



**Learning for Jobs
OECD Reviews of Vocational
Education and Training**

Options for China

Małgorzata Kuczera and Simon Field

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June 2010



ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

The OECD is a unique forum where the governments of 31 democracies work together to address the economic, social and environmental challenges of globalisation. The OECD is also at the forefront of efforts to understand and to help governments respond to new developments and concerns, such as corporate governance, the information economy and the challenges of an ageing population. The Organisation provides a setting where governments can compare policy experiences, seek answers to common problems, identify good practice and work to co-ordinate domestic and international policies.

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Summary: Strengths, Challenges and Policy Options

Many strengths are apparent in the Chinese system for vocational education and training in upper secondary schools. The strengths include:

- The establishment of 9 year schooling with almost all children in China now completing lower secondary education.
- A rapidly increasing number of young people now stay on in upper secondary education – now around three quarters of the cohort, and fast increasing numbers of young people in tertiary education. At upper secondary level about half the cohort (as a matter of policy) enter upper secondary vocational schools – with more than 20 million students now in vocational schools.
- A strong and simple model for upper secondary vocational education – involving a range of specialisms, a good percentage of general academic skills underpinning all the programmes, and a commitment to workplace training and close relationships with employers.
- Upper secondary education typically requires fees, but the government has introduced a number of measures, both at national and provincial level to try to overcome financial barriers and ensure that as many students stay on in school – this includes a national scheme to offer a CNY 1500 (Yuan renminbi) per year subsidy to students in VET schools, largely covering their fees, and from 2009 an initiative to make tuition free for upper secondary vocational school students.
- China has strong arrangements to ensure that teachers in vocational schools remain abreast of the requirements of modern industry. Teachers in vocational schools are required to spend one month in industry each year, or two months every two years. In addition, many schools employ a significant number of part-time teachers who also work in industry.

Challenges and policy options

Workplace training

Challenge

Workplace training is actively encouraged by government subsidies and current policy is that each student should spend one year on workplace training during their upper secondary programme. But co-operation with employers is variable. Sometimes when it does occur it involves very close relations with a single local employer, with a risk that the skills acquired may not be transferable. But there are few quality standards for workplace training and few regional, sectoral or national bodies to engage employers and link them to the VET system.

Policy options

- Create a standard expectation of a minimum period of workplace training as an element in upper secondary vocational education and training.
- Consider carefully the use of financial incentives taking into account the limited evidence of useful impact.
- Develop a standard agreement or contract for workplace training to confirm the rights and obligations of trainees and training firms.
- Establish standards for workplace training in consultation with employers, so as to establish a framework that will encourage rather than discourage the provision of workplace training.
- Encourage local associations of training firms to manage and support workplace training offers for vocational schools.
- Develop mechanisms to engage employers at regional and sectoral level to plan provision, agree curricula and support workplace training.

Resources and standards

Challenge

While there are some compensatory arrangements, to a great extent the resources of any school depend on the resources of the province and county/district of which they are part. Given China's rapid but uneven economic development, concentrated in the coastal provinces and urban areas, the effect is to leave schools in some rural areas and poorer provinces under-resourced. Linked to this, is that there are few clear minimum standards for vocational schools in terms of equipment, teachers and so on. While there are some national guidelines, they are inevitably not implemented where resources are not available. One of the main standards is that of 'key national schools', but this appears, by design, to require resources not available to most schools.

Policy options

- Overall expenditure on education, including VET, should be increased, as recommended in previous OECD reviews of China.
- Given big regional discrepancies in available funding on education, extra resources should be allocated to the poorest localities in order to remove financial barriers to participation in VET and to improve its quality. Mechanisms to this end might include:
 - Centrally allocated per capita funding support for upper secondary education, provided by the national government directly to the counties where upper secondary (including VET provision) is most limited, and where quality (measured in terms of teacher indicators such as pupil-staff ratio and teacher qualifications) is weakest.
 - More fundamentally, enhanced fiscal transfers to ensure a stronger funding base for education at provincial and county level.

- Establish minimum quality standards for schools that all regions of China and all schools can reasonably aim for, instead of, or in addition to, the standards of key national schools. Such quality standards might be linked to resource reallocation.

Planning and co-ordination

Challenge

Planning to meet labour market needs is insufficient. Provinces manage some schools directly through the education commission, some through other government bodies such as the agriculture bureau, while many schools are also managed at district and county level. This creates a formidable co-ordination problem. On the demand side, data on labour market demands are often lacking.

Policy options

- Provide a mix of VET programmes that reflect both student preferences and employer needs.
- Develop planning arrangements to manage the mix of skills provision in consultation with employers while recognising the information challenges.
- Use workplace training and employer willingness to provide it as a guide to the appropriate mix of provision.
- Improve co-ordination in the provision of VET across different levels of government and VET providers.

Chapter 1

Introduction

This chapter describes the OECD policy study of vocational education and training in China and places it in the context of the wider OECD review. It summarises the main features of the Chinese VET system and sets out an assessment of its strengths and challenges.

1.1 Vocational education and training in the Chinese context

Over the five years to 2008, the Chinese economy has grown at an unprecedented pace - about 11% per year on average (OECD 2009). In response to the global recession growth has slowed down but has remained robust. In the third quarter of 2009 real GDP growth rose to 8.9% year-on-year (World Bank, 2009).

There has been a dramatic improvement in living conditions. In recent decades income has grown quickly and many people moved from the state of severe deprivation to being moderately well-off. Between 1978 and 2007 disposable income per capita increased six fold (after adjustment for inflation). The China human development index (HDI) increased by nearly 50% from 1978 to 2005. It means that China has moved from the group of countries with low HDI to high HDI countries (UN system in China and Ministry of Foreign Affairs of P.R. of China, 2008).

In education China has attained universal primary and lower secondary enrolment with high transition rate to upper secondary education and steeply increasing participation at tertiary level.

1.2 This report: a study of selected policy issues

This is the report of a study of Chinese system of vocational education and training (VET) system, undertaken by the OECD as part of its Learning for Jobs exercise (see Box 1.1). The OECD agreed with the Chinese authorities to look in particular at developing workplace training, resource and quality issues, and some issues of planning and co-ordination in the VET system. The analysis developed here depends significantly on the initial comparative report of the OECD policy review of vocational education and training (Field *et al.*, 2009), and some of the associated individual country reviews¹. This report also notes some additional challenges to the VET system which could be addressed in further work. This report is a more modest exercise than the full policy reviews in the Learning for Jobs exercise – it covers a restricted set of issues and offers policy options for addressing the challenges identified.

1. Both the initial report and all the published country reviews are available on the website at: www.oecd.org/edu/learningforjobs

Box 1.1 Learning for Jobs, the OECD policy review of vocational education and training

For OECD member countries, a well-skilled workforce is one of the main supports for prosperity and growth. Some skills come from general education, but specific occupational skills are also needed. Typically initial vocational education and training systems have a big part to play in supplying these skills. These systems are now under scrutiny to determine if they can deliver the skills required. Launched in 2007, *Learning for Jobs*, the OECD policy review of vocational education and training, is designed to help countries with this task. The key policy messages are:

To meet labour market needs

- Provide a mix of VET programmes that reflect both student preferences and employer needs, and beyond secondary level, share the costs between government, employers and individual students according to the benefits obtained.
- Engage employers and unions in curriculum development, providing young people with the transferable skills to support occupational mobility, and the specific skills to meet employers' immediate needs.

To sustain the workforce of teachers and trainers

- In VET institutions, promote partnerships with industry; encourage part-time working and promote flexible pathways of recruitment for the workforce.
- Provide appropriate pedagogical preparation for trainers of trainees and apprentices in workplaces.
- Adopt standardised national assessment frameworks.

To promote workplace training

- Ensure there are sufficient incentives to participate in workplace training for both employers and students, and that the training is of good quality, backed by contractual frameworks for apprentices and effective quality assurance.
- Devise effective responses to the current economic crisis, to sustain workplace training, and cope with increased demand for full-time VET.

Develop tools for policy

- Construct effective mechanisms to engage employers and unions in VET policy and provision.
- Collect good data on the labour market outcomes of VET, and the capacity to analyse that data.
- Provide careers guidance accessible to all, informed by knowledge of labour market outcomes.

Box 1.1 Learning for Jobs, the OECD policy review of vocational education and training (continued)

Methods and outcomes

The OECD is conducting individual policy reviews in Australia, Austria, Belgium (Flanders), the Czech Republic, Germany, Hungary, Ireland, Korea, Mexico, Norway, Sweden, Switzerland, the United Kingdom (England and Wales), and the United States (South Carolina and Texas). Short reports on Chile and the Peoples Republic of China are also being published. Canada, Denmark, Finland and the Netherlands also provided voluntary financial contributions.

All reviews and working papers are published on the website. Working papers include reviews of previous literature, PISA data on VET, and a study of the effect of the economic crisis. The initial report (Field *et al.* 2009) of the policy review is available on the OECD website. The final comparative report will be published as a book in Autumn 2010.

For further information, publications and contacts www.oecd.org/edu/learningforjobs

Two members of the Secretariat conducted interviews in three regions of China on 26 October –2 November 2009 to assemble information about the VET system and identify the main policy challenges within the agreed topic areas². This report presents the OECD's analysis of these topics and policy options.

1.3 The structure of the report

This first chapter places this report on policy issues in the context of the OECD policy review of vocational education and training, sets out the structure of the report and describes the main features of China's VET system. Chapter 2 looks at the three selected policy issues. Each policy issue is explored through:

- *The challenge* – the problem which needs resolution.
- *Analysis in support of policy options.*
- *Policy options.*

1.4 A snapshot of vocational education and training in upper secondary schools in China

In China, vocational education and training takes place in four main contexts.

- lower secondary schools (now a very small sector)
- upper secondary vocational schools
- tertiary education
- through adult learning and enterprise training.

This report concentrates primarily on upper secondary schools.

2. Annex A describes the agenda of the visits.

In China, nine years of full-time schooling, covering primary and lower secondary school, are compulsory, and are now nearly universal in application. There are now a declining number of vocational lower secondary schools (with less than 1% of students enrolled); in urban areas, these schools are effectively disappearing, but they continue to have some role in rural areas, providing basic skills in areas like agriculture and handicrafts. One reason for their continued existence is that some parents from peasant families will not send their children to school unless they are learning practical skills.

Following compulsory education around three quarters of the students (74%) go on to upper secondary education. A national exam determines entry - either a vocational or general track, with better results being necessary for the general track. In 2007, 43% of upper secondary students (adults excluded) were enrolled in vocational programmes (China Statistical Yearbook, 2008). The objective of the national government is to have half of the students in the general track, and half in the vocational track. Many parents and students aspire to tertiary education and therefore initially aim for general upper secondary education, where many students might expect to go on to tertiary education.

In the vocational track, students apply for different vocational schools and programmes in their province, and are selected according to their results. They can also apply to enter good vocational schools in other provinces³ – very often in the developed eastern provinces. (Many such internal migrants want to stay in the region in which they studied following graduation, but cannot obtain local *hukou* (the long-established system for granting official residence status) we were told that they nevertheless stay and work – possibly facing some labour market obstacles).

Typically schools are managed by the third tier of government – counties or cities, but other bodies can also be responsible for schools - sometimes the province, sometimes government agencies, not responsible directly for education, such as the agriculture bureau, sometimes different bodies within government at provincial level – for example the transportation commission in Beijing has established a large vocational school covering transport occupations. In Beijing a local reform brought some of the schools owned by diverse bodies - for example the Chemical Commission - under the Education Commission. School funding depends primarily, but not entirely on the resources available to the relevant tier of government, which depends on local taxes and is therefore highly variable.

Fees for upper secondary vocational schools are usual. Estimates vary on the proportion of school costs covered by fees - from 25% upwards. In Shanxi province the fees are CNY 2000 per student – this includes board and lodging and textbooks – recognising that in a rural area upper secondary students need to board. Fees in visited schools in Guizhou province varied from CNY 1200 to CNY 1500. On the top of that boarding students cover the costs of dormitory and canteen - around CNY 200. In well-off areas such as Beijing or Shanghai tuition fees are higher oscillating between CNY 2000 and CNY 4000. We were told that a new scheme is providing a subsidy of CNY 1500 for all VET students in China so that in Guizhou province for example, the students would only have to cover their living expenses. In addition to CNY 1500 subsidy there are systems of subsidies for those in vocational schools, typically locally determined. For example in Beijing there are subsidies according to various criteria of need ranging from a few hundred to a few thousand yuan.

3. Beijing and Shanghai also have the status of provinces.

On completing vocational school, students receive a graduation certificate delivered by the Ministry of Education. Some of them can also obtain a vocational certificate (associated with a particular occupational skill) delivered by the Ministry of Labour and Human Resources upon passing a practical exam. Depending on the school and its level of co-operation with companies, students can also obtain firm specific certificates during their studies, for example a ‘Toyota’ certificate.

The curriculum is divided into three parts – about one third for general academic skills defined nationally by the ministry of education, about one third defined nationally associated with the particular occupation, and finally about one third, also in the occupational field, determined locally according to local needs, sometimes at school level. There are 270 vocational specialities nationally, grouped in thirteen branches as follows:

1. Agriculture and forestation.
2. Resource and environment.
3. Energy.
4. Civil works and hydraulic engineering.
5. Manufacture.
6. Transportation.
7. Information technology.
8. Medicine and health.
9. Business, trade and tourism.
10. Finance and economics.
11. Culture, arts and sports.
12. Social and public affairs.
13. Others.

Many students want to continue from vocational school to tertiary education. In June each year there is a national examination for all students wishing to enter tertiary education, but we were told that there is a limit in the proportion of vocational school graduates permitted to enter tertiary education through this route. But there are other routes into tertiary education so a much higher proportion of the cohort can end up in tertiary education by one route or another. Tertiary education has expanded dramatically in recent years, in 2007 there were nearly 19 million students enrolled in undergraduate and college specialised courses (China Statistical Yearbook, 2008). Around 8 million students are enrolled in tertiary VET (Central Institute for Vocational and Technical Education, Ministry of Education, China, n.d.)

Teachers in the vocational schools are either recruited directly as graduates or from industry. In most cases schools will recruit teachers themselves. While some vocational teachers lack work experience, it is the policy of the national council for every teacher to return to industry regularly - spending two months every two years in industry. Many vocational teachers work part-time in industry part-time in schools – in Shanghai around one third of VET teachers are in this category.

Many of the key relationships between the VET system and employers are locally negotiated. Some schools have extremely close relationships with employers – the visiting OECD team saw one school where particular programmes were linked to the work of some very large companies. The 3rd or sometimes the 4th year of the vocational school then consists of work placements with the companies. (While most vocational schools run 3 year programmes, some are 4 year schools. The extra year allows more academic learning during the whole period, and often more workplace training.) Consideration is being given to institutionalising the 3rd or 4th year as workplace training, and introducing incentives for firms to take students.

At national level, the Ministry of Education sets guidelines for the curriculum – the responsibility for implementation lies with the province, and sometimes the school. While the capacity to implement the curriculum locally allows for such arrangements it also inhibits the engagement at national level of industry in defining key competences for particular occupations. Some particular challenges arise because of the transition from the planned to the market economy. Employer organisations were formerly part of the government but are now independent, but are relatively young organisations – an opportunity is therefore emerging for the VET system to engage with independent employer organisations.

A special 1.5% tax on employers supports adult training, but they are not available to support vocational schools.

1.5 Appreciation: the strengths of the system

The Chinese system for vocational education and training in upper secondary schools has great strengths – it builds on a robust basis of universal basic schooling, and rapid growth in educational aspirations and attainment. The strengths include:

- The establishment of 9 year schooling with almost all children in China now completing lower secondary education.
- A rapidly increasing number of young people now stay on in upper secondary education – now around three quarters of the cohort, and fast increasing numbers of young people in tertiary education. At upper secondary level about half the cohort (as a matter of policy) enter upper secondary vocational schools – with more than 20 million students now in vocational schools.
- A strong and simple model for upper secondary vocational education – involving a range of specialisms, a good percentage of general academic skills underpinning all the programmes, and a commitment to workplace training and close relationships with employers.
- Upper secondary education typically requires fees, but the government has introduced a number of measures, both at national and provincial level to try to overcome financial barriers and ensure that as many students stay on in school – this includes a national scheme to offer a CNY 1500 (Yuan renminbi) per year subsidy to students in VET schools, largely covering their fees, and from 2009 an initiative to make tuition free for upper secondary vocational school students.
- China has strong arrangements to ensure that teachers in vocational schools remain abreast of the requirements of modern industry. Teachers in vocational schools are required to spend one month in industry each year, or two months

every two years. In addition, many schools employ a significant number of part-time teachers who also work in industry.

But there are also some challenges:

- *Working with employers.* While workplace training is actively encouraged by government policy which anticipates that each student should spend one year on workplace training, co-operation with employers is variable. Sometimes when it does occur it involves very close relations with a single local employer, with a risk that the skills acquired may not be transferable. There are few quality standards for workplace training and few regional, sectoral or national bodies to engage employers and link them to the VET system.
- *Resources and standards.* While there are some compensatory arrangements, to a great extent the resources of any school depend on the resources of the province and county/district of which they are part. Given China's rapid but uneven economic development, concentrated in the coastal provinces and urban areas, the effect is to leave schools in some rural areas and poorer provinces under-resourced. Linked to this, there are few clear minimum standards for vocational schools in terms of equipment, teachers and so on. While there are some national guidelines, they are inevitably not implemented where resources are not available. One of the main standards is that of 'key national schools', but this appears, by design, to require resources not available to most schools.
- *Planning and co-ordination.* Planning to meet labour market needs is insufficient. Provinces manage some schools directly through the education commission, some through other government bodies such as the agriculture bureau, while many schools are also managed at district and county level. This creates a formidable co-ordination problem. On the demand side, data on labour market demands are often lacking.

Chapter 2

Policy Issues

Vocational education and training in China, like general education, has developed at an impressive pace, so that around one third of young people in China now enter vocational upper secondary schools. Rapid growth has also brought some challenges - this chapter looks at three selected policy issues, and outlines policy options.

First, it notes the importance of good quality workplace training in VET programmes and underlines the need for workplace training needs to be supported by effective relationships with employers. It discusses possible incentives for employers to provide training. Second, it points out that resource challenges may limit quality and participation in VET. It proposes increases in spending on education, targeted allocation of resources and quality standards for all vocational schools. Third, it notes that student preferences and employer needs are both important in determining VET provision. It proposes planning arrangements to manage the mix of skills provision in consultation with employers and use workplace training as an indication of employer needs. It also highlights the need for better coordination in the provision of VET across different levels of government and VET providers.

2.1 Developing workplace training

The challenge

Quantity

Workplace training is widely recognised, in China as elsewhere, as a very important component of vocational education and training, and it is encouraged as an element in upper secondary vocational programmes. In some upper secondary vocational schools in China it is relatively extensive - with up to one year of workplace training in the final third or fourth year of programmes. The government is keen to expand workplace training and is looking at a range of different measures to this end. But the extent of workplace training depends heavily on locally negotiated partnerships between schools and employers and the visiting OECD team were told that many schools provide few opportunities for such training. So some school programmes offer an inadequate quantity of workplace training.

Quality

Although in 2007 the Ministries of Education and Finance jointly issued a regulation on vocational school students internship, relatively few regulations governing workplace training appear to be routinely enforced. This creates a risk that some workplace training may be of low quality, or focus on too narrow a range of skills. Firms are always interested in the immediate productive contributions of apprentices but sometimes less concerned with providing for a good learning experience (Cornford and Gunn, 1998; Kilpatrick, Hamilton and Falk, 2001; Gibb, 1999). Even if a firm has an interest in providing good training, there may still be a difference between the firm's interest and those of students: firms tend to have a preference for firm and occupation-specific skills, while students also need skills that are transferable to other firms and possibly other occupations (Smits, 2006). Research from Australia suggests that small firms are also unlikely to have dedicated training staff (Hawke, 1998), the training offered tends to be unplanned (Vallence, 1997), informal and firm-specific (Seagraves and Osborne, 1997). While workplace training needs to yield benefits to employers to encourage them to offer sufficient training places, it should not be so firm-specific that it inhibits future professional mobility.

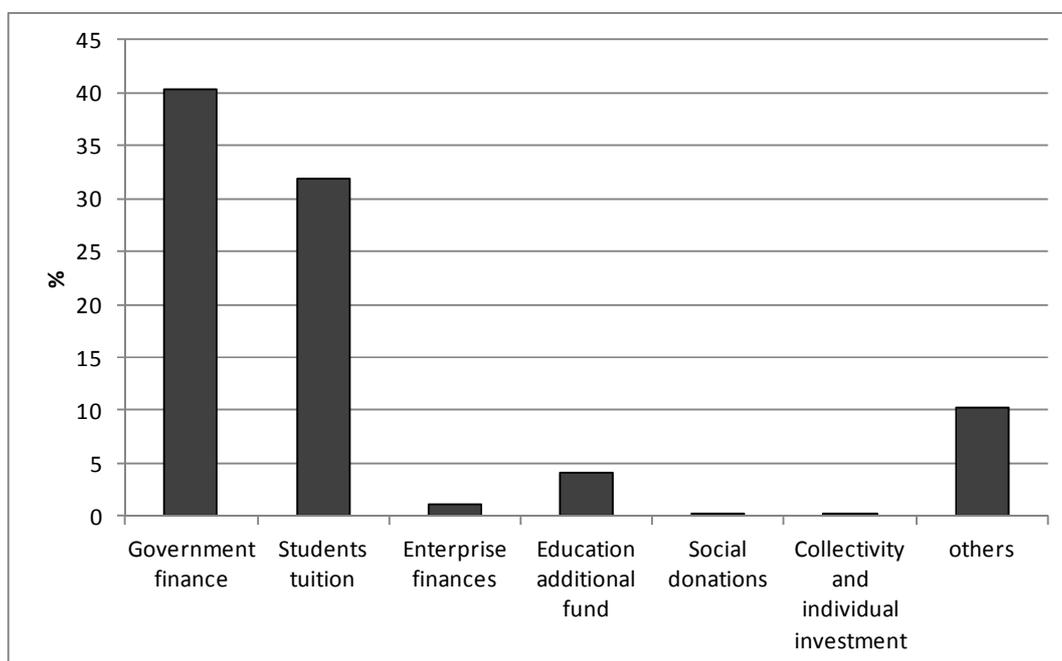
Funding

The distribution of funding responsibilities represent another challenge. VET (regardless of the level) aims to provide skills that can be immediately applied on the labour market in the targeted occupation. These skills benefit employers directly. The precise distribution of benefits will depend on the mix of skills being learnt – for example skills specific to an industrial sector may yield proportionately higher benefits to the whole industrial sector and rather lower benefits to the employee themselves. The distribution of benefits should ideally be reflected in the distribution of funding responsibilities in order to ensure the optimal skills provision. Consequently, if training is in company related skills, companies should contribute to the costs. One recent initiative,

announced in 2007 by the MOE and the state administrator of taxes, allows tax deductions for employers providing workplace training.

In China, part of workplace training in upper secondary VET can be arranged to fit company needs, for example students are trained in the marketing strategy of a specific firm. For a company this form of firm-specific training is a relatively cheap way of getting skilled employees given that the cost of upper secondary VET is mainly covered through government contributions and student fees (see Figure 2.1 below). The risk of this arrangement is that firm specific training in upper secondary VET provided at a low cost for a company may simply displace training that a company would otherwise offer to their new recruits. As a result, the total amount of training will not increase.

Figure 2.1 Source of VET funding



Source: Central Institute for Vocational and Technical Education, Ministry of Education, China (n.d.) “Reform and Development of Vocational and Technical Education in P. R. China”, PowerPoint presentation.

Analysis in support of policy options

This section argues that enhanced workplace training would be desirable for China and therefore supports the government’s objective of promoting workplace training in vocational upper secondary schools. It points to the need to support workplace training with quality standards, and to some risks of poor quality workplace training. It points out that workplace training needs to be supported by effective relationships with employers and discusses possible incentives for employers to provide training.

Workplace training has major advantages

Workplace training, alongside other forms of vocational learning has compelling attractions. They include:

- *A strong learning environment.* Workplaces are a good context to acquire both hard and soft skills. The acquisition of hard skills sometimes requires practical training on expensive equipment. Rapidly changing technologies mean that equipment quickly becomes obsolete, so that VET institutions are often unable to afford modern equipment. Workplace training will therefore often be more cost-effective, since it makes use of equipment already available in firms. Firms also employ the people who understand how to use the latest equipment and can explain the associated techniques. While a trainee electrician can learn how to wire a house in a VET institution with the relevant electrical equipment, that electrician will normally need a work placement to find out how to deal with a complaining client, or work effectively alongside a builder and a heating engineer. A study of sales assistants in Denmark (Aarkrog, 2005) found that soft skills were best acquired on the job. A study from Finland (Lasonen, 2005) found that workplace training taught students entrepreneurship, promoted maturity and supported the development of practical soft skills. Other research has shown that it is easier to develop professional skills in work-based training than transferring into practice the theoretical knowledge learned at school (Aarkrog, 2005; Woerkom, Nijhof and Nieuwenhuis, 2002).
- *A two-way exchange of information to improve recruitment.* Workplace training also provides critical information to students about the line of work they might or might not wish to pursue and about at least one potential employer. This helps to facilitate a smooth transition from school to work. In the workplace, employers learn about the performance of trainees and apprentices as potential recruits and equip them with skills suited to the job (Autor, 2001; Clark, 2001). Since other potential employers cannot readily observe these characteristics, an employer taking trainees is in a position to recruit the best from among them. (Acemoglu and Pischke, 1998; 1999a; Leuven, 2005). This is the recruitment benefit to employers. This benefit depends on some labour market features (Acemoglu and Pischke, 1999b). In particular, where wages are very flexible and job security limited, it is possible for employers to take on recruits at low wages and then, once employee performance becomes clearer, reward the most productive and lay off weaker ones. This means that it is not vital to establish productivity in advance of recruitment, and the recruitment benefit of taking trainees is less. Currently, the labour market in China is in transition. An increasing proportion of the labour force work in private companies. New labour laws in 2008 sought to improve employer protection – but there remain problems of enforcement. Minimum wages set locally have not kept up with average wages, but they have been less than fully enforced.
- *Productive contribution.* Trainees undertake useful work generating a productive benefit for the employer (Schwepker et al., 2003, Mühlemann et al., 2007). Their contribution typically increases with experience and depends also on how their work is organised. In Switzerland, in two-thirds of cases examined in one study, the productive contributions of apprentices were more than or at least equal to the costs of training. In Germany, the productive contribution is much less (Beicht, Walden and Herget, 2004) because Swiss apprentices spend more time doing

productive work at the host company than German apprentices (Dionisius *et al.*, 2008).

- *Automatically adjusts provision to labour market needs.* Employer willingness to offer workplace training places is an indicator of their support for the associated vocational programme. Employers will be particularly keen to offer such placements in contexts where they have labour shortages –because the trainees contribute to production and because they may be future recruits. Workplace training is therefore automatically linked to labour market needs.

Workplace training normally needs to be supplemented by the use of other training locations, since vocational theory (like a butcher’s knowledge of anatomy) is often best learned in a classroom setting. Some practical skills can be more effectively learnt off the job, where simulations can replace expensive or dangerous equipment, or where a slower pace can allow students to develop their skills (Robertson *et al.*, 2000) or where economies of scale make training workshops more effective than the workplace.

Given all the compelling advantages of workplace training, there is an argument for establishing a policy norm for the minimum period of workplace training in an upper secondary vocational programme. Even if such a norm allowed for exceptions – for example where local industry is very weak, it would still help to focus attention on the need for such training. Published statistics to demonstrate how many pupils in each school fail to receive such a minimum would increase the pressure on every school to deliver the minimum. At the same time, the introduction of such a minimum requirement in China would need to be accompanied by some quality requirements – to ensure that the training delivers desired outcomes.

In practice, many measures introduced by countries to support workplace training are aimed at increasing both the quantity and quality of training – all of them might be considered by China. Such measures include:

- Financial incentives for employers to provide workplace training.
- The introduction of a legal framework or contract to cover workplace training.
- Quality standards for workplace training.
- Local training associations of firms to support workplace training.
- Broader groupings of firms at regional or national level to develop workplace training and guide the vocational system more broadly.

These options are considered in turn.

Incentives for employers to provide workplace training

The benefits of workplace training fall widely, to employers, to students, and to employers and society at large. Following the same logic, OECD governments use a mix of direct subsidies, tax breaks and levy arrangements to boost the provision of workplace training (see Table 2.1). As mentioned earlier, China offers tax breaks to employers providing workplace training opportunities. The use of public or private resources to support employers who train is usually coupled with clear rules on the quality of training, so as to ensure that the training benefits students and society in the long run, leading to the development of transferable skills and is not defined narrowly to suit specific company needs.

Table 2.1 How governments and employers support workplace training

	Public funding		Firms' collective contribution (e.g. training levy)	Employers contribution to VET		
	Direct subsidy	Tax deduction		Training equipment	Salaries of trainers	Travel expenses of a trainee
Australia	Yes	Yes	No	Yes	Yes	Yes
Austria	Yes	Yes	In some sectors	Yes	Yes	Yes
Denmark	No	No	Yes	Yes	Yes	No
Finland	Yes	No	No	-	-	-
France	No	Yes	Yes	Yes	Yes	No
Hungary	Yes	No	Yes	Yes	Yes	Yes
Norway	Yes	No	No	Yes	Yes	Yes
Netherlands	No	Yes	-	Yes	Yes	Yes
Switzerland	No	Yes	In some sectors	Yes	Yes	Yes

Direct subsidy: A direct cash transfer from public sources to enterprises providing practical vocational training (e.g. state contribution to the training fund, grants).

Tax deduction includes:

- Payroll tax deduction/exemption: Deduction/exemption on an amount that an employer withholds and/or pays on behalf of their employees based on the wage or salary of the employee. Governments use revenues from payroll taxes to fund such programs as social security, health care, unemployment compensation, worker's compensation.

- Profit tax deduction: Amounts deducted from a taxable income.

Source: Kuczera, M. (forthcoming), *The OECD International Survey of VET Systems*, OECD, Paris.

One option for China would be, in addition to the existing tax break, to boost workplace training in vocational school programmes through an employer subsidy. But there are grounds for using such an approach cautiously. A flat-rate subsidy to employers per workplace training place offered has two potential weaknesses. First, many of the places attracting the subsidy would be offered even without the subsidy. So the net effect of the subsidy on the overall training effort may be modest. Second, subsidised firms may reduce other types of training that are less generously subsidised. International evidence on the effectiveness of subsidies, as an incentive for a firm to train, is mixed. A Danish study (Westergaard-Nielsen and Rasmussen, 1999) found that subsidies had a positive effect in some sectors (and even there the effect was relatively minor), while they had no effect in others. An analysis of companies in Switzerland (Muehleemann *et al.*, 2007) found that the net costs of training have a significant impact on whether a company offers apprenticeships or not, but they do not influence the number of apprentices, once the company decided to train, so subsidies given to firms that already train apprentices would not have any effect. Some countries employ training levies to boost the amount of training offered by companies – typically using them to support the training of existing employees, but also sometimes trainees and apprentices. Training levies share some weaknesses with subsidies for training provision – in particular there is a risk that levies subsidise training that would have been provided anyway (Dar, Canagarajah and Murphy, 2003). As set out in the OECD policy review of VET (Field *et al.*, 2009), evidence on the effectiveness of levies is mixed.

Contracts for workplace trainees

An apprenticeship or traineeship contract, setting out the rights and obligations of both trainees and receiving firms can be a tool not only to enhance the quality of workplace training, but also to encourage the involvement both of employers and students. Ryan (2000), in a study of European countries, identified the existence of a legal framework for apprenticeships, as one important condition for the successful implementation of workplace training. Box 2.1 provides further country examples.

Box 2.1 Contracts for workplace training

In **Australia**, the Apprenticeship/Traineeship Training Contract is between employer and apprentice. A representative of the Australian Apprenticeships Centre is required to be present at the signature of the contract, and advises both parties on their rights and responsibilities as outlined by the National Code of Good Practice; ensures that the apprenticeship is appropriate to both parties and that they have received relevant information. The training contract outlines the employer's obligation to employ and train the apprentice; pay wages and ensure that the apprentice receives adequate facilities and supervision. Employers need to submit a training plan, which must be endorsed by the concerned training provider (VET institution). The contract stipulates a probation period, during which either party can terminate the agreement. Upon completion of the probation period, only by mutual agreement is it possible to transfer, suspend, cancel or vary the contract.

Source: www.training.com.au/portal/site/public/menuitem.7e75abb80a4e4690f9fa5a1017a62dbc/

In **Switzerland**, an apprenticeship contract is signed by the employer, apprentice and the student's legal guardian. Legally binding, these contracts must remain in effect for the entire duration of the VET programme. In almost every respect, apprenticeship contracts are equivalent to work contracts (based on Articles 344 to 364a of the Swiss Code of Obligations). The only difference is that apprenticeship contracts include a clause whereby the host company agrees to provide the student with practical training. The apprenticeship contract also sets out the salary conditions for the entire period of training.

Source: (Swiss) Federal Office for Professional Education and Technology (2008).

In **Austria**, a training contract, is between the employer and the student. The apprentice receives health, accident, pension and unemployment insurance. The training relationship is regulated by the labour and social law, as well as particular employee protection regulations for young people. Apprentices are entitled to a salary (*Lehrlingsentschädigung*), determined through collective negotiation and which varies among occupations.

Source: www.bmukk.gv.at/schulen/bw/bbs/berufsschulen.xml#toc3-id4

Introducing quality standards in workplace training

As argued here, workplace training is valuable in general, but it sometimes has problems. Sometimes workplace training can be too narrow, sometimes inadequately taught, and sometimes just provides cheap labour in unskilled jobs – without training benefits. At present quality assurance in workplace training is relatively weak in China. So the risk is that a general expansion in training might increase these problems if the expansion is not accompanied by attention to quality standards. Regulations on the content of workplace training and quality standards have been identified as essential to high quality learning (Smits, 2006; Dionisius *et al.*, 2008). Workplace training standards

are a set of rules or guidelines setting out what is expected of an employer providing placements. Such standards should ensure:

- Clear learning targets, complementing off-the-job schooling objectives.
- That those who look after trainees are adequately prepared for that task. The quality of the relationship between VET students and other employees in the company not involved directly in training is also important (Robertson *et al.*, 2000). Such informal training is especially important in small and medium enterprises (Harris, Simons and Bone, 2000).
- That trainees undertake tasks with learning outcomes (rather than unskilled work).

These considerations argue some measures of for quality control in China, but clearly this but they should not be so demanding as to inhibit employer participation. Quality control may therefore need to take the form of supportive measures for employers, rather than something which could be seen as a bureaucratic obstacle to firms wishing to undertake workplace training. The *QualiCarte* project in Switzerland provides an example of a tool that supports employers in improving their training (see Hoeckel, Field and Grubb, 2009).

Local associations of training firms to support workplace training

In some countries special bodies facilitate employer engagement in the provision of workplace training. They typically serve to improve the match between the needs of employers and students looking for workplace training. They also take care of the administrative duties, removing a considerable burden from employers (see examples in Box 2.2).

Box 2.2 External bodies involved in workplace training for VET students

Australia: Group training organisations (GTOs) are not-for-profit organizations supported by public authorities, with some charges to host employers. The role of GTOs is to employ apprentices and hire them out to host employers. They sometimes focus on a particular industry or region. The tasks performed by GTOs include: selecting apprentices to suit the needs of employers; arranging and monitoring training both on and off the job; taking care of the administrative duties involved; and ensuring that apprentices receive a broad range of training experience – sometimes by rotating them to different firms.

For research papers on GTOs see www.ncver.edu.au/publications/bytheme.html.

Norway: training offices (TO) (*opplæringskontor*) are owned by companies and usually relate to specific trades. They aim to identify possible new training companies and establish new apprenticeship places, supervise companies with apprentices, and train staff involved in the tutoring of apprentices. Many TOs organise the theoretical part of the apprentices' training. They often sign the apprenticeship contracts on behalf of smaller training enterprises, thereby becoming accountable for completion of the training and its results

Source: Norwegian Directorate for Education and Training (2008).

Broader structures for employer engagement

The development of workplace training requires involvement by employers. Both employer engagement and workplace training provision are very high in countries like Germany, Switzerland or Austria and conversely in Sweden both engagement and provision are weak. Employer engagement in VET is very variable across OECD countries both in terms of the institutional arrangements and the tasks and actions carried out by employers. It can also vary in scope and involve merely an advisory or consultative role – of varying weight – or may be an actual decision-making role. Employers groups can work together to plan curricula, identify areas of future skills need, or current skills shortage, and negotiate frameworks for workplace training. In China the China Enterprise Confederation and China Enterprise Directors Association exists at sectoral level to represent employers and lists the development of human resources as one of its objectives – but the issue does not appear to play a major role in their work. The OECD team was told that co-operation between schools, local educational authorities and companies through VET co-operation groups is encouraged but the effectiveness of these bodies is not clear.

One option for China would be to systematically develop employer groupings at different levels (national, sectoral and provincial) to engage with the vocational training system, either by building on the existing structure or by setting up new bodies. Such groupings – say at the level of a province – might serve several purposes – identifying emerging skill requirements in industry and encouraging an appropriate response in the VET system, helping to develop curricula relevant to employer needs, and arranging relevant workplace training provision in their areas of interest. Employers would have incentives to engage in such groupings because of the influence they would gain on skills provision, while at the same time they would become fora in which employers might naturally be encouraged to provide workplace training places.

In different OECD countries, bodies for employer engagement and representation in VET can be found at various levels, depending on how policy making is structured in a given country. They can be created at national level, according to industrial sectors, regionally structured or at the level of the individual institution (*e.g.* employer representation in school boards). While involvement at national level allows for the strategic steering of VET policies, employer engagement at school level can help to improve the concrete links between the workplace and schools, and encourage the exchange of teaching and training personnel. Bodies organised by industrial sector are particularly helpful in defining the specific competences associated with qualifications. (see Box 2.3 for country examples).

Box 2.3 Examples of institutional frameworks for employer involvement

National level:

The **UK Commission for Employment and Skills, UKCES** is an employer-led body that advises ministers on strategy, targets and policies, monitors the VET system and the Sector Skills Councils which are licensed by it. Launched in April 2008 following recommendations on a major report assessing UK's skills needs (the 2006 Leitch review of skills), UKCES assesses the UK's progress towards the skills targets set by the report. It is primarily composed of business leaders, but also has members drawn from the trade unions and local government.

The **Danish Advisory Council for Initial Vocational Education and Training** (*Rådet for de Grundlæggende Erhvervsrettede Uddannelser – REU*) comprises 25 members from the social partners, alongside school leader and teacher associations and members appointed by the Ministry of Education. It advises the Ministry of Education on all matters concerning the VET system monitors programmes and labour market trends and recommends any changes in VET qualifications.

The **Swiss partnership arrangements** between the Confederation, cantons and the social partners are established by law. The Confederation is responsible for strategic planning and development, the cantons for implementation and supervision and the social partners the definition of course content and provision of apprenticeships in host companies) but all major decision are discussed and taken jointly and all three partners are represented at national and cantonal level.

Sectoral level:

The **Australian Industry Skills Councils, (ISCs)** are privately registered companies run by industry-based boards of directors, mainly funded by the Australian Government. 11 national ISCs cover the skills needs of most of Australian industry. Their tasks include provision of industry intelligence and advice to Skills Australia (an independent body providing advice to the government on current and future skills needs), government and enterprises on workforce development and skills needs; actively supporting the development, implementation and continuous improvement of training and workforce development products and services, including training packages; provision of independent skills and training advice to enterprises, including matching identified training needs with appropriate training solutions; and working with enterprises, employment service providers, training providers and government to allocate training places.

The **UK Sector Skills Councils, (SSCs)** are employer-led bodies that set training strategies for particular sectors of the economy. 25 licensed SSCs cover roughly 85% of the UK's workforce. SSCs are charged with determining the skills offer for their vocational area and have a lead role in determining the qualifications which deliver skills and are eligible for public funding.

Regional level:

Regional VET Centres in the Netherlands (*Regionaal Opleidingscentrum, ROC*), have representatives of (regional level) social partners in their supervisory board. ROCs supply all the vocational training schemes financed by the government at secondary level and provide adult education for a region. There are 46 ROCs in the Netherlands.

Developing workplace training: policy options

- Create a standard expectation of a minimum period of workplace training as an element in upper secondary vocational education and training.
- Consider carefully the use of financial incentives taking into account the limited evidence of useful impact.
- Develop a standard agreement or contract for workplace training to confirm the rights and obligations of trainees and training firms.
- Establish standards for workplace training in consultation with employers, so as to establish a framework that will encourage rather than discourage the provision of workplace training.
- Encourage local associations of training firms to manage and support workplace training offers for vocational schools.
- Develop mechanisms to engage employers at regional and sectoral level to plan provision, agree curricula and support workplace training.

2.2 Resources and quality

The challenge

To a great extent, the resource challenges for vocational schools reflect those bearing on Chinese education as a whole. This section looks at these challenges and highlights their impact on vocational schools.

Too little investment in human capital

Overall government investment in human capital, including investment at central and local level, is relatively low in comparison to resources allocated to capital spending (e.g. infrastructure) and public administration (OECD 2006). In 2006 operating expenses⁴ on education stood at 2.3% of GDP and 12% of total government expenditure. Other on-budget as well as extra-budgetary expenses account for around one fourth of the total education expenditure. Overall, expenditure on education in China was estimated to be around 3% of GDP (OECD 2006), compared with 4.9% of GDP in OECD countries on average, with Japan allocating 3.3% (one of the lowest levels among the OECD countries) and Korea 4.5% of GDP to educational institutions (OECD 2009a). In other Asian countries educational expenditure was 3.6% of GDP in Indonesia, 4.3% in Thailand and 5.9% in Malaysia in the same year (UNESCO, 2008). (Definitional and year differences bear on the comparability of these figures).

4. Operating expenses of the departments of education: They refer to the expenses appropriated from the government budget for the expenditure on salaries and operational expenditure. They include mainly wages, extra wages, welfare funds, pension for retirees, stipend, expenses for official business, expenses for equipment purchases, expenses for repairs, business expenses and subsidies to the units which are unable to support their expenditure by their own earnings. (China Statistical Yearbook 2007, www.stats.gov.cn/tjsj/ndsj/2007/indexeh.htm)

Inequality in funding

The funding of education is primarily the responsibility of local governments (at sub-provincial level) – which provide around 90% of education funding (OECD 2006). Richer provinces and counties with a stronger local tax base are able to spend substantially more on education implying that schools in poor localities are more likely to be under-funded (Gang Guo 2006). Localities often have to rely on their own resources to implement policies and reach targets set up at the central level (*e.g.* the abolition of fees in compulsory school, and subsidised fees for upper secondary education). This creates additional pressures on their budgets, especially in poor regions (OECD 2006). Revenue shortfalls may push localities to search for additional resources from individuals or enterprises; despite the formal abolition of fees in compulsory education some illegal charging of fees for schooling continued (OECD 2009b). Given that poor localities are more likely to need to impose educational charges on families than well resourced localities, these practices may hit the poorest communities hardest.

At regional level, Shanghai (the highest spending region) invests around eight times more in the education and training of a student⁵ than provinces with the lowest per student expenditure such as Henan and Anhui. Conversely, the share of the regional budget devoted to education is much higher in Henan (20%) and Anhui (17%) than in Shanghai (13%) (China Statistical Yearbook, 2008). OECD (2009b) estimates that China would need to increase spending on education in the West by 0.6% of national GDP to equalise per pupil spending in the West with that in Coastal areas. In comparison with other countries such regional discrepancies in education funding are very large. For example in the US, a country which also has a decentralised education system and funding responsibilities divided across different levels of governance, the difference between the highest and the lowest per student expenditure⁶ at state level (parallel to provincial level in China) is not more than three times (NCES, 2007).

Disparities in per capita spending are even larger at the county than at the provincial level. Across China as a whole, most of the inequality across counties can be explained by within-province differences in spending (OECD 2006). The same pattern is likely to apply to expenditure on VET. Provinces have considerable discretion as to whether and how to share their resources with sub-provincial levels (OECD 2006), which might contribute to discrepancies in education funding at county/city level.

Quality and key national schools

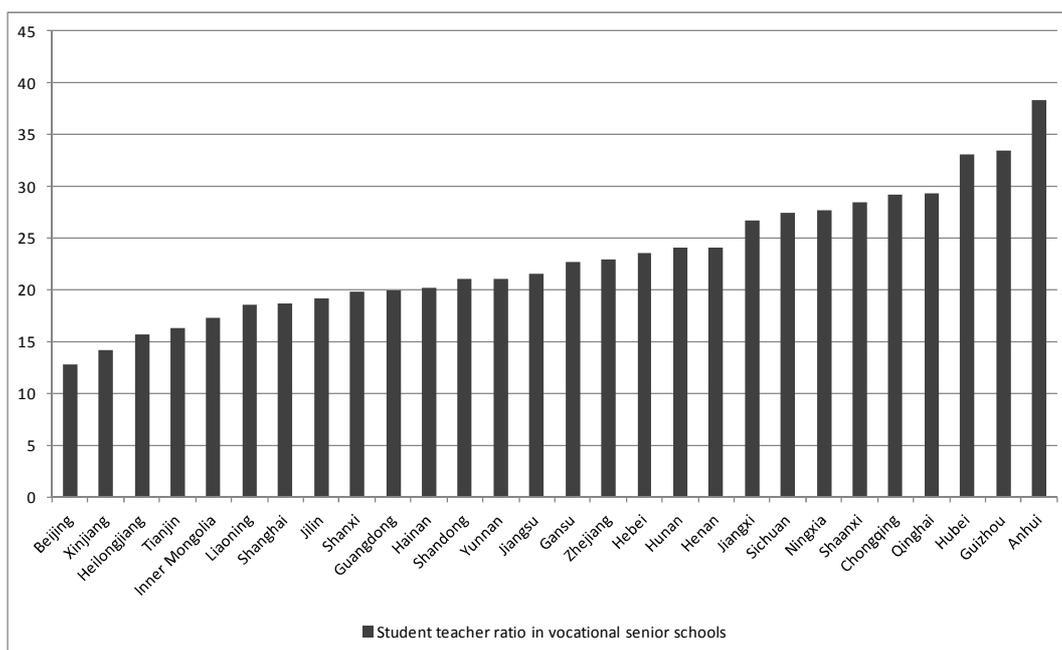
Resource variations may result in variation in the quality of VET in different schools. This is illustrated by differences across regions in the teacher-student ratio and availability of qualified teachers. Figure 2.2 shows that the teacher-student ratio in secondary VET ranges from 13 students per teacher in Beijing to 38 in Anhui. Better-off regions, with higher per student spending tend to have lower teacher student ratios⁷, meaning that poor areas may only afford lower-quality schools. Wand Dewen (2003)

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5. Per student expenditure was estimated as a quotient of the education expenditure to the total number of student enrolled in primary, junior and secondary regular schools, junior and secondary VET, and in undergraduate or specialized courses in institutions of higher education, by region (China Statistical Yearbook, 2008).
 6. Includes public elementary and secondary education (2007 year of reference).
 7. Correlation coefficient between per student spending and student teacher student ratio is -0.49.

confirms that the most developed regions with the highest income such as urban areas in the East have a higher rate of qualified teachers in junior secondary schools than poor regions, (mainly rural areas in the West and in the centre).

Chinese teachers of vocational subjects are required to pursue an in-service training to obtain real work experience in the occupation they are teaching, but the scale of teacher participation in the scheme depends on available funds and training opportunities with industries located in the area. Both elements tend to privilege VET teacher training in developed and high income regions.

Figure 2.2 Student-teacher ratio in vocational senior secondary school, by region, 2007



Source: China Statistical Yearbook (2008), www.stats.gov.cn/tjsj/ndsj/2008/indexeh.htm

Analysis in support of policy options

Balanced investment in human and physical capital contributes to economic growth

New machines and infrastructure will not increase productivity unless there are people who know how to operate and maintain them. Technologies change fast and skills need to follow these changes. Since capital and skills are complementary, an optimal investment strategy will balance physical and human capital (Heckman, 2002). The scale of physical investment in China means that highly skilled workers that can adapt quickly to new requirements are more in demand now than ever. Wei Chi (2008) examined the impact of investment in fixed assets and stock of human capital (measured with workers educational attainment) on economic development of in different parts of China). Economic growth and regional economic inequalities are driven by fixed capital investment. But a big part of the difference in physical capital accumulation can be

explained by human capital availability - regions with more workers with secondary and tertiary education attracted more investment in physical assets.

Development plans for the western regions also emphasize physical rather than human capital development. Under the Western Development Plan for 2001-2005 1.4% of total GDP was invested, but public expenditure on education rose in the West by only 0.05% during the same period. Recent projects announced in 2008 targeting Western provinces also give priority to physical investment facilitating transportation of raw materials to the East over investment in human capital (OECD 2009a). In line with these findings OECD (2009b) estimates that recent large investments mainly in fixed assets in Western China has generated limited economic benefits because the Western provinces cannot respond to a soaring demand for goods, services and skills yielded by the flow of investment. Much of the direct content of investment projects has had to be imported from the rest of the country.

Better skills in underdeveloped regions would allow those regions to benefit more fully from the government investment in physical assets, attract more private investment and stimulate economic growth. Eventually it would also raise returns to education in poorer areas as currently education yields a greater return for urban than rural households (OECD 2009b). It would also reduce the incentives for internal migration, moderating the social and infrastructure pressures arising.

This point is a general one, but it applies equally to vocational upper secondary schools as well as to basic schooling. Stronger vocational skills in the poorer regions may of course lead to migration so that the skilled young people can reap the benefits of their skills, but equally the availability of a better-skilled labour force in the poorer parts of China should encourage employers to launch and grow businesses in those regions.

Targeted funding improves access and quality of education

Evidence from China shows that there is a clear link between education and income level, consistent with international findings (Luo and Zhu, 2008). Those with more education earn more on average. Their income will also grow faster if higher educational attainment is compounded with high initial income. Education, as the most important factor explaining differences in family income between rural and urban areas, is a powerful tool that can either increase or decrease existing inequalities (OECD 2009b, Luo and Zhu, 2008).

Currently, education attainment is higher in urban than in rural areas (OECD 2009b). Also, the transition rate from junior to senior secondary schools and completion from secondary school is lower in disadvantaged areas than in the high income regions. While nationally about 80% of the cohort entered upper secondary education in 2007 (UNDEP 2008), the team was told that in municipalities like Beijing and Shanghai it is nearly universal.

Big variations in education funding (including VET) contribute both to inequalities of access to education and to variations in its quality, with better off localities providing more accessible and better quality education. Poverty affects participation in schooling - poor children in poor localities are more likely to drop out (Brown and Park, 2001). This can be related to the lack of available funds to cover expenses on education such as tuition fees, unofficial fees imposed by the locality that cannot meet expenditures, other costs such as cost of canteen or dormitory and the opportunity costs of a child attending the school. Low quality of school infrastructure and teaching might create serious

obstacles in provision of education and training. In one Western province the team was told that shortfalls of resources in some VET schools run by counties were such that schools were not able to secure basic learning and living conditions for students (many secondary vocational schools being boarding schools). Poor quality of schooling was said to discourage students from going to school and push them to drop out. Some schools would lose 20% of their students because of poor quality education and training.

In secondary VET students pay tuition fees. To increase participation of the poorest students in secondary VET a number of initiatives have been launched. Since 2006 around CNY 40 billion has been spent on this purpose, with more than half financed at local level. There is also a plan to provide all poor VET students in rural and urban areas with CNY 1500 every year during first two years of their VET secondary studies (Central Institute for Vocational and Technical Education, Ministry of Education, China, n.d.) and since 2009, a policy, which has yet to be fully implemented, to provide upper secondary vocational tuition free of charge. The effectiveness of these initiatives depend on whether the aid is well targeted and reaches all students in need. The burden of financial support to VET students is shared by central and local level. Given budgetary constraints in poor localities the central government might consider taking “more responsibility for providing financial support to poor students in poor localities.

The identification of deprived localities for financial support would improve the quality of all education including VET. Evidence from China makes it clear that targeted help works. Between 2000 and 2006 the central government devoted funds equivalent to 0.1% of GDP to the poorest villages for comprehensive help. During this period the income of identified villages rose 2% faster than incomes in all villages (OECD 2009b).

Improving quality at school level

Two key overlapping factors associated with school quality are first, whether the school is a ‘key national school’ and second, whether schools are administered by the province or by the county/district.

‘Key national schools’ meet certain centrally determined standards such as the level of equipment available, the size of the school in terms of teachers and students, whether teachers are qualified and how well the school is administered, and whether demand from students for places in these schools is high. In Shanghai, more than half of the schools are in this category, but only around one quarter in Shanxi province, and only 10% in Guizhou. Key national schools can charge higher fees and these are retained by the school. Thus, in Shanghai for example, the fee for a key national school is CNY 4000 and CNY 2000 for other schools. Key national schools are also eligible for national grants that may cover the purchase of expensive and up-to-date equipment. Key national schools are therefore partly defined in terms of their resources, and being so-defined, attract further resources.

Key national school designation is associated with the issue of school ownership by the county or province. The school owner is responsible for covering the cost of education and training provision, including teacher salaries and cost of school infrastructure. Sub-provincial governments can apply for financial support from the province if they run short of resources but whether the aid is allocated and its amount depend on the provincial economic situation. In Guizhou province for example, 27 schools, around 10% of the total are directly managed and financed by the province. In

Beijing, one half of the schools are directly managed by the city of Beijing (which has the status of a province) and half by the district (the urban equivalent of a county).

Schools directly managed by the province tend to take the province as their catchment area, with most students boarding. They are often larger schools with some thousands of students, and to specialise in one area – like construction, or tourism. These provincial schools therefore often operate as a kind of competitor to local provision at county level – we were told that they are often of better quality, because they specialise, and perhaps also because their funding base in the province tends to be stronger. Often they will be sufficiently well-equipped to meet the criteria for key national schools. In Guizhou province, around two thirds of the national key schools in the province are directly run by the province. (Conversely in Beijing, schools run by the district are no less likely to be key national schools than schools run by the city. The Beijing authorities told us that they also support district schools). The biggest resource pressures clearly fall on the rural schools, particularly in the Western provinces. The team was informed that in one of the Western provinces, county-funded schools face severe resource constraints - after paying teacher salaries they have no money left to cover other expenses such as teaching and training facilities, repairing school buildings and dormitories, and providing subsidies to students.

While the designation of key national school may usefully help to indicate an expected quality standard, it is clear that at present at least only a minority of schools can reasonably hope to attain that standard, particularly in poorer and rural areas. At the same time, it is clear that the biggest challenge is to improve quality in poorer and rural areas. It would be useful, instead or in addition, to identify a quality standard that all vocational schools should aim to reach, linked to clear mechanisms to ensure that the resources are available for them to do so. This might usefully build on the standard established in 2001 for the establishment of upper secondary vocational schools.

Resources and standards: policy options

- Overall expenditure on education, including VET, should be increased, as recommended in previous OECD reviews of China.
- Given big regional discrepancies in available funding on education, extra resources should be allocated to the poorest localities in order to remove financial barriers to participation in VET and to improve its quality. Mechanisms to this end might include:
 - Centrally allocated per capita funding support for upper secondary education, provided by the national government directly to the counties where upper secondary (including VET provision) is most limited, and where quality (measured in terms of teacher indicators such as pupil-staff ratio and teacher qualifications) is weakest.
 - More fundamentally, enhanced fiscal transfers to ensure a stronger funding base for education at provincial and county level.
- Establish minimum quality standards for schools that all regions of China and all schools can reasonably aim for, instead of, or in addition to, the standards of key national schools. Such quality standards might be linked to resource reallocation.

2.3 Planning and co-ordination

The challenge

China needs to ensure that young people are learning skills relevant to the labour market, and to adapt the mix of training and skills in response to economic change. How does a province, or a county adjust the mix of provision – the numbers of places in different programmes - in vocational schools to changing requirements? This challenge is shared by many countries with different potential solutions available, and these are discussed below. One complicating feature in China is that multiple levels of government are engaged in planning provision – in particular, both provinces and the sub-provincial level (counties and districts) run schools directly, and have an interest in co-ordinating provision.

Like other countries, China can only provide vocational education and training where it has the teachers, the trainers, the classrooms and other equipment necessary to the task. VET institutions⁸ including their staff, embody a historical commitment, and this can limit the capacity to adjust quickly to changing labour market requirements. Even in the long run, cost considerations may constrain provision because some types of equipment are just too expensive for VET institutions. In fast-growing industrial sectors some types of practical skills may be so much in demand that it is difficult to find someone with the relevant skills willing to work as a trainer.

Analysis in support of policy options

Getting the right mix of skills

In China, as elsewhere, policy makers have to decide on how far to give students the vocational programmes they want, and how far they should simply provide the programmes that they believe will meet labour market needs.

Three main models, ideal types, can be identified as ways of determining the number of places on VET programmes (in practice most countries mix these models):

- *Student preference:* Students choose their courses freely, and the VET authorities adjust provision to meet demand, regardless of whether those courses provide skills needed by the labour market.
- *Planned provision:* Provision is planned according to various criteria, including employer advice and forecasts of labour market needs alongside student preferences.
- *Market determination through workplace training:* When workplace training is a necessary element in provision, students aim to choose their courses and programmes, but they are limited to those where employers are willing to offer workplace training. So the mix of provision is determined by the balance of supply and demand in a market.

8. Here, and throughout the report, “VET institutions” is used to describe providers of vocational education and training, including schools, training institutions, colleges and private providers, but excluding workplace training provided by companies.

China has chosen explicitly or implicitly some mix of these models. Their relative advantages and disadvantages are explored below.

Taking account of student preferences

The preferences of students for study programmes are important for three reasons. First, students are normally good judges of their own skills and the characteristics that may make them better suited to one job than another – so following their preferences leads to higher productivity. Second, they also know more about what they most enjoy doing, so that lower monetary returns can be counterbalanced by positive outcomes in terms of well-being. Third, it is counterproductive to coerce students into careers they do not want – the very high proportion of VET graduates in nearly all countries who change occupations after only a few years may reflect welcome career development, but it may also reflect some job mismatch.

But student choice can only improve the match between VET and labour market needs within certain limits. Good career guidance is very important, and this may be a particular challenge in China, given the speed of change in labour markets and in the range of career and educational opportunities. In Western and rural areas it may be difficult for students to gain a very clear sense of the career options available in developed regions in the East. In China, as in OECD countries career guidance is of growing importance, as career and learning routes diversify, sometimes in ways that are bewildering to individual students. But effective career guidance can not only help the individuals involved, but also play a major role in ensuring that students follow career paths that will help to meet labour market needs. The OECD *Learning for Jobs* review argues that career guidance needs major reform in most countries, to ensure high quality well-informed and objective guidance for students (see OECD, 2010, forthcoming).

Planning provision to meet employer needs

One option for China would be to introduce more systematic planning of provision to meet employer needs. Planned provision implies some process of decision-making allowing a VET authority to plan the number of places in different VET courses targeted at different occupations. It therefore implies some constraint on student preference, for example if places are deliberately limited for popular courses because there are few jobs in that field. A number of criteria, alongside measures of student demand and VET institution physical capacity to provide programmes, are typically used to guide the allocation of students to different programmes. These include measures of labour market demand for skills in different areas – often employer views on skills needs, but also independent assessments of skills needs both currently and in the future. The weight of these elements in the final decision of planning authorities varies across countries. In Australia, Ireland and Finland, skills forecasts inform authorities responsible for the planning of VET provision. If China were to pursue more systematic planning of VET provision to meet labour market needs, the question arises of how employers' surveys and skills forecasts might be harnessed to this purpose. The scope for such approaches is considered below.

Balancing student preference and employer needs: potential market solutions

Given that the benefits of VET are realised both by students and employers, an effective VET system needs to reflect both employer demand and student preference. But the optimal balance also depends on who pays: the mix of government, student and employer contributions. For example if most of the costs fall on students – as in some forms of postsecondary training in some countries – then it is reasonable to expect that student choice will dominate the mix of provision. But in China, the cost of providing VET at upper secondary level mainly falls on government and students rather than employers. One very constructive way for employers to make more of a contribution to training, and at the same time obtain many benefits for themselves, might be through the provision of workplace training and experience.

Planning of provision in China might take place, for example at provincial level, such that each province would systematically aims to identify skills requirements in the province and then adjusts upper secondary VET provision to that end. The main difficulty with such an arrangement is the information and administrative challenge. The information challenge is to anticipate future skills requirements, both regionally, and by occupational sector. Planning needs to factor in, again by occupational sector and by province, the relative contribution to the pool of workforce skills of initial VET, taking into account labour market retirements, retraining and, critically in China, migration. Moreover it would need to arbitrate between student preferences and these skills requirements of the labour market, taking into account the varying returns to the two parties of different types of skill. This is a formidable challenge.

These difficulties provide strong arguments for building some kind of local market into provision, as a means of utilising the capacity of markets to convey complex information signals flexibly and rapidly. One such market mechanism might be a system driven by student preference. Employers could influence the number and mix of places in VET through their willingness to offer workplace training. In some countries, supply and demand are brought into balance through a market in apprenticeship training, automatically adjusting provision to the needs of the labour market, while also taking into account student preferences and variations across regions and sectors. Forecasts about future needs for different skills are superfluous in such an apprentice framework.

Co-ordination between different levels of government

In some poorer regions schools compete for scarce resources. The funding available to schools depends on the provider, schools managed by higher level (typically provincial) governments are in general better resourced than schools under the responsibility of lower level authorities. Although competition can in principle improve the quality of schooling by expanding good schools and squeezing out bad ones competition should not be distorted by advantages for certain schools and school providers. The risk is that schools run by different authorities will provide programmes in the same speciality but of different quality (for example, the OECD team was told that a tourism school run by one province prepared students for four stars hotels while a tourism county school provided employees for lower category establishments).

An alternative model would establish stronger co-ordination across different VET providers and more transparent rules in VET funding. Such an arrangement would allow the economies of scale and improvement of the overall quality of upper secondary VET

(all tourism schools would aim to prepare students for high standard hotels and restaurants). Through better co-ordination and planning at the province level VET might be provided in a more rational way. For example in Belgium (Flanders), a VET tertiary programme is not eligible for public funding unless there is a demand from the labour market for graduates from the field of study (Ministry of Education and Training of Flanders, 2009). Similarly, in South Carolina (US), new college programmes proposals must be supported by statistical research and analysis of national, regional and local labour market trends (Rex J, V. Harrison, J. Couch, 2008).

Better co-ordination in VET provision can save money by lowering the cost of equipment and of VET teacher recruitment. Through assessment of local employers and students needs and school capacity, schools might specialise in a specific field instead of every school providing a wide range of programmes. Concentration of practical training in workshops serving a few schools is another way of lowering the cost of VET provision. Better co-ordination between different levels of government is a necessary condition to improve the planning of VET provision according to the principles presented below.

Sharing the benefit, sharing the costs

As the benefits to employers vary between VET programmes, unconstrained student choice of these programmes (even when partly or fully subsidised by government) would not yield the *optimal mix* of VET provision. Suppose, for example, that engineering skills drive innovation and economic growth in a manner which is very helpful to the economy but where the benefits are not captured in the wages of engineers. This would mean that the incentives to pursue engineering qualifications would be limited and there would be fewer VET engineering students than would be socially desirable. Again, either government or local engineering employers might be justified in subsidising provision.

Often when the benefits are shared a risk of under-provision emerges, because all the stakeholders have incentives to *free ride* on the contributions of others. In response to these shared benefits, a variety of funding models have emerged in OECD countries, involving some sharing of the costs of provision between government, student, and employer. Some contributions will be in kind, for example in terms of the time and facilities contributed by employers to workplace training, or through time off work through training. Table 2.2 illustrates some of the different ways in which government and students share the costs at secondary level.

Table 2.2 Who pays for VET?

Percentage of upper secondary VET programmes

	Programmes provided by institutions charging fees	Programmes where students are eligible for support from public funds through:		
		Tax relief*	Loan*	Grant*
Australia ^{1,2}	■■■■■	■■■	-	■■■
Austria	■	■	-	■■■■■
Denmark	■	-	■■■■■	■■■■■
Finland ¹	■■	-	■■■■■	■■■■■
Germany	-	-	■	■
Hungary	-	-	-	■■■■■
Japan	■■■■■	-	■■■■■	■
Netherlands ¹	■■■■■	-	■■■■■	■■■■■
Norway	-	-	■■■■■	■■■■■
Sweden	-	-	■■	■■■■■
Switzerland	-	-	-	■■■■■
Turkey ¹	■■■■■	■■■■■	-	-

Note: Estimated percentage of VET upper secondary programmes: - 0%; ■ 1-25%; ■■ 26-50%; ■■■ 51-75%; ■■■■ 76-100%.

1. Fees are subject to government guidelines in public sector.

2. Most programmes, although ‘upper secondary’ in terms of ISCED level, are outside the school sector.

* For definitions see glossary.

Source: Kuczera, M. (forthcoming), *The OECD International Survey of VET Systems*, OECD, Paris.

Assessing labour market needs: surveying employers

One apparently simple way of assessing skills requirements in the labour market is to ask employers. Consultation may be organised at national level, regionally or by sector, and carried out either through bodies representing employers or through surveys. Sometimes employers are not only consulted, they decide on the mix of provision. For example in Hungary, since 1 January 2008 the Regional Development and Training Committees (more than half of whose members are drawn from the social partners) now have decision-making powers over the number of students admitted to different programmes and over the qualifications to be delivered in the region.

But consultation with employers faces two main problems:

- *It may be hard to find out what employers really want and need.* Employers are a diverse group with equally diverse views, and variable in their capacity and willingness to put energy into articulating their future skills needs. Any measure of “employer views” linked to selected samples of employers therefore risks either being uninformed, or failing to capture variations in the demand for skills over time, place and occupational and industrial sector. In fast-developing parts of the economy, employers may be too new and volatile to form effective lobby groups – creating a conservative bias in the apparent employer voice.
- *Employer interests may not be the same as student interests.* Employers may want very narrow skills in occupational niches, skills for declining industries and for jobs which are unpleasant and badly paid, or an oversupply of skills to drive down wages in the associated occupations. These employer demands need to be kept in balance with the interests of society at large, including the interests of the student.

“Skills shortages” as perceived by employers might also be perceived as “low wage” or “unpleasant job” areas by potential employees or trainees. Employer demand for certain skills is not just a fixed given, since there is scope to adapt technology and the workplace to eliminate the least pleasant jobs and to match the available supply of skills.

Assessing labour market needs: skills forecasts

All education presupposes some vision of the future in which the learning will yield desired outcomes. But the shape of future labour market needs is inevitably misty. The challenge is to identify what can reasonably be predicted some years into the future, and what cannot. In many OECD countries skills forecasts are used as a very broad guide to governments and public agencies in policy making and in some countries (*e.g.* Australia) they have been used to plan VET provision. They are also used to inform students and social partners (Neugart and Schömann, 2002). Many OECD countries forecast trends in employment mainly by occupational categories, often on a time horizon of five to ten years (Neugart and Schömann, 2002). For instance, Canada has developed occupational forecasting models at national and provincial levels to diagnose future skill shortages (OECD, 2004). A recently published report about the future skill needs for 27 European countries presents medium-term forecasts for skills in the European economic bloc as a whole and in each individual country within the bloc for 2015 (CEDEFOP, 2008).

Creating reliable forecasting models is very challenging, since the demand for skills depends on numerous factors, many of which are difficult to predict, such as technological progress, global economic conditions, and government policies – which in turn depend on voting behaviour. Where forecasting models have been evaluated, results show that forecasts can provide useful indications on overall labour market trends, but at the level of specific occupations projections are often unreliable (Neugart and Schömann, 2002; Sexton, 2002; Barnow, 2002; Richardson and Tan, 2007). Many employers find it hard to predict their future requirement for recruits. Empirical evidence shows that students also find it hard to predict which kinds of jobs are going to be in demand in the future (Borghans, Grip, and Heijke, 1996).

In some specific areas, such as health care and education, forecasts may play a more central role. In these areas forecasts of demand are linked to relatively stable demographic trends, and the state is often the dominant employer. Even in these areas, increasingly, international migration complicates the relation between national training efforts and labour supply. In China too, internal migration flows may make it difficult to plan provision to meet skill needs at regional level.

Planning and co-ordination: policy options

- Provide a mix of VET programmes that reflect both student preferences and employer needs.
- Develop planning arrangements to manage the mix of skills provision in consultation with employers while recognising the information challenges.
- Use workplace training and employer willingness to provide it as a guide to the appropriate mix of provision.
- Improve co-ordination in the provision of VET across different levels of government and VET providers.

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Annex A

Programme of the Review Visit

26 October -3 November 2010

Monday 26 October, Shanghai

Meeting with the Municipal Education Commission of Shanghai
Visit to Shanghai Information Technology College

Tuesday 27 October, Shanghai

Visit to Shanghai Institute of Vocational and Technical Education
Shanghai Transportation School

Thursday 29 October, Guiyang

Meeting with the Provincial Department of Education, Guizhou Province
Guizhou Construction School

Friday 30 October, Guiyang

Guizhou Electrics Industry School

Monday 2 November, Beijing

Meeting with school leadership and industry representatives at Beijing
Transportation School
Discussions with officials in charge of VET affairs, and experts from Beijing
Academy of Educational Sciences at the Beijing Municipal Education
Commission

Tuesday 3 November, Beijing

Meeting at the Department of Vocational Education and International
Department
Meeting with Deputy Director General of the National Centre of Education
Development and Research (NCEDR)
Meeting with representatives from the China National Institute of Educational
Research (CNIER)

Learning for Jobs

OECD Reviews of Vocational Education and Training

PEOPLES REPUBLIC OF CHINA

For OECD member countries, high-level workplace skills are a key means of supporting economic growth. Systems of vocational education and training (VET) are now under intensive scrutiny to determine if they can deliver the skills required. *Learning for Jobs* is an OECD study of vocational education and training designed to help countries make their VET systems more responsive to labour market needs.

This special report looks at the system in China. China's education system has made dramatic advances: almost all children in China now complete lower secondary education. Around three quarters continue into upper secondary schools, with fast increasing numbers in tertiary education. At upper secondary level about half the cohort enter vocational schools – more than 20 million students.

At the same time the system faces significant challenges. The government is seeking to make the system accessible to all students – by removing the fees barrier, ensuring minimum quality standards in all vocational schools, and in providing adequate high quality workplace training opportunities. This report sets out some policy options for China to address these issues:

- Increase spending on education, directing expenditure to those areas of China that need it most.
- Realise a standard minimum period of workplace training, with quality standards, for all upper secondary vocational students; consider financial incentives to that end.
- Ensure the mix of provision reflects both student preferences and employer needs. Ensure co-ordination of planning across levels of government.

The OECD is conducting country VET policy reviews in Australia, Austria, Belgium (Flanders), the Czech Republic, Germany, Hungary, Ireland, Korea, Mexico, Norway, Sweden, Switzerland, the United Kingdom (England and Wales), and the United States (South Carolina and Texas). Special reports on China and Chile have been published. The initial report of *Learning for Jobs* is available on the OECD website. The final report on the study's findings is to be published in September 2010.

Background information and documents are available at www.oecd.org/edu/learningforjobs.