may select from these components a mix and match of units to package a program to suit their particular enterprises.

## Expanded apprenticeships and traineeships

Since the mid-1980s and the 1990s, the apprenticeship and traineeship systems have been expanded. Where apprenticeships and traineeships had always been undertaken on a full-time or part-time basis (in some trades) by school leavers, since 1993 they have been made available to adults. In addition, they have been expanded to cover a broader range of occupations, and have been made available to secondary school students.

It is now possible for students to start an apprenticeship or traineeship before they leave school and to complete their senior secondary certificate of education at the same time. These school-based part-time New Apprenticeships and traineeships also comprise work and training arrangements. Here students are engaged in paid work (generally averaging about ten hours a week) with an employer while simultaneously completing a nationally recognised VET qualification and their senior secondary school certificate while they are still at school. While acquiring qualifications is the main aim, students are able to use their work-based training to confirm, while still at secondary school, their career choice and its suitability or otherwise for them.

Off-the-job training has traditionally been conducted away from the workplace by external training organisations (for example, TAFE), or at an accredited workplace apprenticeship training centre operated by specific enterprises or government agencies. In 1998 the national government introduced the New Apprenticeships scheme, which incorporated both the traditional apprenticeships of four years duration, and the traineeships of shorter duration. As already noted, this development enabled the off-the-job component to be also delivered at the workplace.

## School-based linkages

Reforms to the VET system also increased the provision of accredited vocational training programs in secondary schools, including the provision of school-based part-time apprenticeships. Such programs required schools to locate, develop and maintain close linkages with local industries and enterprises to enable the provision of formal vocational placements and contracts of training and paid employment for school-based apprentices or trainees. In addition, schools required good networks with industry to ensure general work experience programs for students who were not undertaking a VET program.

## Other local linkages

There is also industry input into other accredited qualifications and courses. At the local level training providers have also established course advisory arrangements where local industries provide information and feedback on courses and provision. In addition, there is also VET representation on regional economic development boards established by various state and territory jurisdictions. Local linkages are also experienced when in the form of specific industry sponsorships for courses or the sharing of facilities for training.

Local VET–industry linkages are especially important for maintaining the skills and knowledge of the VET workforce. Return-to-industry programs, where permanent VET staff spend time in industry to update skills and knowledge, and staff exchange programs where industry personnel come to spend time in training institutions, are ways to ensure that training remains relevant and up-to-date. In addition, the use of industry personnel in the training and assessment of apprentices and trainees, and other VET students also provides an industry focus to VET training. The use of nationally accredited workplace assessors to conduct assessments of existing workers provides another example of how VET and industry connect to deliver qualifications.

There is also increased casualisation of the VET workforce across the VET sector. This enables VET providers to bring in at short notice the industry experience and expertise required to teach courses in areas of increased demand. When such lecturers work closely with permanent teaching staff, it exposes permanent teachers to new skills and knowledge.

## Current connections

Today formal connections between VET and industry continue to be used to:

- ✧ provide state and national governments with up-to-date and relevant information on industry skill needs, and strategies to meet these needs. These arrangements include national industry skills councils, state-based training advisory bodies, and national skills forums
- ✧ describe industry competency standards, qualifications and assessment guidelines to inform curriculum and assessment processes, that is, industry training packages
- ✧ provide employment and initial training for individuals in the form of post-school and school-based apprenticeships and traineeships, and group training companies

- ✧ enable the VET workforce to update skills and knowledge. These are linkages between VET providers and local industries and employers. Such local linkages are also used to provide experience for secondary school students.

## Effectiveness of VET–industry collaboration

Evaluating the effectiveness of VET–industry collaboration in Australia is not straightforward. There is not a direct causal relationship between increased collaboration and better employment and training outcomes. However, it makes sense to examine the uptake of the extent to which industry and individuals have embraced apprenticeship and traineeship models of training as an indication of effectiveness. We also examine employment outcomes and satisfaction with training of apprentices and trainees who have completed their programs. Meaningful information can also be gained from findings of reviews of existing industry–VET advisory arrangements.

It must be kept in mind, however, that the number of apprentices in traditional apprenticeships (including plumbing, engineering, carpentry and joinery, chefs, and hairdressing), and other apprenticeships or traineeships depends in a major part on the state of the economy. Employers are more prepared to take on a traditional apprentice when an economy is buoyant and they believe they can make the four-year commitment, than at times when the economy is slow. Although the time commitment to a traineeship is lower, the state of the economy also affects whether or not employers (including group training companies) are likely to put on a trainee. The buoyancy of the Australian economy in recent years has also resulted in an increase in the willingness of employers to take on apprentices and trainees.

### Apprenticeships and traineeships

The extent to which industry and individuals have embraced these concepts of training can be explained in part by information on the numbers of apprentices and trainees commencing a contract of training.

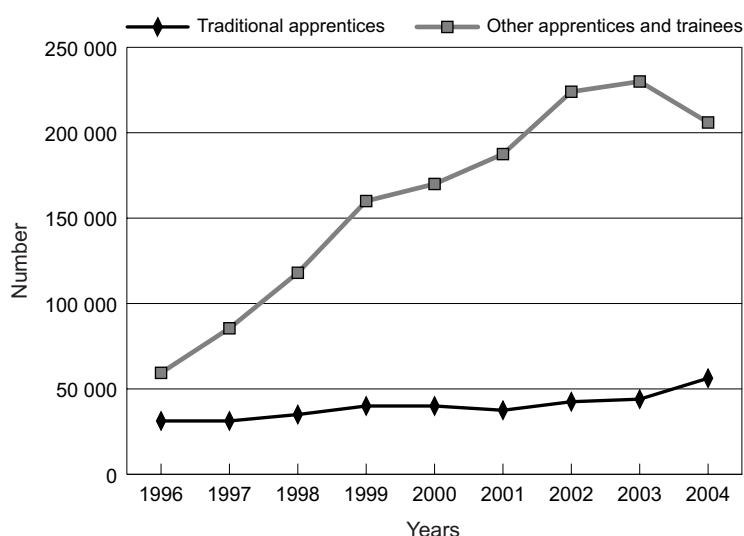
In the year ending December 2004 there were 263 058 apprentices and trainees who commenced a contract of training. This included 57 474 ‘traditional apprentices’ and 205 584 ‘other apprentices or trainees’. This represented a 23% increase for ‘traditional apprentices’ and a 11% decline for ‘other apprenticeships or traineeships’ on 2003 figures. However, since 1996, ‘other apprenticeships’ have grown steadily each year until that time. Between 2001 and 2002 they experienced a 19.6% rise. Figure 1 indicates commencements between 1996 and 2004.

### *Employment outcomes*

Citing information from the post-program data monitoring system of the former Department of Education, Training and Youth Affairs and the Department of Employment, Workplace Relations and Small Business (now the Department of Employment of Workplace Relations), Robinson (2001) concluded that employment outcomes for apprentices and trainees were good. In the 12 months ending June 1997, 80% of apprentices and 85.3% of trainees who had completed their contracts were retained by their employers or had gone to another employer in unsubsidised employment. In 2000 this figure had increased to just over 90.5% for apprentices and 93% for trainees. Although not as good as for those who complete their apprenticeship or traineeship programs, participation in these programs also had employment benefits. By the end of June 1997, there were 39.8% of the apprentices and trainees who were in unsubsidised employment three months after leaving their programs. By 2000, this had climbed to 70.1%. According to Robinson, this improvement was also reflective of stronger economic conditions. Citing data from Grey et al. (1999) Robinson noted that employment outcomes were greater the longer people stayed in a traineeship, even when it was not completed. Although these trainee arrangements often resulted in permanent employment either with current employers or with new employers, Cully and Curtain (2001, 2002) also highlighted some strategies that could be used to further improve training arrangements for trainees.

Notwithstanding such positive employment outcomes from apprenticeships and traineeships, there continue to be skill shortages in the trades and in occupations typically associated with VET training. The identification of such skill shortages is based on surveys of employers who have advertised vacancies for selected occupations, information from industry, employee organisations and training providers. In December 2003 a survey of shortages in the trades conducted by the Department of Employment and Workplace Relations highlighted shortages and/or recruitment difficulties for tradespersons in the metal engineering, vehicle, electrical and electronics, construction, food, printing, wood, hairdressing and furniture trades. In March 2004 there continued to be skill shortages of childcare coordinators and childcare workers and enrolled nurses, occupations generally associated with VET training (Department of Employment and Workplace Relations 2003, 2004).

**Figure 1: Apprentice and trainee commencements 1996–2004**



Source: NCVER Apprentice and Trainee Collection, March 2005; based on December 2004 estimates

### *Satisfaction with training: Apprentices and trainees*

The National Centre for Vocational Education research (NCVER) Student Outcomes Survey collects information from apprentices and trainees who have completed their off-the-job components of their training in a TAFE institution. This may include some apprentices and trainees who have also completed both off- and on-the-job components. In 2003 there were almost 90% of such apprentices and 83% of trainees who reported that they had received some job-related benefit from their programs. Just over half (52%) of apprentices and 45% of trainees had also received an increase in earnings on completion of the course. When the employment experience of these apprentices and trainees is examined, we find that they experienced increased employment levels on completion of the training. For example, where 78% of the total group of apprentices and trainee respondents were employed prior to their TAFE course, this had increased to by 11 percentage points to 89% on completion of their course.

In terms of satisfaction with the overall quality of their course, there were 83% of apprentices and 82% of trainees who replied that they were satisfied with course quality (NCVER 2003).

Citing information from Skills Initiative working groups for the engineering trades, the Employment and Workplace Relations and Education References Committee of the Australian Senate (Commonwealth of Australia 2003) reports that there continue to be skills shortages in many of the traditional trades. It is also felt that there had been a decline in the quality and size of the applicant pool for apprenticeships at a time when skill requirements for the trades had increased substantially. This is felt to be due to a poor public image of the trades among students, their

parents and the community at large. Increased school retention rates also means that school leavers are of a higher age when entering the labour market and are not choosing apprenticeships which were associated with low initial wages.

### *Satisfaction with training: Employers*

There has also been an increase over time of the number of employers prepared to take on a recent VET graduate, including apprentices and trainees. Surveys of employer views on vocational education and training indicate that the number of such employers was estimated to be 63 000 in 1995, 104 000 in 1997, 117 000 in 1999, and 126 500 in 2001 (NCVER 2001a). Such surveys have found that responding employers have been generally satisfied with the VET system. In 1999 and 2001, 69% of employers of a recent VET graduate held the view that the system was providing skills that were appropriate to their needs. In contrast, just over 40% of employers who had no recent VET graduate felt this to be the case. Almost three-quarters of such employers in 1999 and 2001 reported that they believed training paid for itself in terms of increased productivity. This compared with 68% and 76% respectively for those without a recent VET graduate employee. In 1999 and 2001, about 85% of employers with and without a VET graduate were of the opinion that there should be more work experience or work placements as part of vocational training. About 80% of employers also believed that employers should have more input into course content.

Employers have also been generally satisfied with the delivery of training providers. In 1999 the most satisfied of the industries were communication services, followed by agriculture, and government administration and defence. Over 90% of these industries posted a rating of satisfied or very satisfied. The least satisfied were electricity, gas and water, education, wholesale trade and manufacturing. In 2001 the most satisfied were industries in the electricity, gas and water (which had improved by 41% points) and communication services sectors, followed by wholesale trade and construction.

### National and state training advisory bodies

The 2002–03 Commonwealth budget indicated that the financial support that state-based advisory training bodies received from the Commonwealth Government would be cut off. In 2003 ANTA also made a decision not continue with its network of 29 national industry training advisory boards opting for a streamlined industry advisory network of ten industry councils. The report of the Employment and Workplace Relations and Education References Committee of the Australian senate (Parliament of Australia 2003) documents concerns that have led to the gradual demise of the state and national industry training advisory board networks. These include concerns about the cost of the system, apparent size of the bureaucracies associated with such arrangements, and the variable performance of different organisations. There have also been concerns that these bodies had not sufficiently promoted training among small and medium-size enterprises.

The forced amalgamation of the national industry training advisory boards into the ten industry skills councils has drawn criticism from unions, employer groups and state governments (Commonwealth of Australia 2003, 2004). Unions are concerned about the silencing of a combined industry voice. Employers object to being forced by government to rearrange industry advisory arrangements. The Government of Victoria is concerned that the reduction of government funding for state bodies would have a major impact on the nature of industry collaborative arrangements to support government economic planning and planning for VET. The Government of Tasmania is still unclear about how the new arrangements will help to address questions of labour market skill issues. The Government of Western Australia is concerned about the loss of a combined union–employer voice at state level.

It is still too early to evaluate the impact of the industry advisory arrangements based on the industry skills council model. However, already there are criticisms from industry advisory boards and employer stakeholders that a strict emphasis on the notion of ten councils may be misplaced and that the number of councils should be dependent on a sensible and meaningful approach to

amalgamation. There are also problems envisaged about the adequacy of such amalgamations for certain industries.

## Training packages

As at July 2004, there were 72 industry and nine enterprise training packages endorsed by ANTA (NCVER 2004c). In 2003 ANTA commissioned a review of the training package model. The 'High Level Review' (as it has come to be known) reaffirmed the value of the training package model (albeit with some improvements) for aiding the delivery of 'good labour market and educational outcomes for enterprises, industries, individuals and communities'. More specifically, it highlighted the 'labour market and educational value' of industry descriptions of the standards of skills and knowledge expected in the workplace, and of industry-developed qualifications linked to a national framework (the Australian Qualifications Framework). The review also highlighted the effectiveness of bringing these together in one package (ANTA 2004).

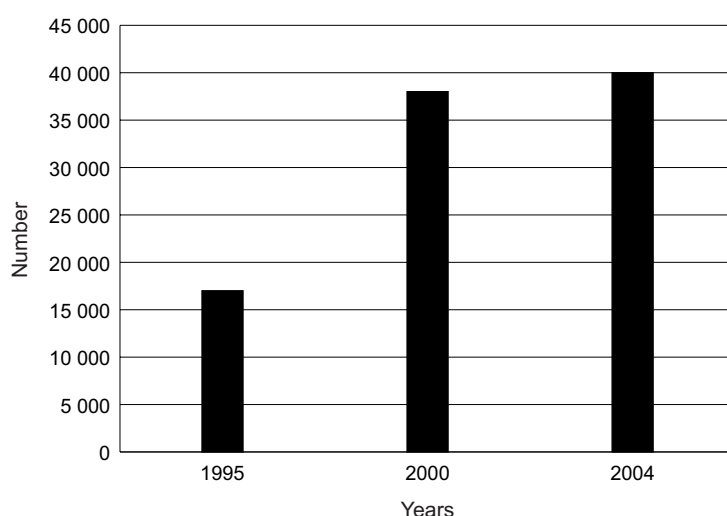
Although the review concluded there was no need for a major upheaval of the approach, it noted that there was a need to ensure confidence and trust in the training package by reaffirming what training packages, 'can, and cannot deliver and by clarifying roles and responsibilities' (p.14). In particular, there was a need to streamline the process of endorsement, so that unnecessary delays sometimes caused by national–state disagreements could be avoided.

A number of concerns relating to training packages for specific industries have also been identified by Misko et al. (2001). These concerned the ability of school leavers in institutional pathways to follow a program more customised to the needs of existing workers than to those who had no previous experience of work. Such concerns were especially highlighted for information technology, travel and tourism and electrical/electronics courses. In addition, there were concerns about duplication or overlap between qualifications in the same training package. The High Level Review has also identified the need to recognise that the requirements of new entrants to an occupation are different from those of mature and existing workers, and that unnecessary duplication needed to be avoided.

## Group training arrangements

The effectiveness of these arrangements can be judged by growth. The number of apprentices and trainees employed in group training companies has more than doubled in the last decade. Today there are almost 40 000 apprentices and trainees employed by group training companies. This represents just over 9% of the total share of apprentices and trainees (see figure 2).

**Figure 2: Number of apprentices and trainees with group training companies 1995–2004**



Source: NCVER apprentice and trainee collections, 38, 39; unpublished data

## School-based part-time New Apprenticeships

The numbers in school-based New Apprenticeships have grown rapidly, from just over 100 in the mid-1990s to almost 11 000 in 2003. In the 12 months ending 31 March 2003, NCVET (2003) reports that there were 10 900 apprentice and trainee commencements which were school-based contracts. This represented 4% of total apprenticeship and traineeship commencements for that year (NCVER 2003).

A review of school-based apprenticeships conducted for ANTA found that, in the main, the program had provided benefits for young people and had the potential to provide alternative pathways to transition (ANTA 2002). A study by Smith and Wilson (2003) indicates that the majority of those undertaking these apprenticeships and traineeships enjoyed their work, and that many believed that they had developed a diverse set of industry-specific skills and knowledge, and appropriate work habits, maturity, and confidence. Students in a broad range of industries believed that their workplace learning had helped them with their learning in other subjects.

Keeping in mind that some of the students in these programs were also expected to work or undertake training during school vacations, the researchers expressed concerns about the effectiveness of such arrangements. There were also concerns about having a concentration of these arrangements in retail and hospital sectors that generally employed a lot of part-time student and non-student workers. Also at issue was the flexibility of timetabling arrangements.

Jung et al. (2004) also found that there were a number of trade sectors (some sectors of the building and engineering trades) which did not support current school-based, part-time arrangements. This is because they believed it would be difficult to arrange release times for students when they were most needed on the job. In addition, such part-time engagement also made it difficult to ensure that apprentices and trainees were able to complete projects assigned to them, and develop new skills.

## Other workplace learning connections

In addition to the part-time school-based apprenticeship and traineeship programs that are fundamentally based on school–industry collaboration, secondary school providers will also link with industry in the provision of other workplace training for their students. This may take the form of work experience and the more structured workplace learning programs supported by the former Australian Traineeship Foundation, later to become the Enterprise and Career Education Foundation. The growth of these programs has been reported in a number of studies and government reports (Misko 1997, 1998; Misko et al. 2001; Jung et al. 2004; Ministerial Council on Employment, Education, Training and Youth Affairs 2003; Misko & Slack 2001; Enterprise and Career Education Foundation 2002; Robinson & Misko 2003).

To provide extra opportunities for students to undertake a variety of industry programs, schools have clustered together to pool and share resources (Misko et al. 2001). Clusters have used these resources to pay the salaries of work placement coordinators with responsibility for establishing industry linkages and locating placements. Where possible, these coordinators have also established strong linkages with specific industries to provide regular placements for their cluster. In other instances, coordinators have the ongoing task of locating ongoing placements, explaining to employers the training required, and establishing guidelines for assessment and reporting. These tasks are labour-intensive, and at times there is a concern that much of the work by coordinators and teachers of vocational programs in schools is not being acknowledged by adequate funding.

In 1994 there were fewer than a 1000 students undertaking structured workplace learning programs supported by the Australian Student Traineeship Foundation. By 2000 this had grown to more than 70 000 students; by 2002 there were 112 403 students who had undertaken a structured work placement. This represented just 61% of students in a VET in Schools program, compared with 44% in 2000 and 55% in 2001 (Ministerial Council on Employment, Education, Training and Youth Affairs 2003).

Engagement in these structured workplace learning programs while still at school has helped students to obtain a job on leaving school. In 2001 the Enterprise and Career Education Foundation conducted a second survey of the destinations of students who had participated in foundation-supported local partnerships in 2000 and had left school that year. The findings showed that most respondents (70%) were either in full-time or part-time work, and that 65% of respondents reported that their work placement had helped them to gain a job (Misko & Slack 2001).



When we talk about the linkages between industry and VE in China we are also referring to activities which are mutually beneficial to all parties involved in the relationship. For example, enterprises provide VE institutions with supervision and support and financial assistance in course establishment and curriculum development, while VE institutions provide enterprises with skilled labour and educational services to help them develop their businesses. By concentrating on the development of the all-round qualities of students, higher VE helps to train senior technicians and specialists for business and industry. However, industry also has a major role to play in the development of this expertise. Industry provides field practice training places for higher VE students and resources for senior-level technicians and specialists to attend VE institutions to improve the specialist skills required for specific enterprise tasks. The goals of this two-way participation are to improve workforce quality and ability to meet the demands of the developing market economy.

## Historical developments of policies on VE–industry linkages

The Chinese Government attaches great importance to the development of linkages between industry and VE. This is reflected in a series of policies and regulations.

### (1) 1949–78: Exploration and development phase

During this period industry–VE linkages can be divided into two stages. The first stage applies to the period 1949–66; the next stage refers to the period between 1966 and 1978. In 1949 the People's Republic of China was proclaimed and the first steps were taken to nationalise the economy. Old vocational schools were restructured and strengthened. Nine years later Comrade Mao Zedong determined that education must be combined with productive labour. This was to become one of the most important principles of Chinese education. In the same year, the Central Committee of the Chinese Communist Party and the State Council issued a decree, 'Regulations on decentralising administration power in education', which removed VE from the sole responsibility of the government and opened the way for industry to be involved in the delivery of education and training. The policy clearly confirmed the decentralisation of administrative power, and the implementation of a two-track education system, based on a 'multi-channel' and 'multi-style' approach. In September of the same year, the Central Committee of the Chinese Communist Party and the State Council issued another decree ('Instructions on educational work'), which recommended the 'co-existence of government-run schools and schools run by factories, mines, enterprises, and agricultural cooperatives'. In order to develop additional technical staff and skilled workers, some industries established secondary specialised schools and skilled worker schools. This provided these educational institutions with experience in technical training, which also enabled them to develop effective guidelines for action and to accumulate much-needed school resources. This then established a group of schools with strong foundations for the delivery of vocational training.

The second stage applies to the period of the Great Cultural Revolution which extended from 1966–76. During this period the linkages between industry and VE were largely eliminated. Nevertheless, at the National Education Work Conference in 1971, representatives from some ministries, provinces and cities made strong requests for the restoration and development of secondary specialised schools and skilled worker schools. On 6 July of the same year, Premier Zhou

Enlai confirmed the need to establish secondary specialised schools and announced that such schools could be run by factories and mines, either independently, or in collaboration with other factories and mines. He also announced that such secondary specialised schools could also be established by local governments.

## (2) 1978–66: Restoration phase

The years 1978–85 represent a critical stage for the restoration of linkages between industry and VE. At the end of the ‘Great Cultural Revolution’, and after the Third Plenary Session of the Eleventh Central Committee of the Chinese Communist Party, China’s policy focus shifted to economic development. The education sector also went through a series of readjustments. VE was restored, secondary education was restructured, secondary specialised education was strengthened, vocational senior high schools were expanded, and pilot studies of higher VE were initiated. During this period the linkages between industry and VE were also re-established and intensified.

At the National Education Conference of 1978, Deng Xiaoping proclaimed the principle of combining education with industrial production and labour. He confirmed the need for education to support and satisfy the demands of national economy development. On 7 October 1980, the State Council released its *Report on reforming the structure of secondary education* (Guo fa 1980) which was prepared by the Ministry of Education and National Bureau of Labour. The document re-emphasised the principle of ‘three form co-existence’. This referred to the co-existence of:

- ✧ basic education and VE
- ✧ full-time schools, part-time work and part-time study schools, spare-time schools
- ✧ state schools and schools run by local enterprises.

A number of specific recommendations for the incorporation of VE studies into the curriculum and for the establishment of specific types of vocational schools were also made. General senior high schools were to offer VE subjects, and selected senior high schools were to become senior vocational high schools. Recommendations were also made for the establishment or redevelopment of vocational junior high schools, agricultural schools, senior vocational high schools and skilled worker schools. There were also recommendations for the development of experimental vocational and technical education centres in large and medium cities. The release of this historic policy document heralded the first of a series of VE reforms in China. It represented the government’s first comprehensive and systematic policy of reforming and developing secondary education since the adoption of economic reforms and the open-door policy. It was also the first time that the government had clarified its position on the linkages between industry and VE.

Between 1985–96 Chinese VE experienced a period of rapid progress, and its linkages with industry increased. The fundamental policy underpinning this period of reform and development was spelled out in the policy document entitled ‘Decisions on reforming the educational structure by the Central Committee of the CCP’. From 2 to 6 July 1986, the National Education Commission, National Planning Committee, National Economy Committee and Ministry of Labour and Human Resources held a joint national conference on ‘VE work’. The major aim of the conference was to faithfully implement the ‘Decision’.<sup>15</sup> In 1987, the National Education Commission held a forum in Bei Dai He on reforms to secondary specialised education, in which the principle of ‘three combinations of teaching, field practice, and technical service’ was confirmed. This conference played an important role in promoting the need for the teaching of practical skills and integration of industrial production and education. Since then, all types of VE schools have developed field practice bases and established school-run enterprises. This has also improved the quality of teaching and strengthened schools’ engagement in community service.

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<sup>15</sup> *Important documents on education of the PR China, 1976-1990*, Hainan Press, Haikou, 1998, pp.2494–6.

In July 1990, the Central Institute for Vocational and Technical Education was established by the Ministry of Education. This is the only VE research and development institute for the country. One of its tasks is to advise on and monitor the development of linkages between industry and VE. Since its establishment, the institute has conducted a great deal of research and development in this area. For example, the institute has conducted studies of vocational classifications, skilled jobs, and codes of conduct. It has also conducted consultancy-based research into the knowledge and skills required for China's construction industry and produced guidelines for the sector's skilled worker schools.<sup>16</sup> The institute has also collaborated with the China Electrical Engineering Enterprise Association in studying Germany's 'dual system' and its approach to and experience in skilled worker training. As a result, it has been able to use this information to customise teaching, learning and assessment practices and materials to suit the needs of China's electrical engineering industry. This has included developing appropriate training models, teaching methodologies, teaching plans, examination processes and textbooks. It has also included methods for teacher training, and for involving industry in education and training. In addition, the institute has also published many reports on ways to establish effective linkages between industry and VE.<sup>17</sup>

On 25 January 1991, the National Education Commission, National Planning Commission, Ministry of Labour, Ministry of Human Resources, and Ministry of Finance held a second joint national vocational education conference. One of the aims of the conference was to further promote the principle that 'the whole society has a role in VE', and that it is important to pay attention not only to the growth of the sector, but also to the quality of teaching and learning. The conference emphasised the need to explore new models for further developing VE and the importance of customising approaches to suit the Chinese situation. For example, the conference decided that it was necessary to:

- ✧ involve individuals from all 'social forces' in the running of VE, thereby gradually establishing a multi-pathway, multi-level, and multi-mode education system
- ✧ adopt the principles of needs-based teaching and flexible and varied forms of education, thereby gradually improving educational standards
- ✧ increase the provision of VE by adopting the multi-pathway method
- ✧ design policies and regulations to establish effective mechanisms for the promotion and further progress of VE
- ✧ extend educational reform, emphasising the further development of the VE system.<sup>18</sup>

The conference also discussed the draft policy document, 'Decision of the State Council on the intensive development of VE', and made recommendations. After revising the draft policy document, the State Council released the 'Decision' in October 1991. The policy stated that: 'All categories of VE schools and training centres should endeavour to develop school-run enterprises and to incorporate field practice in study requirements and conditions. [We] must promote collaboration between industrial production and education, and between work and study'. In 1993, the 'Guidelines for China's educational reform and development' proclaimed that with government guidance, VE must collaborate with industry to run vocational schools. It was to implement the principle of combining industrial production and education, and to make further use of school-based enterprises to strengthen the school's ability for self-improvement. These policies led to the further development of VE, and promoted, strengthened and expanded linkages between industry and education.

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<sup>16</sup> 'Study field catalogue for building and installation skilled worker schools of the Ministry of Construction of the PRC.'

<sup>17</sup> These include, for example, 'Implement collaboration of administration, research and enterprises, explore the path of reform in skilled worker education', 'Review of the development projects in small business training programs', 'Review Report on the pilot project of teaching reform by the Central Institute for Technical and Vocational Education and the Beijing Railway Bureau'.

<sup>18</sup> 'Important documents on education of the People's Republic of China' 1991–97, Hannan Press, Haikou, 1998, pp.3101–3.

The Department of VE of the National Education Commission combined with relevant industry sectors to establish five national specialised teaching research groups. These included: architecture/building; commerce; garment; tourism; and electronics. These groups produced teaching plans for 13 specialisations in eight categories such as agriculture (plants and aquaculture), commerce (commodity marketing), and so on. It also organised editing and publishing of over 400 different types of textbooks. These textbooks are used by about 60% of the students in vocational senior high schools.

In order to further promote rural vocational education in the agricultural industry and raise the skills and qualities of farmers and rural workers, the National Education Commission, National Science Committee, Ministry of Agriculture, Ministry of Forestry and the China Agriculture Bank held a joint forum in Anhui entitled 'The cooperation of agriculture, science and education: evaluating and exchanging experience'. In conjunction with projects aimed at increasing compulsory school participation in rural areas (for example, the harvest, sparks and prairies fire projects), 11 regions and cities raised a total of 1.2 million yuan to help promote vocational education in the rural areas. This provided training for three million farmers, and introduced the sector to 517 different practical techniques. Sixty-four of the pilot projects made a total of 1.2 million yuan of profit for local communities and produced 36 million yuan that could be channelled into social economic improvement.

In addition, many communities established comprehensive vocational training centres in their counties, thereby adopting the principle of 'overall planning by government, joint operation by departments, coordination by education committees, and implementation of the multi-systems approach to education'. These training centres included agricultural high schools, vocational high schools, adult secondary specialised schools, and other various vocational training institutions. They offered specialised training to suit student needs, and expanded training in scientific technologies, information services, and business. The main focus for these training centres was the development of junior and intermediate-level skilled workers for the agricultural industry sector. Today these centres continue to act as a hub for the collaboration of agriculture, science and education. They have made a great contribution to the rural economy and community development.

China has also begun to strengthen the development of vocational education in urban areas by establishing a qualifications system to meet the needs of economic reconstruction. On 23 June 1986, the Commissions for National Education, Planning, and Economy issued a joint document entitled 'Suggestions for strengthening cooperation between economic departments and education departments, and accelerating the development of pre-employment vocational education'. Recommendations were made for the inclusion of training plans for existing workers in all new large and medium projects (including international operations). This was to ensure the parallel progress of economic development and human resources training. In addition, relevant enterprises were also asked to make an active attempt to provide opportunities for student field practice placements, to recruit VE graduates, and to establish required cooperative networks with schools. Although these recommendations were well intentioned, unfortunately they were not effectively implemented.

The reform of the Chinese economic system has led to the introduction of the market economy and its associated expansion of enterprise ownership. In such an environment the traditional urban VE system has found it difficult to adapt to the needs of marketisation and modernisation. As a result, China has had to abolish traditional administrative boundaries by shifting responsibility from central administrative departments to other social agencies. It has also had to focus VE provision on the skills required by the wider labour market by expanding the scale of educational offerings. As a result, various models of school governance have been adopted. For example, the Jiaying Civil Engineering School is now governed by a board of trustees. Such developments confirm the adoption of the multi-forms approach to the operation and administration of VE in China.

### (3) 1996–2004: Intensive reform phase

The years 1996–2004 represented a period of more intensive reform in VE and the establishment of increased linkages with industry. The driving force for reform was the passing of the *Vocational*

*Education Law* in 1996. The law stated that ‘vocational schools and vocational training institutions should develop linkages between industrial production and education, and serve the needs of local economic development’. They should also maintain close ties with enterprises, to enable trainees to acquire practical skills and become skilled workers. This law established clear regulations on the responsibilities and rights of all vocational schools, including those run by national, provincial and local governments, industry sectors, enterprises, public institutions and communities. The law also established legal principles for the operation and development of school relationships with industries and enterprises.

However, other reforms of government institutions were to weaken the impact of these regulations. In March 1998, the First Session of the 9th National Congress adopted a plan to reform State Council ministries that had been responsible for industry. This institutional reform weakened their responsibilities for overall administration, coordination and supervision. The National Commission for Economy and Trade which comprises textile, mechanical, coal, light manufacturing, oil, chemical, building materials, metallurgical, non-ferrous metals, and domestic trade industries abolished its responsibility for education. Responsibility for junior industrial schools was transferred to local departments for industries and trade. Other ministries also reduced their responsibilities for VE and reduced staff numbers. In the absence of other mechanisms (for example, traditional craft guild systems) for maintaining close ties between industry and VE, these reforms made it very difficult to implement the *Vocational Education Law* which allocated the responsibility for coordinating and supervising strategies for the further development of VE to industry organisations and enterprises.

Despite these difficulties, the importance of maintaining VE–industry linkages continued to be highlighted. In 1999, the Central Committee of the Chinese Communist Party released its ‘Decision on extending educational reform and promoting large-scale implementation of qualities-based education’. The ‘Decision’ affirmed the need for integrating education and industrial production and highlighted this as an important mechanism for developing workers with all-round skills and attributes. In addition, it also re-enforced the need for vocational schools to combine work and study, and to encourage students to acquire practical skills. In the same year, the Department of VE and Adult Education of the Ministry of Education established 33 industry–VE supervision committees to further develop industry–VE linkages. In 2000, the Ministry of Education released the policy document, ‘Suggestions for the delivery of qualities-based education, and further reforms of the VE teaching sector’. The government urged vocational schools to deliver both general and work-based education, and to develop close linkages with enterprises. In addition, teachers and students were to be engaged in the development of innovative technologies and the promotion and application of these in the wider community. In 2002, the State Council adopted the ‘Decision on the active promotion of vocational educational reform and development’. This recommended the strengthening of relationships and contacts between VE schools and human resource departments in enterprises and industry organisations. It also urged schools to establish mechanisms for ensuring that their programs met the needs of the labour market. The policy also ordered VE schools to integrate their teaching with industrial production, community service, and technology promotion and development. In addition, schools were to ensure that, in developing the vocational abilities of students, they were also to foster the development of professional ethics. The document further specified the role of industry organisations and enterprises in VE. Other ministries (for example, the Ministry of Education, National Economy and Trade Commission, and Ministry of Labour and Social Welfare Security) reinforced these ideas in their publications.

In keeping with national policy and programs, relevant ministries and their departments, industry organisations and enterprises, and VE institutions began to promote, explore and implement opportunities for VE–industry collaboration. For example, since 1999, the Ministry of Communication and Transportation has promoted a model of education and training which integrates industrial production with education, and increases relationships between schools and enterprises. New teaching techniques which combine theory and practical training have also been adopted. Curriculum has been developed for four specialised fields, and teaching schedules and

program outlines for courses in navigation have been revised to meet the requirements of the new international navigation treaty.

There has also been a focus on reforming Chinese VE by investigating how other countries have gone about modifying their VE systems to meet the needs of a changing world economy. On 11 August 2000, the Central Institute for Vocational and Technical Education signed a memorandum of understanding with the National Centre for Vocational Education Research, which led to collaborative research on the structure of VE in Australia and China.

In 2002 the institute also participated in the 'China–Australia Chongqing VE Project' funded jointly by AUSAID and the Chinese Government. One of the goals for this project was to reform the VE system in China so that it was more relevant to industry, and to enable students to master required skills. To this end, representatives of state enterprises, industry organisations and associations, and entrepreneurs were involved in designing and delivering (teaching) VE programs. They were also involved in the development of curriculum and teaching outlines, and setting the standards for training, assessment and evaluation.

By the end of 2003, the ministries of Education, Labour and Social Welfare Security, Information Industry, Communication and Transport, and Public Health, along with the National Defence Committee, China Mechanical Engineering Association, China Automobile Industry Association, China Automobile Maintenance Industry Association and national industry/trade organisations implemented joint programs for the training of workers for the manufacturing and modern service industries, which were experiencing significant skill shortages. These programs were based on the integration of industrial production and education, and reflected closer relationships between schools and enterprises. They also implemented training programs based on requests from enterprises, individuals and other agencies. In January 2004, the Ministry of Labour and Social Welfare Security decided that, in addition to continuing with its full-scale implementation of its national project for training specialists for high-tech industries, it would also implement a new national project. The aim of this new project was to train 500 000 new technicians (including specialised technicians and other highly qualified specialists) for the manufacturing and service industries by 2006. Training would be delivered via a combination of on-the-job training at the workplace, school-based training, and independent learning. By adhering to the principle of 'rapid training, effective implementation, and high economic returns', the government had set in motion its strategies for constructing a national skilled workforce.

China has also examined the operation of VE–industry linkages through discussion and evaluations of practice. In October 2002, the first national forum on the experience of higher vocational and higher specialised institutions with the integration of industrial production, education and research was held in Hunan. The focus of discussion was the experience of agricultural higher vocational institutes. The forum concluded that the development of the higher VE sector was dependent on the successful integration of industrial production, education, and research.

In December 2003, the second national forum on the experience of higher vocational and higher specialised institutions on the integration of industrial production, education, and research was held in Wuhan. The focus here was the experience of VE collaboration with manufacturing industries. The forum concluded that higher VE should be concerned with the development of skills and talents required for specific occupations, the labour market, and society. Higher VE should also focus on its own continuous, healthy and rapid improvement, and serve the needs of socialist modernisation. In February 2004, the Ministry of Education held the third forum in Wuxi City, Jiangsu Province. The forum reflected on the achievements of the past five years of reform and development of Chinese higher VE, and re-affirmed the sector's need for full-scale harmonious and continuous progress.

In February 2004, the Ministry of Education held the first national experience exchange forum on the integration of industrial production and education in secondary VE. In her speech Minister Wu Diqi highlighted the importance of integrating production, learning, and scientific research and the

urgency of combining production and learning. This forum underscored the importance of collaboration between industry and VE.

August 2004 was another important milestone for the extension of linkages between industry and VE in China. The State Council issued its 'Decision for actively promoting the reform and development of VE'. Enterprises were to strengthen their engagement in various forms of collaboration, and provide field practice placements for students. They were also urged to provide part-time teachers and equipment for vocational schools, and to establish research and development institutes and experimental centres within vocational schools. In addition, large enterprises with appropriate facilities were given permission to establish their own schools or collaborate with tertiary institutions to establish a VE institute. Medium and small-sized enterprises, however, were asked to rely on linkages with VE schools and VE training institutes for training their own staff and potential workers. In addition, enterprise-run VE schools and training institutes were also to be opened up to the wider community. This decision provided a comprehensive overview for the way China was to implement VE reforms so that VE could become responsive to industry needs, and industry would shoulder some of the responsibility for vocational training. By outlining the specific guidelines for how to go about improving collaboration between VE and industry, the decision also performed a quality assurance role. The decision also heralded a new development phase in VE–industry collaboration.

## The current environment

Today, government policy continues to guide the provision of VE in China. There is a focus on being responsive to the needs of the labour market, preparing students for occupations and employment, and combining workplace practice and production with study. There is also a focus on continuous improvement. In 1994 the national education conference concluded that combining workplace practice and industrial production with study was a basic tenet of socialist education.<sup>19</sup> Subsequent directives repeatedly underscored the importance of combining practical work-based training with education, of close linkages between schools and enterprises, and of encouraging students to participate in work-based training. They also highlighted the importance of combining teaching and scientific research to further develop, promote and apply new technologies in training and in community service.<sup>20</sup> In 2002, the State Council also emphasised the close connection between vocational skills training and professional and vocational ethics.<sup>21</sup>

The combination of industrial production with study is essential if VE is to adapt to the changing structure of the Chinese economy. It must develop appropriate strategies to meet the needs of industrialisation, and accelerate and increase the development of skilled workers, to meet these demands. Its focus on reforms which will enable it to meet the needs of changing occupations and changing labour markets is of great significance. It is clear that it is this focus that will open up diverse pathways to employment, and increase student access to different jobs. In addition, a focus on training responsive to the changing structure of the economy will also enable the re-allocation and adjustment of human resources. This means that existing workers in the towns and cities and workers in the rural labour force can upgrade their skills to move into alternative jobs, thus helping to alleviate any difficult social problems.

In recent years local governments, administration departments, and VE schools have faithfully implemented the national government's requirements regarding the combination of work and study, and collaboration between industry and education. They have promoted these and other VE reforms, and have consequently accumulated considerable experience. At the same time, strategies for the further development of VE have been incorporated into local economic and community

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<sup>19</sup> Comrade Jiang Zemin's speech at the national educational conference.

<sup>20</sup> Ministry of Education, 'Suggestions on carrying out quality education and deepening VE teaching reform', 2000.

<sup>21</sup> State Council, 'Decision on vigorously promoting VE reform and development', 2002.

development plans, and in the restructuring of local industries. These strategies have laid down a solid foundation for the development of stronger linkages between industry and VE.

For example, the Tianjin Government has declared that by 2006 it will have in place a high-quality VE system, which is of reasonable size, appropriate structure, high standard, and coordinated with general education. It will also have close linkages with major and leading industries in the region, and provide training which is responsive to the needs of economic society. In recent years, Jiangsu and Zhejiang Provinces have also been promoting the collaboration of economies, science and education in their regions. They have implemented an integrated approach to basic education, vocational and technical education, and adult education, and have focused on human resources training as a way to build their advanced manufacturing industries. They have promoted the view that the primary resources for success are 'skilled talents'. They have also asked VE teachers to further liberate their minds, and to implement creative training solutions for the development of large cohorts of highly skilled managers and administrative workers, and intermediate-level and senior-level technicians and skilled workers.

National and local governments are also fully dependent on industries to assist them in analysing requirements for human resources and VE teaching. For example, in 1999, the Ministry of Education set up 33 industry-VE supervision committees. These committees played an important role in reforming curriculum and developing teaching materials according to the 'Action plan for education towards the 21st century'. Provincial governments and national ministries of industry have also made important contributions to VE reform, and have established consultancy organisations to provide VE supervision. So far China has achieved considerable success in developing closer ties between VE and industry.

## Models of collaboration

The following models of VE-industry collaboration can improve our knowledge of the unique way that China has gone about developing these linkages.

### The 'mutual cooperation between enterprise and school' model

In this model the enterprise takes the initiative to look for a suitable school partner. In doing so it searches for well-established VE schools that offer relevant specialised training. The aim is to improve enterprise industrial production processes, and provide benefits to both enterprise and school. For example, the Wuxi Sangda Guolian Energy Company, jointly funded by Shenzhen Sangda Pty Ltd and Wuxi Guolian Group Pty Ltd, specialises in the development, manufacture and marketing of mobile phone batteries. Since its establishment in 2004, it has been reasonably successful in designing and manufacturing such batteries. The company has chosen to work with Wuxi VWET Centre to further its product development. This centre was chosen because it had the required high-quality numerical control equipment, teachers with specialised expertise, and students of high ability.

For its part the school has provided the manufacturing workshop and a team of five specialist teachers and field practice trainers to work as part of a project research group. The company has also given the school 250 000 yuan, and helped to fund costs of equipment and facilities. An agreement was signed to allocate the tasks of administration and marketing to the company, and production and technology to the school.

During the cooperative production period, the VE centre teachers learned about the production of mobile phone batteries through workplace practice, and worked hard to develop high-quality designs. They gradually developed a set of processing techniques and operating standards which enabled the transition from the research and development phase to the production phase. At the same time, the company employed about a dozen workers, including a number of students who were employed part-time. As time went on, the company gradually established a sizable production



team. At present, the company has achieved its production objective of designing and producing eight sets of dies per month. Students from the VE centre have become the backbone of the staff involved in designing and manufacturing dies for the phone batteries. Now both company and school have experienced the mutual benefits that can be derived from collaboration, that is, technology advances and increased production.

### The ‘training by order’ model

In this model of collaboration, the school chooses its enterprise partner, and signs an agreement to provide human resources training. The enterprise is involved in school management, and provides assistance with funding, equipment and workplace practice. It also provides a number of specialist teachers. The school establishes specialised courses and training programs, develops curriculum to meet the enterprise training objectives, and organises the teaching required. The school also participates in the development of new technology and products, and provides in-service training and consultancy services.

Zhenjiang City Vocational Education Central School in Jiangsu Province has been very successful in adopting this model of collaboration. The school has taken the initiative to select its enterprise partner and has focused its activities on the provision of customised human resources training. The school has been able to provide a service which was especially needed in the labour market, and selected an enterprise that had sound administration systems in place and needed to train large numbers of technicians.

To establish the initial collaboration, the school and the enterprise were engaged in joint dialogue. Together they developed the training plans which identified the level of knowledge and specialised skills required, the relevant professional ethics that were to be observed, and the specific responsibilities of the school and the enterprise. The school then invited the enterprise to participate in school administration, to monitor teaching quality, and oversee the achievement of training goals. In addition, the duties, rights and interests of both parties were clarified. Enterprises selected student trainees on the basis of school recommendations, and on their academic results, ideological and moral standards, psychological makeup, and intellectual abilities. At the same time, they also established some incentives to encourage student participation in the program. These included scholarships for talented students and partial tuition fee subsidy for other students who obtained high academic results and demonstrated competent performance. These incentives also included paid field placement work, and decreased or waived post-graduation probationary periods.

This close school–enterprise connection also proved beneficial for students and for the school. It provided students with community and industry networks which they could access on graduation, and facilitated a system whereby the school could provide better service to industry and to the community.

### The ‘zero period of adaptation’ model

In this model of collaboration the VE school identifies the knowledge and skill requirements of the enterprise, and then makes full use of enterprise resources to provide an appropriate training program to produce graduates for industry who can move directly into positions without any other specific orientation requirements. This includes restructuring courses and curriculum, training new types of specialist teachers, and establishing field practice placements within and outside the school.

Heilongjiang Agricultural Economic Vocational College is a successful example of this model of collaboration. This college is over 50 years old, and is well equipped in terms of teaching expertise and learning resources. The school has also been very successful in establishing close linkages with international organisations and local agricultural enterprises to provide training which meets the needs of local economic development and prepares students to move directly into production positions once they leave the college. It has made full use of enterprise resources to deliver this

training, and has involved school teachers in enterprise training, and enterprise personnel in teaching at the school. It has also established joint mechanisms for conducting scientific research.

The major features of this collaborative model is its focus on employment preparation, training by order, and advanced skills training. The college has been able to successfully identify what the market requires by conducting extensive studies of labour market needs and the specialist knowledge and skill requirements of different occupations and jobs. It has then been able to devise comprehensive and specialised programs to meet these needs. This has included the successful integration of both theory and enterprise-based field practice within training plans, and the implementation of an approach to training which recognises the needs of students and the needs of enterprises.

The college has also had to implement strategies for the development of a new type of professional teacher able to integrate the concepts of industrial production and teaching. In addition to developing these dual qualities in teachers, the college has also implemented strategies for the development of highly skilled part-time teachers in specialised teaching areas. To do this, the college has invited renowned professionals and high-ranking managers to deliver lectures at the school. These lectures have covered topics relevant to specialised subjects, professional ideals and enterprise culture. The college has also strengthened its dual focus on scientific experimentation and field practice, so that students are able to develop the required specialist skills which will prepare them for effective employment.

To implement its aims for a 'zero adaptation period' for its graduates, and to meet the demands of the labour market, the college has had to change the way teachers think about their roles, design and modify specialised curricula, and adopt innovative and modern multi-media teaching methodologies. It has also implemented a student-focused approach to training, where student talents are developed to match the requirements of specific jobs, and students are able to study for vocational qualifications.

The college is especially focused on the integration of industrial production and teaching, to ensure that both are enriched by the experiences of the other. For example, the school and the school-run agricultural enterprise are located on the same site, with school buildings situated at the front, and the agricultural enterprise at the rear. The goods produced for profit by the enterprise are directly related to the subject specialisations of the school, while the application of modern and high-tech equipment and agricultural technology in production provides important feedback for curriculum development, and useful services for local farmers. This concept conforms to the principle of 'school at the front, and factory at the rear'.

## The 'combined school-factory' model

In this model the VE school uses its specific expertise and resources to run a combined school-factory enterprise which meets the needs of the local economy. In this way the needs of both teaching and industrial production are fulfilled. In being focused on industrial production, teachers help to increase school profits, while the experience they acquire in this process in turn provides them with useful information for further developing their teaching expertise and improving the content of curriculum.

A practical example of this model is provided by Shuanglou Vocational School in Hai'an, Jiangsu Province. In 1958 this school became the first agricultural vocational high school to be established in China. With the introduction of economic reforms and the open-door policy, the school focused its activities and attention on meeting the needs of the local economy. It modified its approach to education by incorporating new developments in agricultural technology and practices in curriculum, and reforming its administrative processes to establish a new vocational pathway based on the combined school-factory model. The philosophy driving this approach can be encapsulated in the principle 'not rich without teaching and not alive without plant and machinery'.

Rapid advances in technology and increased availability of building materials and machinery also increased the demand for skills in the local area. The school was able to respond to this demand

because it had a long history of working in the engineering field, and it had the required teaching expertise. In 1986 it introduced the first ‘automated control machine plant’, and later established plants for ‘electronic equipment’, ‘vapour engineering equipment’ and ‘heat-treatment equipment’.

To ensure the smooth integration of teaching and industrial production, the principal of the school also became the chairman of the board of directors, and plant director of each plant. In this way, the school was able to administer the plant (factory) and the plant in turn was able to provide a nurturing environment for the school. These activities promoted progress on both sides.

The guiding principle was ‘internal extension, external connection’. ‘Internal extension’ referred to the creation of a ‘research and development group’ made up of highly competent teaching staff; ‘external connection’ referred to the establishment and maintenance of channels of communication and cooperative networks with external work units. The combined school–factory model promoted the further development of VE, and focused school attention on both teaching and scientific research.

Shuanglou Vocational Senior High School, represents a profitable and comprehensive approach to VE. The school established the ‘Hai’an County Sanwei Group Company’ which incorporated the different plants into one group or corporation. The profits strengthened the campus economy and improved the school conditions. In addition, these successes also led to increased VE program offerings and the school has increased the number of classes by five classes each year for the past two years. It has also diversified the types of courses it has provided, including general secondary specialised school programs, vocational secondary specialised school programs, vocational senior high school programs, and short-course training programs. Its students are also highly valued by the community for their technical, administrative and management skills, and the school is admired not only for its training expertise in specialised fields but also for the high quality of its teaching in political and ideological areas. It is also a popular institution for students, and graduates are highly valued by employers. During the past three years, over 300 of its students have won prizes in various county, city and provincial skill competitions. During the last two years, 100% of the graduates of finance and accounting have achieved the national expert standard, and all school graduates have been able to gain employment with almost all (93.5%) finding jobs in their specialised fields.

## The ‘international cooperation’ model

In this model of collaboration the school aims to improve the quality of its teaching, and provision of services to the local economy by reflecting on and utilising the VE experience of overseas countries to improve its own operation, and establishing networks for international cooperation and exchange.

The Beijing Transportation and Communication School provides an example of this model of collaboration. The school, which is also a key vocational school in Beijing, is one of the first of its kind to set up linkages with overseas educational institutions and experts, and enterprises. The school’s mission was to provide training that would assist in the development of the Beijing economy and its transportation and communication industries. It also aimed to become a state-of-the-art transportation and communication institution. It modernised its traditional approach to VE by importing and utilising overseas philosophies and practices, focusing on the vocational aspect of training, and reforming its traditional credentials-based education system. In doing so, it strengthened its collaboration with local and international enterprises.

In 1994, the school established linkages with the Japanese Toyota company in China to set up a Toyota T-TEP skills training school in Beijing. For the past ten years it has imported educational theory, curriculum, training methodologies and equipment and teaching materials. These collaborative efforts have played an important role in reforming curriculum used for providing skills to the automotive transportation industry. The school has established collaborations with Japanese, German, United Kingdom, and American, and Dutch companies (Toyota, BASF, Quivira, Dupont and Sikkens). In 2004, the Toyota Company recognised the school as a T-TEP model school. In 2000, the school also developed and delivered the ‘automobile design and decoration’ course jointly with the German BASF company, which had established its Beijing office and training centre at the

school. In 2001, the school collaborated with the United Kingdom company, Quivira Education Development Pty Ltd, to establish and deliver courses in automotive sales, sales management, international trade and overseas marketing.

At the same time as it was strengthening its international networks, the school was also extending its linkages with domestic enterprises. It established regular arrangements for students and teachers to undertake field practice placements in a large number of enterprises. For example, the school has established a stronger relationship with the Beijing Auto Repair Company, one of the top 500 enterprises in China. The company helped the school to set up a modern automobile maintenance and repair centre. It also established a Beijing Transportation Education Award, which is granted to outstanding teachers and students. The school also helps the company in its recruitment by identifying and selecting outstanding graduates for jobs. Working with the company in this way provides opportunities for the school to better understand enterprise needs, implement appropriate technical training, and consolidate the position of the school's technical training department.

In conjunction with BASF the school has also opened the Yaliang Project Consultancy Company. This company provides consultations on the technology of car painting and repairs, and undertaken car painting and repair services for a fee. It also sells paint products and helps small businesses to refurbish their automotive repair workshops. In doing so, it subscribes to the principle of 'factory at the front and school in the rear'.

On the tenth anniversary of its cooperation with the Japanese Toyota Company, the school set up the 'Toyota Class' to deliver customised training for enterprises. Upon graduation, students are awarded a technical certificate which is recognised by Toyota. This enables them to take up employment in Toyota 4S shop and maintenance workshops. The school has thus achieved its goal to provide customised training.

The school also aimed to extend curriculum reforms by adopting the German dual system concept of training. In 1999 it commenced a pilot program and in 2003 the students from this program graduated. Based on their success with the dual system and the Toyota programs, the school has commenced a new round of teaching reforms and scientific experimentation. The school has confirmed the integral role of 'field practice' in the German dual system, and the importance of constantly reviewing teaching plans to adapt overseas practices to the Chinese situation. The school has implemented the 'Zhu Zhou Bing Xing' reforms to ensure that training and education are focused on the development of vocational skills and abilities. This coincides with VE philosophy in advanced economies like Germany and Japan. However, schools were to be the major arena for VE in China, with theoretical subjects supporting the training received in field practice placements much like the situation in the United Kingdom.

The school has achieved considerable success. Its curricula are closely related to the needs of the labour market, and graduates are valued by employers. This has increased the reputation of the school among potential students. For the past five years the school has achieved top ranking in student recruitment among similar schools in Beijing.

## Summary

In summary, the Chinese experience in recent years underscores the importance of linking VE with the development needs of the economy and providing mutual benefits for both schools and enterprises. However, school-enterprise collaborations may also be dominated by government, schools or enterprises. These three forms of collaboration may run independently of each other, or alternate in importance at different stages of the relationship.

Where the government takes the lead, it is responsible for the overall management, planning and coordination. It administers central control of finance and resources, and promotes the importance of healthy cooperative action. Where the school takes the lead, it is responsible for developing training-by-order programs, providing services for enterprises, and promoting mutual benefits. It administers school-run enterprises, and concentrates both on production and teaching. Where the

enterprise takes the lead, it is responsible for initiating the collaboration, and uses the expertise and resources available to the VE school to produce quality outcomes.

## Linkages between industry organisations and associations and VE

China's industry organisations and associations have grown and developed with the implementation of economic reform and the open-door policy. Establishing strong linkages with VE for these associations ensures that VE is able to adapt its training provision to the needs of industry. So far they have been generally successful in developing strong linkages between VE and their industry sectors. However, the associations tend to be more concerned about what VE can do for members of their association rather than what it can do for the community as a whole. In addition, they are more interested in specific skills training than in general vocational education. Although China has implemented institutional reforms to address these issues, they continue to be a challenge.

### Industry organisations and associations in China

Industry organisations and associations are an important part of the economic environment in China. They represent the interests of individuals and enterprises, public institutions, research institutes and trade organisations in specific industry sectors. Members may come from all parts of the country, and from all types of departments and enterprises. In addition to protecting the legal rights and interests of their members, they are also responsible for promoting the development of the industry sector for which they are responsible. Their guiding principle is to serve their industry sector and enterprises, the government and society, and to promote industry and economic development.

Although they are voluntary, self-governing and not-for-profit organisations, industry organisations and associations must also implement and adhere to government policies and legal regulations, and carry out work entrusted to them by government. In so doing, they act as bridges between government and enterprises. Because of this 'go between role', industry organisations and associations are also able to convey the wishes and demands of enterprises and institutions to the government, and at the same time disseminate information on government policies and intentions. Their knowledge of their specific sectors means that they are in a position to better understand the actual needs of industry sectors and enterprises, and speak about these needs to institutions and individuals from other industry and community sectors.

According to Ministry of Civil Administration statistics, there were 39 000 industry organisations and associations by late 2002. These represented 29.3% of all 133 000 registered organisations in China. Industry organisations and associations are of three major types. The first of these is industry organisations and associations with strong government roles. For example, in mid-February 2001, the State Council announced the closing of nine national trade bureaus established by the National Commission of Economy and Trade, and the establishment of ten comprehensive government industry organisations and associations. These included the China National Textile and Apparel Council, China Machinery Industry Federation, China National Coal Association, China National Light Industry organisations and associations, China Petroleum and Chemical Industry Association, China Building Materials Industries Association, China Iron and Steel Association, China Non-ferrous Metals Association, China General Chamber of Commerce and the China Electricity Council. The State Council allocated some government functions to these associations. The second type is semi-government controlled industry organisations and associations. For example, a number of industry organisations and associations are established by government institutions. The other type is the self-regulated association. These are mainly set up in the regions where the market economy is well established, such as Zhejiang Province. The establishment of these industry organisations and associations is to limit the development of unrestrained competition.

They have been especially effective in voicing the needs of their industries to VE providers, and in providing assistance in the development and delivery of relevant training. In so doing they have made a special contribution to the further progress of VE in China, and to meeting the needs of trade and enterprises for skilled workers.

## The VE involvement of industry organisations and associations

China has a tradition of involving industry in VE. This tradition is demonstrated by policies and regulations aimed at encouraging industry organisations and associations to participate in VE, and the setting-up of a formal mechanism to enable this participation—the ministries' liaison meeting system. For their part, industry organisations and associations view participation in VE as an integral part of their roles.

### *Government has formulated and implemented policies that encourage industry to become involved in VE*

The Chinese Government values the participation of industry in VE. For example, Clause 23 of the *Vocational Education Law* of the People's Republic of China states: 'Vocational schools, and vocational training institutions should integrate education with industrial production, aim at serving the needs of local economic development, and maintain close ties with enterprises, thus helping trainees to acquire practical skills and become skilled workers'.<sup>22</sup> The State Council's 'Decision on devoting greater efforts to the reform and development of vocational education' also highlighted the need to extend VE reforms by involving government, enterprises industry organisations, and the general community in the development of a VE system which would meet the needs of national and local economic development. In addition, the Administrative Department for Industry was made responsible for coordinating and supervising the VE system and continuing the role of vocational schools and vocational training institutions. The government also commissioned industry organisations and associations to forecast and report on industry skill shortages and the supply of and demand for human resources. They were to establish industry training plans, participate in the development of curriculum and course materials, and teacher training. They were also to monitor the delivery of VE, and make arrangements for staff training and vocational skills assessments. Associations were also able to establish and run vocational schools or vocational training institutions.<sup>23</sup>

In 2002 the Ministry of Education, National Economy and Trade Commission and the Ministry of Labour and Social Security Welfare, also confirmed the importance of industry involvement in VE (Jiao zhi cheng 2002). Industry organisations and associations were to be involved in forecasting industry needs, supervising the recruitment of students and workers, and in planning effective strategies for the delivery of VE for their industry sectors. This included forecasting industry needs for labour and skills, recruiting new students for VE courses and graduates for employment in areas of specific skill shortage or need. It also included developing plans for the grading of skills for identified occupations and establishing a skills assessment body for their industry. Industry organisations and associations were also to organise and supervise the development of curriculum and learning materials for their particular areas, and for teacher training. They were to provide support and resources for the delivery of VE training, and to organise and provide assistance in evaluation and assessment of VE. They were also able to set up vocational schools or training institutions independently or in partnership with others. In addition they were charged with disseminating VE information to their industry sectors.

Under government guidance and instruction, national trade organisations must ensure that their industry sectors actively participate in VE by coordinating and supervising the work of local and regional trade organisations. They must also provide timely reports on the progress of their activities.

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<sup>22</sup> See relevant content in the *Vocational Education Law* of the People's Republic of China.

<sup>23</sup> See relevant content in the State Council, 'Decision on devoting great efforts to the reform and development of vocational education'.

### *Government has established a mechanism for industry involvement in VE: The Joint Ministerial Liaison System*

In order to implement policies for increasing the participation of industry in VE, the Ministry of Education, Ministry of Finance, Ministry of Human Resources, Ministry of Labour and Social Security, Ministry of Agriculture, and Office of Poverty Support of the State Council have established a joint VE ministerial liaison system. This was approved by the State Council. All the departments involved have definite responsibilities and must jointly promote the development of VE in China. They must make sure that funding is available, and develop relevant policies and regulations to support the implementation of VE reform. So far, they have held the first meeting.

### *Government has formulated a relevant system*

The main goal of industry organisations and associations is to further the development and progress of their industry sectors. One of their major responsibilities is ensure that their sectors have access to adequate skills through appropriate training. Therefore, industry organisations and associations regard the development of training for their particular sectors as one of their major roles and responsibilities. This is highly evident in their publications.

For example, the China Apparatus and Instrument Industry Association aims to strengthen the pool of skilled labour and human resources for its member institutions/enterprises through the organisation of overseas training and study tours and importation and training of skilled workers. In addition to specific responsibilities for identifying training needs and technology and skill requirements, the China Iron and Steel Industry Association also confirms its responsibility to organise relevant business training, and to investigate and formulate standards, criteria and methodologies to be used in assessment for skilled and technical occupations. Its role is to promote the uptake of these by association members, as well as conducting inspections and evaluations. It is also charged with assisting the government to supervise the implementation of reforms and improvements of substandard products and enterprises.

The China Light Industry Federation also views standards development, and the organisation, delivery and supervision of skilled training as major responsibilities. It also sees its role as helping to formulate and revise national industry standards and making necessary arrangements for their implementation.

The China Cosmetology Association identifies its role as assisting the government to research and formulate trade regulations and standards. It also aims to conduct all types of competitions and industry training, and to participate in exchange and collaborative activities both domestically and overseas.

The China National Textile Industry Council indicates that the revision, development and implementation of trade standards is one of its key responsibilities. Another major task is to make arrangements for the training of specialists and skilled workers in all types of textile industry occupations.

The constitution of the China Electronic Components Association also identifies the training (via various methodologies) of skilled and managerial personnel for enterprises and institutions. It also speaks about the need for the association to cooperate closely with tertiary educational institutions to implement the training.

In summary, it is clear that trade/industry organisations and associations have embraced vocational education and training to be a key function, and have included within their constitutions specific responsibilities for participation in VE.

### *Industry organisations and associations are focused on VE*

China's industry organisations and associations generally have a special department and or training centre dedicated to vocational education and training. For example, the China Coal Industry

Association has in place a human resources training department, which participates in formulating and revising standards and regulations for skilled occupations and for maintaining and improving quality. It also helps to identify skill requirements for the industry, and organises and supervises the implementation of standards and regulations in member enterprises and institutions. It helps to deliver specific coal industry staff training, and organises business and management training in different occupational areas. The department is involved in the development of coal entrepreneurs (business managers), supervision of the management of these coal enterprises, and promotion of modern approaches to the administration of coal industry enterprises.

The China Coal Industry Association has also established a training centre. The centre provides member and other coal industry enterprises with specialist knowledge and skills training for staff, and management training for enterprise managers. In so doing, it helps to solve problems of shortages of industry-skilled workers and modern managers. In addition, it helps the majority of remote area enterprises update knowledge and skills.

The human resource department of the China Mechanical Industry Association is commissioned by the government to be responsible for the development of specialised and senior-level skilled workers in the industry. It is in charge of training associated with government-commissioned training programs.

The China Association of Shipping Agencies also clearly states that its business is to conduct all types of industry training and to make arrangements for association members to study maritime law, international convention, navigation practice and common practice.

The China Construction Education Association is a specialised social organisation under the guidance of the Ministry of Construction. Its goal is to actively promote educational reform, provide training services for the development of senior-level skilled workers and specialists, and implement further advances in socialist construction skills training and education. To do this the association aims to:

- ✧ investigate the principles and methods of construction skills training and education as it applies to the Chinese environment, and develop, formulate, and implement plans for academic research
- ✧ organise research on special issues in construction education, coordinate discussions, and provide consultancy services and advice to governing (authority) departments
- ✧ cooperate with relevant government departments to actively implement educational reform trials and business training, and carry out relevant work and service entrusted to it by the Ministry of Construction
- ✧ supervise and coordinate the activities of all institutions delivering and researching in the area of construction skills training and education and provide services as required
- ✧ research trends and experiences in construction skills training and education in China and overseas, and undertake international academic exchange.

Eight specialised education committees, each with its own work regulations and work plans, help the association carry out its responsibilities. Each year the committees hold an annual general meeting, and meetings and conferences of specialised skill areas.

### *Diverse activities of industry organisations and associations*

In all, China industry organisations and associations are very focused on their VE work. However, due to their different backgrounds, the nature of their VE work is at different stages of development.

The Excavator Branch of the China Engineer Mechanical Industry Association has conducted a pilot training program for its engineering mechanics. The Road Engineering Branch has conducted three training classes in the use of tar mixing equipment technologies with a total of 283 trainees undertaking the program. Extensive training materials have also been developed.



Industry organisations and associations, through their specialised institutions, have also conducted other types of VE. For example, the China Cosmetology Association has held training classes for national-level judges, and training for the China National Team.

The China Electric Power Industry Association has also provided systematic and comprehensive VE work for its industry. The association has established the Electric Power Vocational and Technical Education Committee of the China Electric Power Education Association. The main responsibilities of this committee are to:

- ✧ organise research into the principles of VE for the electric power occupations
- ✧ develop and formulate a strategy of education and training and conduct an analysis of the available labour market
- ✧ organise the formulation of standards and criteria in the education and training of all levels and types of specialised skills and talents in the electric power industry
- ✧ conduct relevant quality evaluation and appraisal
- ✧ organise further education and on-the-job training with an emphasis on the training of senior-level managers and administrators, specialised technical workers and education and training managers in enterprises
- ✧ organise, coordinate and conduct the development of modern long-distance VE and training programs
- ✧ organise, and support the exchange of services and information about VE in the electric power industry.

The Electric Power Vocational and Technical Education Committee is not only committed to its industry responsibilities to participate in the provision of VE, but also to relevant research and the development of curriculum and teaching materials. It is concerned with the development of teachers and in building up the teaching force in the areas.

It is clear that China industry organisations and associations are not only involved in planning for, organising and delivering VE and training within their own industries, but they are also required to represent their industries in national VE activities. Along with the Ministry of Education, the already mentioned VE teaching and supervision committees have responsibility for identifying 80 occupational specialisations (out of a possible 307) for focused development.

Some industry organisations and associations have also made great advances in setting up a VE system within their industries. For example, Shanghai Real Estate Industry Association and Shanghai Jiaotong University have jointly developed a VE system for the training of middle and senior managers and administrators. This system has been well received by many, especially the trainees, and the model of training used has also been implemented throughout the nation. It has been nominated for the 'Jiu Shi' Award for its achievements in developing the city's land and resources system and educational research.

In the past year, it has established a set of resources, including grading standards for real estate qualifications in professional management, temporary regulations for qualifications, new student enrolment policies, and general training administrative processes. It has also established training resources, including curriculum, syllabus, textbooks, teaching materials, and examinations. Until now, project development groups have produced four books complete with copyright. They are entitled *Basic management knowledge and skills for professional managers*, *Evaluation and training of managerial and leadership ability of real estate professional managers*, *Basic system and policies of real estate*, and *Investment and evaluation of real estate*. They are also currently in the process of producing another two textbooks, *Real estate finance*, and *Development and management of real estate*.

### *Limitations of industry participation in VE*

Although industry organisations and associations in China are involved in the development and implementation of programs for VE programs within their industries, they also face a number of

challenges. Firstly, they are more concerned with technical training than education. Secondly, the training that they do provide is available just for their members and not for other individuals or organisations, and thirdly, they lack independence and initiative.

For example, the China Coal Industry Association's training centre provides short training programs for existing workers in technical and management positions in local coal enterprises. We maintain that, because it is a voluntary association of individuals and organisations, the association is indeed within its rights to just provide training for its members. However, we also believe that they need to consider expanding the scope and accessibility of training, so that training outcomes can be improved, and used to better serve the needs of industry development.

It is also clear that many industry organisations and associations are focused on administration rather than innovation. This is in part due to their particular evolution and in part due to the fact that they are not viewed as independent agents in the economy. Indeed many government administrative departments treat industry associations as an extension of their operations. In addition, although industry organisations and associations are supposed to be voluntary federations of enterprises in the same industry, their establishment is in the main driven by government not industry initiatives. This is evidenced by the fact that the chairman of the board and the secretary general of an industry association is selected from government officials. As a result, a culture of administrative control rather flexibility and innovation tends to emerge. This then does not always make it easy for associations to serve the needs of their enterprises.

### *Summary*

In summary, industry organisations and associations continue to be the main vehicles for involving industry in VE in China. They have reflected the importance of VE in their policies and regulations, and have done much to be involved in the development and provision of training services to their industries. However, their historical evolution has also led to a strong culture of administrative control which limits their ability to develop and implement creative VE solutions for their enterprises.

## Effectiveness of collaboration

In recent years, China's industry organisations and associations and enterprises have become more active participants in VE. They have increasingly realised the importance of combining industrial production with education and have achieved initial successes in developing effective linkages with schools.

There has also emerged a new way of thinking about collaborative education within educational philosophy. This thinking is focused on the integration of VE reform with regional economic development, social modernisation and industrial re-structure. In addition, industry and enterprise needs for labour and skills have emerged as the main drivers of VE. Reforms have also confirmed the importance of preparing students for work, and fostering student creativity, practical skills, and technical talent.

A difference in the way that collaboration is conceived and implemented has also arisen. Today it includes the joint development of products and allocation or accessing of education and training resources. In addition, parties in the collaboration are urged to think in terms of what each can bring to the collaboration, so that the needs of the labour market can be addressed. They are also asked to think in terms of the 'mutual benefits' that can be derived from the relationship. Concepts of collaboration now also include the provision of off-the-job education and training based on industry requests, and the provision of practical training places according to the requests of schools and vocational education institutions (generally referred to as training by order). It also includes the sharing of common management structures. A new industry-based approach to the supervision of

VE has also been implemented, with the establishment of the VE and teaching supervision committees already mentioned.

There has also been a realisation that teacher competence is a key factor in raising the skill levels and flexibility of vocational school graduates. To ensure that students have access to teachers who have the practical skills and techniques required by industry, arrangements have been made for teachers to undertake practical on-the-job training placements in industry, and for technical experts from industry to spend time in schools and vocational institutes as part-time teachers. A 'buddy' system has been set up for teachers to work closely with a partner from industry to improve their practical production skills and their ability to solve practical problems in the workplace. Such strategies have helped to address the lack of practical workplace experience of a teaching force which is made up of tertiary education graduates.

## Problems and solutions

China's economy has grown dramatically with the implementation of economic reforms and the open-door policy. During this time collaborations between industry and schools and vocational institutes have also increased and have helped to provide the skills and talents required by enterprises. In spite of the great many examples of successful collaborations between educational institutions and industry to date, participation in VE is not a priority for many industry organisations and enterprises. This has meant that the development of VE has not been able to keep up with the pace of economic growth. Analysing the reasons for these problems may help us to develop some useful policy recommendations, which will in turn, inform the further development of the Chinese economy.

Four major factors have restricted the expansion of VE–industry linkages in China. Firstly, China's traditional devaluing of practical skills and talents and revering of academic qualifications has limited the willingness of industry to become involved in collaborative technical training programs. As a result, they have not taken the initiative to make involvement in this type of training a priority in their business planning. Nor do they see this as an effective strategy for improving the skills of existing workers or increasing the pool of skilled workers.

Secondly, differences in the organisational cultures of schools and enterprises also limit the shared understandings required to drive effective collaborations. This is because enterprise culture revolves around strategies for achieving financial profits and other economic benefits, while school culture is focused on provision of equal educational opportunity and a commitment to public welfare.

Thirdly, ineffective administrative mechanisms have restricted the extent of industry participation in VE. The introduction of the market economy led to a gradual shift of responsibilities from central government ministries and departments to local government areas. In addition, the gradual closure of former administrative departments and ministries responsible for industry led to the devolution of ownership and responsibility for the national economy. The vocational schools and institutes which had been run by industry organisations and associations and enterprises gradually came under the administrative control of local area governments. This meant that industry organisations and associations and enterprises gradually became increasingly less interested in participating in VE. Where industry continued to be involved in collaborations, their endeavours did not always adhere to relevant policies for labour and human resources, remuneration, and occupations and vocational qualifications titles.

Industry participation in VE was also hindered by ineffective administrative mechanisms, and lack of incentives for employers. It is clear that the government has not invested sufficiently in financial incentives and reward programs to encourage enterprises to participate in VE. It has not implemented a system of tax incentives for those enterprises prepared to participate in the provision of VE, and has not paid much attention to rewarding participating enterprises with specific commendations or awards. We believe that taxation policy reform would provide direct incentives for encouraging increased participation among industry.

## Implications for policy

There are also a number of policy considerations that have been derived from the analysis of the findings for China. Firstly, if we are to increase industry participation in VE, it is important to create laws and policies conducive to this collaboration. The current laws on general and vocational education and labour have few or no clauses which deal with the practical implementation of industry–VE collaborations. Those clauses that do deal with this topic often describe general goals, aims, and policies. This must be addressed. To ensure that industry accepts its responsibility to participate in VE, and to advance VE development, we recommend government revision of vocational education and other relevant laws. These revisions should specify and regulate the VE roles and responsibilities of schools, enterprises and administrative agencies. They should also deal with operational issues, teacher qualifications, and the targeted student recruitment. The government should also investigate and formulate additional policies for increasing industry participation in VE. However, these should be introduced in a timely manner to acknowledge the different stages of economic development of industries and enterprises. Such well-timed government action will help to increase community understanding and acceptance of what must be done, and thereby reinforce the importance of enterprise participation in VE.

Secondly, institutional frameworks, rules and regulations which enable the effective operation of industry–VE collaborations must be established. An institutional framework with articulation pathways between accredited vocational education and academic education is essential if we are also to create a VE system in which industry plays a significant role. In addition to opening different forms of education to greater numbers of students and existing workers, such institutional reforms will also affirm accredited vocational education as a significant and viable pathway.

It is also clear that, if industry is to establish VE partnerships with schools and other institutions, it will require substantial support from educational leaders in local area governments. Equal valuing and treatment of vocational education and general education will also ensure that vocational qualification certificates and academic certificates have parity for university entrance and employment.

Thirdly, it is also necessary to investigate different ways of driving industry participation in VE and give precedence to models based on effective goal-setting and strategic planning. As already noted, VE in China is in the process of shifting from a supply-driven system under the control of the national government, to a demand-driven system under the control of the market. It is also gradually shifting towards an education system which is governed by both educational and economic principles, and must operate in an open training market comprising multiple suppliers, multiple consumers with diverse needs.

In addition, it is also worth promoting the following three models of collaboration. The first is the enterprise self-governance model which is suitable for large growing enterprises. Here the enterprise uses its own resources to run an independent vocational school to provide training which meets enterprise needs. Such a model makes sense for these types of enterprises because they have the economic resources, high demand for skills, and large numbers of staff and workers requiring training. The second model is the enterprise cluster model based on the establishment of a VE centre by a group of enterprises. Here VE is jointly administered via a steering group comprising representatives from the different enterprises, government and education. It is funded by the enterprises within the cluster and operates for the mutual benefit of its members. The centre also provides services to other enterprises that may not be part of the cluster. The third model comprises partnerships between enterprises and schools and institutes, whereby enterprises commission these institutions to provide the required skill training. Here enterprises and schools sign an agreement in which both agree to provide training to develop the skills required by industry. Both are involved in providing services for a fee. The school provides the specialised theory training, and the enterprise provides the practical training and the practical training placements. In this way they both help to nurture the professional talents of individuals and those required for enterprise development.

# Country comparisons

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The establishment and maintenance of VE–industry links in China and Australia in recent times have mainly been driven by government policy to meet economic imperatives. In both countries the purpose for creating or improving linkages between industry and VE has been broadly similar. There has been an endeavour to ensure that industry skill needs provide direction for the development of VE curriculum and training programs, and that practical industry experience remains the vital ingredient for vocational skill acquisition, especially for apprentices and trainees, and increasingly, for students in other vocational programs. The ultimate aim for each country is to have a training system which can provide the skills required for industry to remain economically competitive. However, it is also true for both Australia and China, that the development of VE linkages in practice is heavily dependent on the active commitment by industry bodies, local principals and enterprise managers to implement government policy. It is also dependent on the availability of human and material resources to enable them to do so.

Despite these similarities, however, there remain some very important differences in the strategies that have been adopted in each country and the contexts in which these are expected to operate. These include different starting points, traditional values placed on vocational education and training vis-a-vis academic scholarship, and different political and economic philosophies.

## Similar goals and practical considerations

Governments and industry bodies in Australia and China have espoused formal support for increasing, maintaining, and improving VE–industry linkages. This support is based on the assumption that better VE–industry linkages will provide more accurate information on industry skill needs, and that these can then be used to identify the education and training required to meet these needs. In addition to improving the match between industry needs and education and training provision, better VE–industry linkages are believed to help to improve the viability of existing and emerging industries and local economic development. It is also based on the premise that such linkages can help to provide both students and existing workers with the skills and knowledge that will enable them to compete effectively in the labour market. Collaboration is thought to provide mutual benefits for each party in the relationship, and benefits for the society as a whole.

At the systemic level, VET–industry linkages in Australia have been strengthened by policies which have aimed to create an industry-led system. This overarching structure has been organised such that industry is given a formal leadership role in the development and review of competency standards and guidelines for the assessment of performance, and in providing advice to government on industry trends. The national voice of industry is channelled through industry skills councils, which have government-endorsed responsibility for these tasks. In addition, the training role of industry is also legislated via legally binding training contracts between employers and their apprentices and trainees.

However, the practical implementation of national policy aimed at encouraging VET–industry linkages at the local community and institutional levels, whether it be in China or Australia, is dependent on two main ingredients. First, both industry and educational institutions need to acknowledge the relevance of such a relationship. They must believe that it can lead to mutual benefits, and must be prepared to do something about this. Second, there need to be sufficient

resources available to both parties and commitment from relevant individuals (for example, senior managers and administrators) to drive the establishment and maintenance of the relationship.

It is at the local level that the operation of VE–industry linkages must have the most influence. The establishment of effective linkages between industry and secondary schools in Australia is driven by the extent to which schools are committed to providing formal VET in Schools pathways, including school-based apprenticeships and traineeships for their students. These programs are especially reliant on the identification of employers who are willing to be involved in these formal programs, and who will be prepared to continue to be involved. However, in both China and Australia local implementation has often been hindered by lack of sufficient motivation and commitment from industry to participate in VE.

## Similar processes for gathering industry advice

Formal bodies and organisations which provide advice to government on the needs of specific industries, and which are involved in the development of guidelines for training have been established in Australia and China. The formal voice of industry for the national VET system in Australia are the ten industry skills councils, each representing an amalgamation of related industry sectors. Their role is to provide information on industry trends, future skill needs, and training requirements. They are also charged with developing and reviewing training packages which identify the competency standards and qualifications for occupations. Although they do not develop curriculum or teaching materials, they are also expected to provide advice on the suitability of a variety of training products. The formal voice of industry in China is provided by the 39 000 or so industry associations and organisations whose main role is to serve their industry sectors and enterprises within these sectors, and to act as a conduit for providing industry information on industry requirements (including forecasts of industry trends and skill shortages and training requirements) to government, and government policy to industry and enterprises. In addition, there are ten comprehensive national industry organisations and associations that also undertake this role. However, unlike the Australian industry skills councils, each of which represent a combination of related sectors, all except one of the Chinese Government industry organisations are industry-specific, and are focused on those industries which are of crucial importance to the economy.

In both countries, individual VE institutions establish their own networks and linkages with suitable industry partners, and in both countries, there is an opportunity for schools and enterprises to make requests for customised training, either in the workplace or at the school. There are also arrangements for teachers to move into industry to develop industry-specific skills and current technological expertise, and for industry personnel to come and provide training in schools. In Australia an enterprise which satisfies certain conditions for registration can also gain registered training organisation status which enables it to deliver accredited training.

## Different starting points

In comparing the development of forms of VET–industry linkages in Australia and China, it is also important to understand that, although both countries see benefits of this collaboration as improving economic standing for industries, nations and individuals, they have experienced different starting points. The development of expertise has always been based on the passing on of skills and knowledge from experts to novices in China as in Australia. Although the concept of apprenticeship training has been a feature of the development of trade skills in China since the Shang Dynasty period (1766 to 1121 BC), the craft guilds approach to training (popularised in Western Europe during the Middle Ages), has not been a part of the Chinese system. Australia, on the other hand, has adopted the craft guilds system of training since colonial times. Nevertheless, the German dual system of apprenticeship training was introduced in some Chinese schools on a trial basis in 1984. The school was to be the main arena for training, with on-the-job field placements used to supplement school

learning. This is another major difference between Australia and China. The main arena for apprenticeship training (in terms of proportion of time) in Australia is the workplace, with off-the-job training (in post-school educational institutions) supplementing the skills learnt in the workplace.

Australia has also applied such concepts to newer occupations and those which have not had a tradition of apprenticeship training. In terms of developing these modern apprenticeships, Australia has had a head start. Such modern forms of apprenticeship are relatively new and not widespread in China. These different starting points have their foundation in the differences between the political and economic philosophies of Australia and China. However, the use of the school as a workshop producing and selling goods as a way of improving resources available to the school is a particularly Chinese feature. It has not traditionally been common for schools or educational institutions in Australia to have to raise their own finances for operational purposes. However, with the opening-up of the training market to private providers in the early 1990s, TAFE institutes have been engaged in the provision of training services or production of texts for commercial purposes.

## Different valuing of VE pathways

There are also relative differences in the values placed on vocational education in Australia and China. Although academic education by comparison with vocational education also has a higher premium in Australia, an apprenticeship pathway has always been considered to be a respectable training pathway. Indeed the prime minister and the national minister for education, science and training, have recently encouraged secondary school students to consider taking apprenticeships as a more viable pathway than university. Increasingly, other VE pathways are also becoming acceptable to students and their parents. In terms of student numbers, the VET sector, which includes apprentices, trainees and other VET students, represents the largest tertiary educational sector. Although the Chinese Government attaches considerable importance to VE in China, due to historical and cultural reasons VE has not been valued to the same extent as in Australia. This has a bearing on the ability to attract students to vocational education pathways. It also influences the extent to which schools and industry are motivated to establish closer collaborations.

## Different economic and political influences

Industry–VE involvement (especially in apprenticeship training) has traditionally been sensitive to fluctuations in the Australian economy, with employers willing to take on apprentices in good economic times, and being less willing to do so in times of economic recession. The Australian Government has also used financial incentive schemes rather than policy directives to encourage industry participation in VET, and to provide financial support to employers who take on apprentices. It has also allocated substantial financial and other resources to the reform of the total VET system, and to the establishment of information-gathering and advisory structures to enable VET to become and remain responsive to industry needs. These approaches have remained relatively unchanged, regardless of which Australian political party is in power.

In contrast, changing political philosophy, espoused by different government regimes in China, (especially between 1949 and the mid-1970s), has fundamentally altered the operation of VE and the development of industry–VE linkages in the second half of the twentieth century. For example, the establishment of the People's Republic of China in 1949 favoured the concept of combining productive labour with education, and along with government-run schools, schools were also run by factories, mines, enterprises and agricultural cooperatives, thus forming a strong VE–industry linkage. The Cultural Revolution (1966–76), however, saw the virtual elimination of industry schools and vocational education. Subsequent initiatives (the open-door policy, and the drive for economic modernisation) have led to the development of the socialist market economy, and restored the concept of combining industrial production with education. The restoration of schools and institutes whose main focus was the development of general and specialist vocational skills, knowledge and talents

meant that there was an acknowledgement of the need to provide training which would be relevant to the development of the basic and specialist skills and technologies required by the market and the needs of modern economic society. Today, government policy continues to guide the provision of VE in China, and to require schools and industry to collaborate in the establishment of local development plans and the restructuring of local industries. However, a number of factors have weakened industry involvement in VE. For example, the re-organisation of government departments in 1997 eliminated the role of those departments responsible for administering certain industry sectors. The reduced demand for human resources from labour-intensive enterprises, and the increased availability of labour, means that enterprises are able to get recruits directly from the labour market. The surplus of job applicants for available job vacancies also means that enterprises are able to buy in already qualified employees directly from the labour market. There is also a lack of powerful incentives for enterprises and industries to become involved in VE. In addition, VE has not always been able to provide the human resources required to meet the real requirements of enterprises and industrials.

## Different approaches to education and training

Other influences on the development of increased VET–industry linkages in Australia have been the introduction of competency-based training and flexible delivery as key training methodologies to be used in vocational education and training. In the Australian VET context, competency-based training refers to training in which the achievement of competency is gained through a demonstrated performance of the behaviour expected in the workplace. Such a method was originally introduced, in part, as a way to convince employers and industry that providers could deliver skills required in the workplace. The involvement of industry in the identification of competency standards on which units of competency and assessment would be based was also another means of encouraging industry participation in VET. In China there is a system of ‘tailor made’ training. Here enterprises put forward their requirements for competencies, and enterprises and VE institutes jointly develop the curriculum according these requirements. However, such programs are customised to the competency needs of individual enterprises. Although different VE colleges are also able to customise programs for individual employers in Australia, China does not have a national system of competency standards for a particular industry sector to draw on.

Under the umbrella of flexible delivery, Australian VET students, including apprentices and trainees, are free to determine how, when and where they will undertake their training. They can also choose the time at which they are ready to be assessed. This increased flexibility was also aimed at providing training which was customer-focused and linked closely to industry need, both in terms of content and also in terms of flexibility of access. It was argued that increasing customer-focused training would also encourage employers to engage with training. In the main, VE in China is delivered via traditional formats with some opportunities for working in teams, with independent learning having been introduced into some schools in recent times.

Another major difference between China and Australia is the locus of accredited vocational education and training provision. Although since the mid-1990s there has been a dramatic increase in the provision and uptake of accredited vocational education and training in the secondary school sector in Australia, the great majority of technical training occurs when school is over. This is not the case for China where the great majority such education occurs in secondary schools.

Education and training in Australian VET is aimed at providing technical knowledge and skills and other attributes required by industry, in the hope that these will enable the individual to become more marketable in the labour market. Since 1999 the aim in China has been to implement a qualities-based education system aimed at developing the all-round skills and talents of students. Keeping in mind that the majority of VE occurs in secondary schools in China, this is not surprising. The mandate of secondary schools up to the age of compulsory schooling in Australia, however, is also to provide students with a general all-round education. However, the concept of qualities and talents is not common. As the majority of VE training occurs when secondary school



is over in Australia, there may be a view that, at this stage of an individual's life, it is time for the development of specific skills and attributes rather than all-round skills and attributes.

Another difference in educational philosophy relates to the concept of involving VE teachers in scientific research, recently adopted as an objective of Chinese VET. Its aim is to further develop, promote and apply new technologies in training and to use such technologies to improve the quality of practices used in local industry and agriculture. Combining research with teaching in vocational education and training institutions is not a widespread practice for VET teachers in Australia. However, small numbers of teachers in TAFE colleges are increasingly becoming involved in research (generally research connected with teaching and learning). In the main, however, the development of new technologies occurs in research and development of commercial enterprises or government agencies, in universities, and in cooperative research centres, which are joint operations between universities and industry.

## Different roles for industry bodies

Industry organisations and associations in Australia and China exist to protect the interests of their members. However, the mandate of these bodies in China is also to undertake roles proscribed to them by government, thereby enabling them to act as a bridge between government and the industries they service. Providing a bridge between government policy and industry in terms of the development and implementation of training policy is the role of government-established industry skills councils in Australia. The government also provides encouragement for such organisations to become involved in training by making funding or incentives available for their involvement.

## Different models of collaboration

VE–industry linkages with regard to Australian apprenticeships generally follow similar patterns: there is a legal contract between employer and apprentice (or guardian) setting out conditions for work and training. Outside these training contracts there is great flexibility in the types of linkages that are established between schools, VET colleges and industry.

China has examples of industry being involved in the management of schools and evaluation of teachers. Although there may be opportunities for industry to have a representative in the governance of Australian schools or VET college councils or boards, the day-to-day management of educational institutions is left to the management team of that institution. There is also no tradition of enterprises evaluating the work of teachers.

The recent emphasis in China of training professional teachers to have both pedagogical qualifications and specialist industry production skills and knowledge has its counterpart in school-based VET in Australia. However, the tradition in post-secondary school VET programs up until very recently has been, in the main, to hire individuals with industry expertise and qualifications, and to provide them with professional teacher training.

## Concluding remarks

Effective industry–VE linkages are essential in Australia and China if industry requirements are to inform the development of relevant training programs, and students and existing workers are to acquire relevant skills and knowledge. Successful collaborations provide a useful mechanism for identifying strategies to ensure that both nations have available to them workforces which have the skills required by current economic markets. The challenge is to enable both schools and industry to get the most out of the linkages without losing sight of their central purposes. For industry it is to produce goods and services for sale, and for schools and post-school VE institutions it is to produce individuals with the skills and attributes they require to survive economically and socially.

# References

- ABS (Australian Bureau of Statistics) 1997, *Transition from education to work*, cat. no.62227.0, AGPS, Canberra.
- 2004, *Australian labour market statistics*, cat. no.6105.0, ABS, Canberra.
- ABS & Department of Statistics New Zealand 1993, *Australian and New Zealand Standard Industrial Classification 1993: ANZSIC*, ABS cat. no.1292.0 and New Zealand cat. no.19.005.0092, ABS, Canberra.
- Australian Council of Trade Unions 1987, *Australia reconstructed: ACTU/Trade Development Council mission to Western Europe: A report by the mission members to the ACTU and the TDC*, AGPS, Canberra.
- 1989, *Policies and strategy statements adopted by ACTU congress*, ACTU, Canberra.
- ANTA (Australian National Training Authority) 2002, *Annual report of the Australian vocational education and training system*, volume 3, ANTA, Brisbane.
- 2004, *Moving on .... Report of the High Level Review of Training Packages*, viewed 4 August 2004, <<http://www.anta.gov.au>>.
- Beijing Transport School 2004, 'Study and learn the experience of overseas VE pedagogy, carry out local characteristic development of specialised courses', Beijing secondary VE curriculum reform experience discussion forum.
- Brooks, L 2004, *Australian vocational education statistics: Trends in 'traditional apprentices'*, NCVER, Adelaide.
- Chen Qingyu 2004, 'Develop mould in collaboration and teaching, incubate new plant in cooperation of school and enterprise', *Chinese Vocational and Technical Education*.
- Chen Yongpo 2004, 'The production of half work and half study education and Liu Xiaoqi's half work and half study education thinking', *Hunan Vocational Education*.
- Cihai 1980, Shanghai Dictionary Press, first edition, Shanghai.
- Cully, M & Curtain, R 2001, 'New apprenticeships: An unheralded labour market program', *Australian Bulletin of Labour*, vol.27, no.23, September.
- 2002, *Reasons for new apprenticeship non-completions*, NCVER, Adelaide.
- Commonwealth of Australia 1994, *Working nation*, the white paper on employment and growth, AGPS, Canberra.
- 2001, 'New apprenticeships: An unheralded labour market program', *Australian Bulletin of Labour*, vol.27, no.23.
- 2003, *Bridging the skills divide, report of the Employment and Workplace Relations and Education References Committee of the Senate*, Canberra, viewed 4 August 2004, <[http://www.aph.gov.au/senate/committee/eet\\_ctte/skills/report/report.pdf](http://www.aph.gov.au/senate/committee/eet_ctte/skills/report/report.pdf)>.
- 2004, *Bridging the skills divide*, Senate Inquiry, Employment Education and Training Committee, chapter 6, viewed July 2005, <[http://www.aph.gov.au/senate/committee/eet\\_ctte/completed\\_inquiries/2002-04/skills/report/11ch6.doc](http://www.aph.gov.au/senate/committee/eet_ctte/completed_inquiries/2002-04/skills/report/11ch6.doc)>.
- Department of Education, Training and Employment (South Australia) 1999, *Review of arrangements for on job traineeships in South Australia*, DETE, Adelaide.
- Department of Employment, Education and Training (now the Department of Education, Science and Training) 1991, *Retention and participation in Australian schools 1967–1991*, AGPS, Canberra.
- Department of Employment and Workplace Relations 2004, *National skills shortage list 2004*, viewed 30 July 2004, <<http://www.workplace.gov.au>>.
- 2003, *National skills shortage list 2003*, viewed 30 July 2004, <<http://www.workplace.gov.au>>.
- Department of Employment, Education and Training 1987, *Meeting Australia's skill needs: Fourth report on the occupational share system for skilled migration*, Education and Skills Analysis Branch, Economic Division, AGPS, Canberra.
- 1988, *Meeting Australia's skill needs: Fifth report on the occupational share system for skilled migration*, Education and Skills Analysis Branch, Economic Division, AGPS, Canberra.
- Discussion Forum on Experience in Collaboration of Production and Education in China's Secondary VE, 2004, *Chinese Vocational and Technical Education* (teaching and education research edition) special issue, (July).
- Dong Chengren & Yu Zhijing 2003, 'The government pays the bill, and the schools run the show: The successful experience of the service of VE for migrants', *China VE and Adult Education website*, viewed 16 February 2005, <[http://www.cvae.com.cn/allfile/20030219/mew2\\_036.htm](http://www.cvae.com.cn/allfile/20030219/mew2_036.htm)>.
- Enterprise and Career Education Foundation 2002, *Annual report: Refocusing our objectives*, ECEF, Sydney.

- Forest and Wood Products Industry Training Advisory Board 2004, 'National strategic planning and industry advisory arrangements for VET in the forest and wood products, pulp and paper, furnishing and off-site timber and building products, textile, clothing, footwear, leather and allied manufacturing industry sectors, proposal', viewed 4 August 2004, <<http://www.fafpesc.com.au>>.
- Jiao Zhi Cheng 2002, no.15 file.
- Jung, T, Misko, J, Lee, K, Dawe, S, Hong, S & Lee, K 2004, *Effective measures for school-to-work transition: Lessons from Australia and Korea*, NCVER, Adelaide.
- Kirby, P (chair) 1985, *Report of the Committee of Inquiry into labour market programs*, AGPS, Canberra.
- Li Zhihua, 2004, 'The analysis of reality obstacles and system innovation for cooperation of school and enterprises in collaboration of production and education', *Henan Vocational and Technical Education Institute Journal* (VE edition), no.4.
- Ministerial Council for Education, Employment, Training and Youth Affairs 2003, 'The growth of VET in Schools programs: A national overview', Taskforce on Transition from School, unpublished report, MCEETYA, Canberra.
- Ministry of Education and National Bureau of Labour, State Council 1980, 'Report on reforming the structure of secondary education', guo fa, document no.252.
- Misko, J 1997, *Getting qualified: Dealing with lack of access to workplace training for apprentices and trainees*, NCVER, Adelaide.
- 1998, *School students in workplaces: What are the benefits*, NCVER, Adelaide.
- 2002, *On-the-job traineeships*, report prepared for Western Australian Department of Training, Apprenticeship and Traineeship Branch, Perth.
- Misko, J, Choi, J, Kang, J & Phan, O 2001, *Linkages between vocational education and training providers and industry*, NCVER, Adelaide.
- Misko, J & Slack, E 2001, *Destinations of school leavers who participated in structured workplace placements*, Enterprise and Career Education Foundation, Sydney.
- National Board of Employment, Education and Training 1992, *Post-compulsory education and training: Fitting the need*, AGPS, Canberra.
- NCVER (National Centre for Vocational Education Research) 1999, *Australian vocational education and training, statistics: Survey of employer views on vocational education and training—At a glance*, NCVER, Adelaide.
- 2001a, Student Outcomes Survey, 2001, unpublished data, NCVER, Adelaide.
- 2001b, *Research at a glance, group training apprenticeships and traineeships*, NCVER, Adelaide.
- 2001c, *Australian vocational education and training: Statistics 2001: Survey of employer views on vocational education and training—At a glance*, NCVER, Adelaide.
- 2002, *Issues affecting skill demand and supply in Australia's education and training sector—At a glance*, NCVER, Adelaide.
- 2003, *Student Outcomes Survey*, NCVER, Adelaide.
- 2004a, unpublished data on commencements by group training companies, NCVER, Adelaide.
- 2004b, *Effective measures for school-to-work transition in the vocational education system: Lessons from Australia and Korea*, NCVER, Adelaide.
- 2004c, *Australian vocational education statistics: Training packages*, NCVER, Adelaide.
- Pang Shijun 2003, 'Current situation and measures of VE run by industry enterprises', Masters thesis in Tianjin University.
- 2003, 'The current situation and its countermeasures of vocational education run by trades and enterprises', Masters thesis, Vocational Education Institute of Tianjin University.
- Robinson, C 2001, *Australian apprenticeships: Facts, fiction and future*, NCVER, Adelaide.
- Robinson, C & Misko, J 2003, 'Cross-sector cooperation between TAFE and schools and universities', viewed 4 August 2004, <<http://www.ncver.edu.au>>.
- Schofield, K 1999a, *Independent investigation into the quality of training in Queensland's traineeship system: Final report*, Department of Education, Training and Industrial Relations, Brisbane.
- 1999b, *A risky business: Review of the quality of Tasmania's traineeship system*, Department of Education, Office of Vocational Education and Training, viewed February 2000, <<http://www.ovet.tas.gov.au/review/>>.
- 2000, *Delivering quality: Report of the independent review of the quality of training in Victoria's apprenticeship and traineeship system*, Communications Division, Department of Education, Employment and Training, Melbourne.
- Shen Hengchao 2003, *Studies in the management system of industry organisations and associations: Analysis based on relations between the state and society*, Masters thesis in Qinghua University.
- Smith, E & Wilson, L 2003, *Learning and training in school-based new apprenticeships*, NCVER, Adelaide.
- Smith, L 2000, *Issues impacting on the quality of assessment in vocational education and training in Queensland*, Department of Education, Training and Industrial Relations, Brisbane.
- Sun Baiming 2004, 'Collaborate production with education, develop higher vocational personnel with "zero probational period"', *Vocational Education Forum*, vol.9, no.1.
- Sun Fang 2004, 'Study in development direction of China's industry organisations and associations', PhD thesis in University of Foreign Economy and Trade.

- Sun Lin 2004, 'Collaboration of production and education—the best avenue for VE to achieve employment orientation and provide service to society', *Vocational Education Forum*, vol.4, no.1.
- Wang Xu 'Improving legal system of industry organisations and associations', Masters thesis in Suzhou University.
- Wen Youxin & Yang Jinmei 2000, *The history of vocational education*, Hainan Press, Haikou.
- Wu Qidi 2004, 'The integration of industrial production and education in secondary VE', speech at Ministry of Education National Experience Exchange Forum.
- Yu Zhijing 2004, *The ten major movements and trend of our country's VE reform*, special report of vocational school information work in Changchun, 23 April.
- Zhina VE 1999, Project research group, *Chinese Vocational Education and Employment* (research reference), Beijing, 1 February.
- Zhou Jiqui, 2004, 'Strengthen cooperation of school and enterprise, promote collaboration of production, education and research, improve the service capacity and standards of VE in Jiangsu Province', National discussion forum on collaboration of production and education in secondary VE, February.

## Websites consulted by Chinese researchers

<<http://www.cec.org.cn>>  
 <<http://www.sasac.gov.cn>>  
 <<http://www.china-retailers.com>>  
 <<http://www.chinacoal.org.cn>>  
 <<http://www.mei.gov.cn>>  
 <<http://www.chinaisa.org.cn>>  
 <<http://www.cpcia.org.cn>>  
 <<http://www.clii.com.cn>>  
 <<http://www.ctei.gov.cn>>  
 <<http://www.cbminfo.com>>



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