

## Chapter 4

### Taking Advantage of Workplace Training

*In all countries, employers make extensive use of their workplaces to train their existing employees, but countries differ greatly in the extent to which they use workplace training to develop the vocational skills of young people. Workplace training has many advantages. It provides a strong learning environment, it can improve transition from school to work by allowing employers and potential employees to get to know each other, it contributes to the output of the training firm, and it links training provision to a direct expression of employer needs.*

*To take full advantage of workplace training, the training needs to be of high quality and employers need to be willing to provide it. This means good quality assurance mechanisms, balanced by effective incentives for employers.*

*Apprenticeship, one main model of workplace training, faces two main challenges: encouraging employers to offer a sufficient number of training places, and ensuring that the training provided is of good quality. Meeting both challenges at the same time is hard since quality requirements can be burdensome for employers; so the design of the apprenticeship system needs to be in balance. An ideal apprenticeship system will involve high quality training providing transferable as well as occupation-specific skills. It will be attractive to a wide range of employers, be relevant and appealing to apprentices, have a low dropout rate and offer adequate wages. Countries use many types of financial incentives to encourage workplace training, including direct subsidies, special tax breaks and training levies.*

Workplace training includes first, formal apprenticeships typically involving a contract, lasting for a period of two to four years and leading to a formal qualification, second, other shorter and often less formal training and work experience for young people and, third, training for employees. Our interests lie mainly with the first and second elements, the apprenticeships and other less formal training which form part of initial vocational education and training (VET).

For a would-be electrician, vocational training includes theory (the physics of electricity), practical hands-on skills (how to wire a house) and practical generic skills (dealing with clients). In countries with strongly developed apprenticeship systems, like Australia, Austria, Denmark, Germany, Norway and Switzerland, work placements typically form a large part of the programme of study (see Table 4.1 and Figure 4.1).

**Table 4.1 Time spent by VET students in work placements\***

Estimated percentage of secondary VET students, by time spent in work placement  
(as ratio of the total programme length)

	% of programme length spent in work placement with employers			
	75% or more	Between 50% and 75%	Between 25% and 50%	Less than 25%
Australia <sup>1</sup>	■ ■	-	-	-
Austria	■ ■	-	-	■ ■ ■
Czech Republic	-	-	-	■ ■ ■ ■
Denmark	-	■ ■ ■ ■	-	-
Finland	■	-	-	■ ■ ■ ■
France	■	-	-	■ ■ ■
Germany <sup>2</sup>	-	■ ■ ■	-	■
Netherlands	-	■ ■	■ ■ ■	-
Norway <sup>2</sup>	-	■ ■ ■ ■	-	-
Sweden <sup>2</sup>	-	-	-	■ ■ ■
Switzerland <sup>1</sup>	■	■ ■ ■ ■	-	-
United States	-	-	-	■ ■ ■ ■

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

1. In Australia and Switzerland the amount of workplace training depends on the institution and programme.

2. Some missing data, so not all programmes are represented.

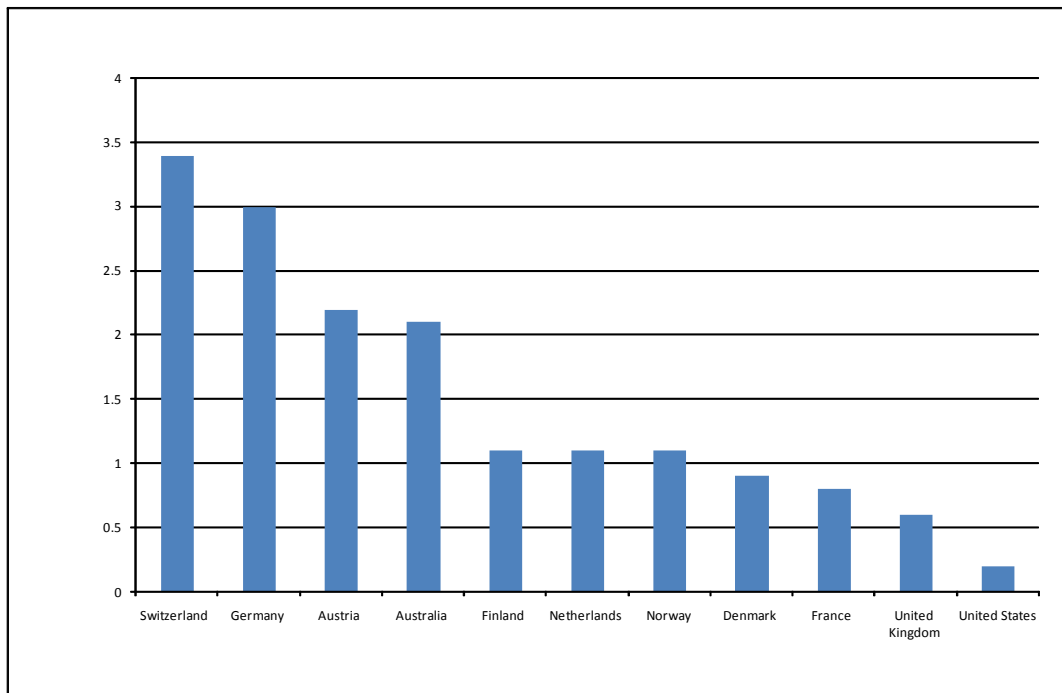
\* For definitions see glossary.

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

Apprenticeships are one of the oldest established institutions in education and training. They often involve some form of blended on- and off-the-job training but the design is highly variable, ranging from the alternance arrangements in the dual system with apprentices attending school one or two days a week to the Norwegian arrangement with two years of school followed by two years of workplace training. For many countries apprenticeship represents a core element of initial VET, although this is highly variable between countries (see Figure 4.1). Apprenticeships are found in the traditional trades as well increasingly, in technical areas such as laboratory and hospital technicians. In Switzerland for example, a new “IT engineer” occupation was designated in the 1990s with an associated apprenticeship. Apprenticeships in these technical areas are called “modern apprenticeships” in some countries.

**Figure 4.1 How common are apprenticeships?**

Apprentices as a percentage of those aged 15 to 64: 2001 estimate



Source: NCVER [www.ncver.edu.au/research/proj2/mk0008/internat.htm](http://www.ncver.edu.au/research/proj2/mk0008/internat.htm); NCVER, using data from CIA; CEDEFOP; US Department of Labor.

#### 4.1 The advantages of workplace training

There are four major advantages of training in workplaces rather than in VET institutions. First, workplace training can offer a very high quality learning environment, allowing students to acquire practical skills on up-to-date equipment and under trainers familiar with the most recent working methods and technologies; it also allows them to develop key soft skills – such as dealing with customers – in a real world environment. Second, it facilitates a two-way flow of information between potential employers and employees, making later recruitment much more effective and less costly. Third, employer provision of workplace training provides a signal that a VET programme is of labour market value. Fourth, trainees in the workplace normally make a productive contribution. The four points are developed below.

##### *A strong learning environment*

Workplaces provide a strong learning environment because they offer real on-the-job experience. This makes it easier 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 an apprentice 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. Soft skills like these are hard to develop away from the concrete demands of a real workplace. A study of sales assistants in Denmark (Aarkrog, 2005) found that soft skills were best acquired on the job. Simulating practice at school (*e.g.* through role play) was perceived by students as artificial and useless. A study from Finland (Lasonen, 2005) found that workplace training taught students entrepreneurship, promoted maturity and supported the development of practical soft skills like initiative, problem-solving skills and the use of information sources. While some relevant theory may be best learned in a classroom environment, workplaces are often necessary to bring that theory to life. 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).

### ***Information flow to improve recruitment***

In the workplace, employers and trainees and apprentices get to see each other for what they are, on Monday mornings, when under pressure, and when there is conflict. There is abundant research to show that the characteristics on display in these contexts are critical to job performance. 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 apprentices is in a position to recruit the best from among them. Companies can use this information advantage to pay salaries below the individual's post-training productivity (Acemoglu and Pischke, 1998; 1999a; Leuven, 2005). This is the *recruitment benefit* to employers of workplace training (see glossary).

These benefits to employers depend on labour market characteristics and regulations, including the extent of asymmetry of information in the labour market, the degree of recognition of qualifications, search costs, and wage-bargaining mechanisms (Acemoglu and Pischke, 1999b).

- Where labour turnover is high, so that apprentices often move to other jobs, or only stay briefly following recruitment, the risk of “poaching” is increased, and the recruitment benefit is consequently reduced.
- 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 formal apprenticeships is less.
- Conversely, where wages are inflexible, perhaps determined through collective bargaining, and where there is a high level of job security, a new recruit represents an expensive long-term commitment, carrying a substantial risk. Identification of the most productive workers in advance of formal recruitment is therefore more advantageous and the recruitment benefit is greater.

- Factors like national service requirements – for example in Switzerland and South Korea – create a gap in time between initial workplace training and subsequent entry to the labour market, and may make it less likely that training companies can hold on to their apprentices as recruits.

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.

### ***Productive contribution***

Apprentices and trainees undertake useful work generating a *productive benefit* for the employer (see Box 4.1, and evidence from Switzerland and Germany in Schweri *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. Wolter and Schweri (2002) also showed that the one-third of firms which did not derive a net benefit at the end of the apprenticeship period nevertheless benefited in most cases because of the recruitment benefit – they were able to keep the VET graduates they had trained. 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). Such a productive contribution is only occasionally possible from VET students in other contexts – usually those most closely resembling real workplaces – for example in the many catering colleges which operate as restaurants for members of the public.

#### **Box 4.1 The costs and benefits of apprenticeships in Switzerland**

In 2000 and 2004, around 2 500 host companies took part in a survey to determine the costs and benefits of apprenticeship training. Another survey is planned for 2009.

The *gross costs* of apprenticeship training are the resources which would be released by not taking apprentices. They include apprentice salaries, vocational trainer fees, labour costs for administrative tasks and recruitment, installation costs, cost of materials, and some other costs.

The *benefit* to host companies derives first from the *productive benefit* that apprentices generate over the course of the VET programme. The productive output of apprentices is therefore calculated in terms of the costs of employing someone else to generate this productive output.

By comparing the host company's gross costs and apprentices' productive output together, we obtain the host company's *net loss* (*i.e.* if gross costs exceed productive output) or the host company's *net benefit* (*i.e.* if productive output exceeds gross costs).

In 2004, Swiss companies invested a total of CHF 4.7 billion in apprenticeship training. At the same time, the productive output generated by apprentices stood at CHF 5.2 billion. Overall, apprenticeship training was therefore a good investment for Swiss companies. Around two-thirds of host companies obtained a net benefit from their apprenticeship training activities. In most cases, the one-third that generated a net loss were able to recover their loss in the short- and medium-term by hiring the VET graduates that they themselves had trained during the VET programme by reaping the recruitment benefit.

### ***Ensuring VET provision matches labour market needs***

As argued in Chapter 2, employer willingness to offer workplace training places is an indicator of their support for the associated VET programme. Employers will be particularly keen to offer apprenticeships in contexts where they have labour shortages – both because apprentices contribute to production and because they may be future recruits (both the production and the recruitment benefits will be high). Unlike school-based VET, workplace training is therefore automatically linked to labour market needs. The “market” in apprenticeship places becomes a domain where student career objectives have to be balanced with employer interest – a dress rehearsal for the real labour market.

Even where short work placements are all that is involved, as in some VET programmes, the placements can serve to signal the skills needs of employers. In Sweden, the OECD review (Kuczera *et al.*, 2008a) recommended that in upper secondary school-based VET programmes, the currently nominal 15-week period of workplace experience should become mandatory. Apart from its intrinsic benefits as a learning experience, this proposal is explicitly designed to grant employers leverage over the mix of VET programmes offered by VET institutions, since a programme would only run if an employer is prepared to offer workplace experience.

### ***Balancing workplace and other training locations***

Despite all the advantages of workplace training, it needs to be supplemented by the use of other training locations, since:

- Vocational theory (see glossary) like a butcher’s knowledge of anatomy is often best learned away from the workplace in a classroom setting.
- Some practical skills can be more effectively learnt off the job.
  - Where equipment is expensive or dangerous, simulated work environments may be more cost-effective. For example, training train drivers in simulated cabs is more cost-effective than on-the-job training, with real trains (and associated line closures).
  - Off-the-job training can operate at a slower pace and provide students with time to first initiate their skills (Robertson *et al.*, 2000).
  - Economies of scale may mean that it is best to teach some skills collectively in training workshops, (whether in a public VET institution, or in a training centre funded by a whole group of companies) rather than in the workplace.
- Local employers may not always be able to provide all the required training. Variations between firms – even within the same sector – in terms of products, markets, clients and technology mean that learning opportunities are not the same for all VET students in workplaces. Off-the-job training can fill potential gaps in the skills provided.
- General skills, including numeracy and literacy skills, are extremely important in nearly all jobs directly, and critical to adaptability and the learning of new skills. Although such skills can be embedded in other forms of learning, including workplace learning, classroom environments are the traditional context for acquiring these skills.

## 4.2 Ensuring quality in apprenticeships

### *Quality standards*

A good quality apprenticeship involves adequately prepared workplace trainers guiding the development of the apprentice, providing a good range of vocational skills – including both hard and soft workplace skills – and offering an effective route into the relevant job. More specifically:

- VET institutions and work-based training should complement each other. The relationship between apprentices, employers and VET institutions is a key factor determining the success of training: they should have a common understanding of the training, as well as clearly defined roles and responsibilities (Schofield, 1999).
- Apprentices should perform a variety of tasks, either within a firm or by rotating across firms (Gruber, Mandl and Oberholzner, 2008). Tasks should increase in complexity over time and allow trainees to work autonomously and practice their skills (Robertson *et al.*, 2000).
- As argued in Section 3.1, well-prepared workplace trainers play a crucial role. The quality of the relationship between apprentices and their colleagues is also important to informal skills development particularly in SMEs (Robertson *et al.*, 2000; Harris, Simons and Bone, 2000).

Firms are always interested in the immediate productive contributions of apprentices, sometimes less concerned with providing for a good learning experience (Cornford and Gunn, 1998; Kilpatrick, Hamilton and Falk, 2001; Gibb, 1999). The question arises whether the productive contribution of apprentices is at the expense of training quality. In analysing firms' motives for training, some authors distinguish between substitution motives (*i.e.* substituting apprentices for workers) and investment motives (*i.e.* training to meet a future need of qualified labour) (Franz and Soskice, 1995; Neubäumer and Bellmann, 1999 in Mohrenweiser and Backes-Gellner, 2006; Smits, 2006). Research from Norway (Askilden and Øivind, 2005) and the Netherlands (Smits, 2006) suggests that firms training for substitution motives tend to use trainees as a cheaper substitute for unskilled workers. Smits (2006) found that the quality of training is better in firms training with investment rather than substitution motives.

Evidence from Switzerland provides a counter-example. Dionisius *et al.* (2008) indicate that, despite the difference in terms of productive contribution, the relative performance of Swiss and German apprentices seems to be identical at the end of training. Swiss firms manage to pay off the costs of training during the training period by allocating students to productive tasks and using apprentices in skilled jobs to a greater extent than German firms. This shows that using apprentices productively does not necessarily imply using apprentices as cheap unskilled labour. The authors further argue that the main reasons for the higher cost-efficiency of training in Switzerland include high training costs (wages of apprentices and trainers, equipment), a less regulated labour market and higher labour force mobility than in Germany, and regulations setting up minimum requirements for the quality of training. High apprentice costs mean that there is no real incentive to substitute apprentices for unskilled labour and they must instead seek returns by placing them in skilled jobs. The existence of regulations setting out the content of workplace training (Smits, 2006) and quality standards (Dionisius *et al.*, 2008) are identified as essential to ensure high quality learning.

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). There is also variation in the quality of training according to the characteristics of firms. Research from Australia suggests that small firms are also unlikely to have dedicated training staff (Hawke, 1998) and 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. This argues for quality standards and clear learning objectives for workplace training. Learning objectives should be developed with the involvement of employers to ensure relevance to their immediate needs but balanced by sufficient emphasis on transferable skills to allow for future mobility.

These considerations argue for quality control carefully applied to apprentice training to ensure that the employers involved deliver on their training responsibilities. At the same time, the quality requirements should not be so demanding as to inhibit employer participation.

Quality standards are a binding set of rules defining the terms of workplace training. They may cover the content and duration of training, the assessment of training outcomes and trainers' qualifications. Quality standards should help avoid the allocation of students to unskilled tasks and prevent training narrowly focused on firm-specific skills. Quality standards should ensure that training meets minimum standards in all workplaces. In a review of apprenticeships in several European countries, Ryan (2000) suggests that in the UK the lack of external regulations for apprenticeships leaves room for low quality training, while in Germany and Denmark there is stronger quality control and permission for training is withdrawn for companies that provide substandard training. Similarly, in Switzerland firms need to meet quality standards to be licensed to take on apprentices and the quality of practical training is monitored.

**Table 4.2 Quality assurance in enterprises providing practical training\***

	Curriculum	Training content	Programme duration	Physical resources	Number of training places	Qualifications acquired	Educational performance	Labour market performance
Australia	no	yes	no	no	no	no	no	no
Austria	yes	yes	yes	yes	yes	yes	yes	no
Czech Republic	no	No	no	no	no	no	no	no
Denmark	no	No	no	no	no	yes	no	no
Finland	no	No	no	yes	no	no	yes	yes
France	no	No	no	no	no	no	no	no
Germany	yes	yes	no	no	no	yes	yes	no
Hungary	**	**	**	**	**	**	**	no
Netherlands	m	m	m	m	m	m	m	m
Norway	m	m	m	m	m	m	m	m
Sweden	***	***	***	***	***	***	***	***
Switzerland	yes	yes	yes	yes	yes	yes	yes	no
United States	no	No	no	no	no	no	no	no

Note: m: missing.

\* For definitions see glossary.

\*\* In Hungary the Chamber of Commerce and Industry operates the quality assurance system covering the conditions needed to start workplace training, interim checking to ensure that the training is done under prescribed circumstances, and that its content and methodology is appropriate.

\*\*\* In Sweden, the Swedish Schools Inspectorate has a mandate to examine the quality of workplace training, and locally, education/governing boards are responsible for workplace training.

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

Table 4.2 provides information on quality assurance practices in selected OECD countries. Given the need to encourage and support workplace training, quality control may need to take the form of supportive measures for employers, rather than a bureaucratic obstacle to firms wishing to undertake workplace training. The *QualiCarte* project in Switzerland (Box 4.2) provides an example of a tool that supports employers in improving their training.

#### **Box 4.2 Quality control of workplace training in Switzerland**

Host companies are responsible for checking the progress of students. Developed with the social partners, the *QualiCarte* provides a checklist of 28 quality criteria describing key aspects of workplace training (including the engagement of the company, particular aspects of the initial phase of the training and the subsequent training process). These criteria are used by companies for self-assessment.

Cantonal authorities control the quality of workplace training by issuing licenses, which host companies must obtain to provide workplace training to VET students. To acquire a license, companies must meet technical and personal criteria, and demonstrate that their training programme complies with quality standards and the content of training matches the needs of the occupation.

Source: Federal Office for Professional Education and Technology, 2008, *Vocational and Professional Education and Training in Switzerland*. National report from Switzerland contributing to the OECD's review of "learning for jobs" Federal Office for Professional Education and Technology, Bern.

### Legal framework

Special contracts for apprentices or trainees exist in many countries. Table 4.3 sets out some of the contractual characteristics of different workplace training schemes. In some countries (*e.g.* Germany, Austria and Switzerland) students are responsible for finding a company that will provide them with workplace training. Conversely, in Hungary, VET institutions often help students find apprenticeship places and then the contract is signed between the firm and the apprentice under the supervision of the regionally competent chamber of commerce. Some countries (*e.g.* Australia and Norway) involve third partners in the apprenticeship under the supervision of the regionally competent chamber of commerce. Box 4.3 provides examples of the terms of apprenticeship contracts in three countries.

**Table 4.3 Contracts for workplace training**

Estimated percentage of VET upper secondary programmes in workplace training by contract characteristics

	Basis of contractual status			Contractual parties			Characteristics of the contract		
	Mandatory	Non mandatory	Varies <sup>1</sup>	Employer	Trainee	VET institution	Employment	Training	Combining training and employment
Australia	■ ■	■ ■ ■		■ ■ ■ ■	■ ■ ■ ■	■ ■	-	-	■ ■
Austria	■ ■ ■ ■	■		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■	■ ■ ■ ■	■
Denmark	■ ■ ■ ■	-		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	-	-	■ ■ ■ ■
Finland	■	■ ■ ■ ■		■ ■ ■ ■	■	■ ■ ■ ■	-	■ ■ ■ ■	■
France	■ ■	-		■ ■	■ ■	-	-	-	■ ■
Germany	■ ■ ■	-		■ ■ ■	■ ■ ■	-	-	■ ■ ■	-
Hungary	-	■ ■		■ ■	■ ■	■ ■	-	-	■ ■
Netherlands	■ ■ ■ ■	-		■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■	-	-
Norway <sup>2</sup>	■ ■ ■ ■	-		■ ■ ■ ■	■ ■ ■ ■	-	-	-	■ ■ ■ ■
Switzerland	■ ■ ■ ■	-		■ ■ ■ ■	■ ■ ■ ■	-	-	-	■ ■ ■ ■

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

1. Varies depending on institutions, programmes and fields; m : missing; na : response does not apply.

2. Local government is also part of the contract.

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

### Box 4.3 Contracts for workplace training

In Australia, the Australian Apprenticeship/Traineeship Training Contract is a legally binding agreement between the employer and the apprentice. A representative of the Australian Apprenticeships Centre is required to be present at the signature of the contract, 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 vary the contract.

Source: [www.training.com.au/portal/site/public/menuitem.7e75abb80a4e4690f9fa5a1017a62dbc/](http://www.training.com.au/portal/site/public/menuitem.7e75abb80a4e4690f9fa5a1017a62dbc/)

In **Switzerland**, an apprenticeship contract is signed by the VET student, the student's legal guardian and the host company. 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: Federal Office for Professional Education and Technology, 2008, *Vocational and Professional Education and Training in Switzerland*. National report from Switzerland contributing to the OECD's review of "learning for jobs" Federal Office for Professional Education and Technology, Bern.

In **Austria**, a training contract between the host company and the student forms the basis of the training relationship. The student (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: <http://www.bmukk.gv.at/schulen/bw/bbs/berufsschulen.xml#toc3-id4>

A study of five European countries (Germany, Austria, Denmark, Ireland and the United Kingdom [Ryan, 2000]) identified the existence of a strong institutional framework, including a legal framework for apprenticeships, as an important condition for the successful implementation of apprenticeship training. An apprenticeship, or traineeship contract, setting out the rights and obligations of both trainees and receiving firms can be a tool to control the quality of workplace training. In Mexico, employers reported to the OECD review team that the lack of legal arrangements (in particular concerning the insurance of trainees) is a barrier to the expansion of workplace training in VET. The creation of a contract for trainees, setting out legal arrangements, would solve this problem: it would avoid the need for individual employers to make their own arrangement for a contract, and it would cover trainees against unforeseen risks. By setting out the rights and obligations of both trainees and receiving firms, such contracts could also be a tool to control the quality of workplace training. As a result the OECD review of Mexico recommends the establishment of a trainee contract (Kis, Hoeckel and Santiago, 2009).

*Continuous vs. sequential training: need to allow for flexibility*

Classic continuous dual apprenticeship training involves one or two days of schooling in the VET institution and three or four days of training and working in the company throughout the three or four years of apprenticeship training. However, some occupations require substantial theoretical and practical training before an apprentice is able to do meaningful work. Many different models have therefore emerged, with apprentices spending months, or even up to two years, in a VET institution or in specialised training centres before working in a company. Some other factors include:

- The extent to which prior learning is needed affects the cost-benefit ratio to firms. When prior theoretical knowledge has to be acquired over a long period before the apprentice is able to do meaningful work, the government may organise prior training in VET institutions at public expense, or consider whether training organised by a group of companies could be more cost-effective.
- The most effective systems offer firms the flexibility to choose the system best adapted to their needs. Flexibility regarding the duration of the apprenticeship training is important for both employers and apprentices: it helps ensure that apprentices reach their training objectives and that the costs and benefits of the training to employers will be in balance.

### 4.3 Making workplace learning reality: incentives for employers and trainees

*Incentives for employers*

The incentives on employers to provide apprenticeship places depend on the benefits and costs they expect from training. As discussed, employers gain both a production and a recruitment benefit from apprenticeships. In addition, employers sometimes say that training apprentices is a social responsibility, and, more subtly, that trainees ask questions, encouraging a reflective approach to the work. In many OECD countries governments offer additional incentives for employers to take apprentices (see Table 4.4).

The costs of apprenticeships to employers are of two main types: apprentice wages, and the resource costs of training the apprentices:

- Apprentice wages vary markedly. For example in Australia the 2006 weekly rate for apprentices in their first year ranged from 47% to 75% of the minimum wage depending on the industrial sector; by the fourth year all apprentices receive the federal minimum wage, or more (Australian Fair Pay Commission, 2006). In Norway, apprentices receive a wage negotiated in collective agreements that ranges from 30% to 80% of the wage of a qualified worker, the percentage increasing over the apprenticeship period (Kuczera *et al.*, 2008b).
- The resource costs of training apprentices include the time of experienced employees, mistakes by inexperienced apprentices and wasted resources (Richardson, 2005), remunerations of training staff, teaching materials and administrative costs (Rauner, 2007). These costs are dependent on the quality of apprenticeship training provided, covering issues like whether special training is provided to supervisors, whether apprentice supervisors have some additional status and wages to reflect their role and so on.

Both benefits and costs are hard to estimate, although firms are getting better at doing so. In Switzerland half of firms with apprentices either have formal mechanisms to monitor the cost/benefit ratio of their training, or were about to introduce such mechanisms in 2004<sup>6</sup>. But many firms lack such mechanisms and rely instead on perceptions of the utility of training (Davidson *et al.*, 1997; Schweri *et al.*, 2003)

Systematic studies have been undertaken in Germany and Switzerland into the costs and benefits to employers of taking apprentices (see Box 4.1).

### ***Government-provided incentives for employers***

As argued in Section 4.1, there are important spillover benefits from many forms of VET, including workplace training, since there are benefits not only to the employer offering training, but also to the student, as well as to other employers and society at large. This common interest in workplace training provides an argument in principle for governments to encourage and support workplace training. Governments use a mix of direct subsidies, tax breaks, levy arrangements and in-kind arrangements (see Table 4.4).

**Table 4.4 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

\* See glossary for definitions.

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

A flat-rate subsidy to employers per apprenticeship place offered has two potential weaknesses. First, many of the apprenticeship 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.<sup>7</sup> Evidence suggests that the effectiveness of a subsidy, as an incentive for a firm to train, is mixed. Brunello (2009) discusses evidence from a Danish study by Westergaard-Nielsen and Rasmussen (1999), arguing that although the effects of a subsidy on the willingness to provide an apprenticeship place is modest

<sup>6</sup> Information provided by OPET Switzerland.

<sup>7</sup> In Norway the subsidy for providing apprenticeships for adults is lower than the subsidy for apprenticeship training for upper secondary students. This may reduce adult learners' chance of obtaining apprenticeships.

(demand for apprentices would have been 7% smaller in the absence of a subsidy) it may still represent good value for money, given the expensive alternative option of having pupils in vocational schools. In Switzerland a simulation exercise suggested that subsidies would have an impact only on firms that are not involved in apprenticeship but have no effect on the supply of apprenticeship training in firms that train already (Mühlemann *et al.*, 2007). In Austria, subsidies had very little impact (Wacker, 2007).

The design of apprenticeship systems is characterised by trade-offs between different factors, which all need to be in balance for the system to be effective. The required quality of training needs to be sufficiently high to deliver for the student and for the economy, but not so high as to become an obstacle to employer engagement. Apprentice wages have to be sufficient to attract good apprentices and inhibit dropout, but not so high as to become yet another obstacle to employer provision. The apprenticeship period and its relationship to apprentice wages – which typically rise as the apprentice skills develop – also need to be balanced. It needs to be short enough to inhibit dropout into jobs by near-fully trained apprentices, but not so short that the employer loses the productivity benefit of apprentices, which are largely obtained towards the end of the apprenticeship period.

For employers the net benefits of workplace training must yield sufficient incentive to encourage the provision of training places, but this can be achieved in different ways. For example this might involve (as in Switzerland) relatively low apprentice wages, balanced by strong requirements on training companies in terms of the preparation of apprentice supervisors and adherence to the national curriculum. In Switzerland this mix is deployed to support an apprenticeship system without recourse to subsidy.

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. For example in Hungary, employers are required to contribute 1.5% of their payroll, representing almost one-third of total national expenditure on school-based VET (Hungarian Ministry of Labour and Social Affairs, 2008). Enterprises can either contribute this sum to the Labour Market Fund, or alternatively offset some or all of their contribution against provision of practical training for VET students, direct support to VET institutions for development purposes or training for their own employees. Economic growth fuelled a fivefold expansion in the Labour Market Fund between 1998 and 2004.<sup>8</sup> Box 4.4 summarises the rather mixed evidence on the effectiveness of levies.

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<sup>8</sup> *Source:* Hungarian Ministry of Education, Hungarian Ministry of Employment and Labour, cited in Köpeczi Bócz and Bükki (2006a, p. 65).

#### Box 4.4 Do training levies work?

Training levies may be used to raise revenues for public policy initiatives, increase training levels beyond what is provided by firms and promote a more equitable distribution of training opportunities among employees and between industry sectors (Billett and Smith, 2005). They may promote firm-based training and give employers more freedom to manage their training activities (Gasskov, 2003), while allowing public authorities to influence training by defining conditions for eligibility for funds from the levy (Dar, Canagarajah and Murphy, 2003). However, they also sometimes subsidise training that would have been provided anyway (Dar, Canagarajah and Murphy, 2003). In this case, they are simply a windfall for the firms concerned (Gasskov, 2003).

Evidence also suggests that **universal training levies** are ineffective in ensuring an equitable distribution of training opportunities: firm size and employee characteristics typically shape access to training (Billett and Smith, 2005). The administrative procedures associated with claiming reimbursement or setting expenses against the levy contribution are often complicated and may discourage smaller firms from filing claims (Edwards, 1997). Large firms with well-established training programmes and administration tend to benefit disproportionately from the levy (Gasskov, 1998). Empirical evidence on the French levy scheme indicates that training opportunities are skewed in favour of large firms and more highly skilled employees, while small firms and employees with lower skills are less likely to benefit (Goux and Maurin, 1997). Similarly, the Korean training levy encouraged skills development, but large companies benefitted more than SMEs, even though the system included a special incentive for SMEs (Lee, 2006).

Training levies require careful supervision; otherwise it is hard to ensure that the training funded through the levy is of sufficient quality. Unfortunately, the supervision of training quality is sometimes carried out by tax auditors or departments that may lack the relevant expertise. Conversely, effective quality control inevitably implies substantial costs both for regulating authorities and the firms being regulated (Dar, Canagarajah and Murphy, 2003).

**Sectoral training funds** have been established in the Netherlands and also in the UK in the field of construction. Smith and Billet (2005) argue that sectoral levies work in some industry sectors and may be more attractive to firms than universal levies: they are negotiated through collective agreements and give employers control over the arrangements for the fund. However, they also share the main weaknesses of training levies (CEDEFOP, Briefing Note, 2008).

In theory, sectoral levies can be effective tools that support strategic objectives of the sector and, if firms perceive significant returns to training in industry-specific skills, they can help increase training expenditure by firms (Smith and Billett, 2005) but an empirical study on the sectoral levy in the Netherlands (Van den Berg, Meijers and Sprengers, 2006) failed to find evidence that the levy encourages either initial or continuing training.

Smith and Billet (2005) suggest that sectoral levies are ineffective in promoting equity in the distribution of training expenditure within firms. This contrasts with a study by CEDEFOP which suggests that sectoral training funds usually contribute to a more equal distribution of training opportunities among under-represented groups, (CEDEFOP, 2008 Briefing Note).

#### *Other non-financial measures*

In some countries there are special bodies that aim to facilitate employer engagement in apprenticeships. 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 involved in apprenticeship training and thereby remove a

considerable burden from employers. (This is particularly important for SMEs). They may also employ apprentices and hire them out to host employers (see Box 4.5).

#### **Box 4.5 External bodies involved in apprenticeship training**

**Australia:** In Australia, group training organisations (GTOs) are not-for-profit organisations 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](http://www.ncver.edu.au/publications/bytheme.html).

**Norway:** In Norway training offices (TO) (*opplæringskontor*) are owned by companies and usually relate to specific trades. TOs work actively 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 (Norwegian Directorate for Education and Training, 2008).

**Switzerland:** Under the 2004 VET Act, the Swiss government established vocational training associations (*Lehrbetriebsverbände*). These are groups of firms that share apprentices. The aim is to allow firms that do not have the capacity and resources to provide full training of an apprentice to become engaged and to decrease the financial and administrative burden on each individual firm. One of the firms of the association has the overall responsibility for the training of the apprentices, signs the apprenticeship contract and represents the association externally. The Confederation subsidises the *Lehrbetriebsverbände* with initial funding (*Anschubfinanzierung*) during the first three years for marketing, administrative and other costs necessary to set up the joint training programme. After this initial support, the training associations are supposed to be financially independent. An evaluation (OPET, 2008) has revealed positive results in that a majority of firms in training associations would not have engaged in training otherwise.

#### *Occupational licensing*

Firms may be encouraged to train their staff if their occupations are licensed and therefore have to be certified against particular standards. However, Billett and Smith (2005) warn that using licensing as a means of encouraging training carries the risk of fostering superficial training and certification and potentially weakening licensing arrangements that exist for other reasons (*e.g.* health and safety).

#### *Sustaining incentives for employers during the economic crisis*

Economic pressures can limit the active participation of employers. Employers face a myriad of competing pressures and demands, and as indicated in the introduction, they tend to be reluctant to offer workplace training during economic downturns. Economically depressed regions may face a similar problem. In a depressed region one might encourage young people to seek workplace training in a different part of the country in a sector with good job prospects. This must be balanced against the potential challenges to younger people of living away from home, sometimes with weak adult supervision. In the interests of regional equity, it may sometimes be necessary to

compensate for the lack of workplace training through additional provision in VET institutions.

In late 2008, the global economy entered a downswing and the length and depth of this downswing remains uncertain. In a recent review of the evidence of the effects of downturns on apprentices and initial workplace training, Brunello (2009) notes the limited evidence, but suggests that normally apprentice numbers drop even faster during recessions than do the numbers in employment, although incumbent employees may experience an intensification of training effort. During downswings employers tend to shed labour and become more reluctant to take trainees and apprentices. In a weak economy with low demand the production benefit may be limited, and the expected recruitment benefit depends on the risky assumption that the employer will weather the downturn and expand again.

In Australia, during the early 1990s recession, apprentice numbers fell from 161 000 to 120 000 over the period 1990-93 (NCVER, [www.ncver.edu.au/research/proj2/mk0008/growth.htm](http://www.ncver.edu.au/research/proj2/mk0008/growth.htm)). The relative vulnerability of apprentices and ordinary employees to a recession will depend on local circumstances. One analysis of the impact of the 1930s depression on engineering apprentices in England argued that during this period apprentices were used to substitute for full employees (Hart, 2005).

Taking on an apprentice represents a future commitment, often over several years. Apprentice contracts vary, but may be tightly binding on an employer, partly to ensure that employers are committed to the longer-term development of their apprentices. Employers may be very reluctant to take on such a potential risk during a period of intense uncertainty about the immediate economic future.

Potential policy responses to the crisis, designed to cushion apprenticeships and other forms of workplace training include:

- Temporary subsidies for apprentice starts: One objection is that most of the apprentice starts would happen without the subsidy. Another is that this might become an incentive for employers to use apprentices as cheap labour.
- Creation of more apprenticeship places in the public sector.
- Some means of sharing risks between different employers for taking on an apprentice. One option is to arrange for government sponsored bodies to take on apprentices and for employers to host the apprentices, as in the group training organisations in Australia.
- More practical training in VET institutions to compensate for the loss of workplace training.
- More time spent in general education, with job-specific training shifted to later stages in the education and training systems.

Brunello (2009) argues for policy that encourages training on and off the job during recessions – given the risk that young people may otherwise find themselves trapped in temporary jobs with few training opportunities. Drawing on Bassanini and Brunello (2008), he argues that “training policies are not necessarily the only and perhaps not the best tool available to support training in a prolonged downturn: structural policies that favour product market competition and labour market policies that reduce the dualism between protected insiders and unprotected outsiders may deliver better payoffs than

subsidies to workers and employers, which are plagued by the presence of deadweight and substitution effects.”

### *Incentives for potential apprentices*

A strong apprenticeship system needs to be attractive to potential apprentices as well as employers. Apprentices normally receive a wage, as noted above, and they may also get some type of government grant for subsidy. In return they should receive good quality training and the reasonable prospect of a smooth entry into the target occupation. From the apprentice point of view, the appeal of this form of training is comparative, depending on what else is on offer. Typically this will depend on the relative attractions of an academic track in tertiary education, or alternatively direct entry into the labour market.

Apprenticeships and other forms of workplace training may also smooth the transition to the labour market. Practical training in a company as part of initial VET may facilitate the transition from education and training to the labour market and reduce the cost of training graduate recruits, although the empirical evidence on the labour market outcomes of VET with workplace training is admittedly somewhat mixed. In Germany, economic activity was higher among apprentice graduates (who have received workplace training) than among university graduates and graduates from school-based VET (who typically lack workplace experience) although the duration of unemployment was longer for apprentice graduates than for other groups<sup>9</sup> (Winkelmann, 1996). In Austria, Hofer and Lietz (2004) found that apprentice graduates (upper secondary level) have less unemployment and higher earnings than unskilled workers, although their labour market performance is weaker than that of upper secondary graduates.<sup>10</sup>

#### **Box 4.6 Workplace training in Korea**

In Korea, many companies complain that young people entering employment directly after school require considerable training before they start a job (Grubb et al., 2006; Jung et al., 2004). According to a survey carried out by the Korea Employers Federation (KEF, 2005 in Park, 2007) among 536 companies (100 workers and over), new university graduates typically need more than 20 months of training before they are placed in a real work situation at a total cost of approximately KRW 107 million in large companies and KRW 39 million in SMEs (Park, 2007). Jung et al. (2004) argue that the low availability of workplace training in Korea forces students to seek costly additional training from private providers.

The Youth Job Experience programmes involve practical training in firms for students and unemployed 15-to-29-year-olds, with tertiary students accounting for 83% of all participants. Evaluation of the programme shows that student participants needed less time to find a job after graduation and stayed longer in their first jobs than those without work experience during their studies (OECD, 2007). However the programme reached relatively few students and participation has been decreasing (MEHRD and KEDI, 2005; OECD, 2007).

In the light of these circumstances, the OECD review of VET in Korea recommends improvement in the provision and quality of initial workplace training (Kuczera, Kis and Wurzburg, 2009).

<sup>9</sup> Based on data for the 1984-90 sample.

<sup>10</sup> The study does not control for students' ability and selection mechanisms.

Dropout is one indicator of weakness in apprenticeship systems as well as perhaps the attractiveness of alternative career options. Dropout rates are technically difficult to calculate, mainly because in most educational systems, a proportion of those who leave educational programmes re-enter a similar programme either immediately or within a relatively short period of time. This group may not be regarded as genuine dropouts. This means that comparing dropout rates across countries is fraught with difficulty, but there are some striking international differences. A recent study sought to identify comparable completion rates for a group of European countries. They note a completion rate of 31% for England<sup>11</sup>, 50-60% in Scotland, and suggest, that on a comparable basis, the rate in Germany is around 75%, around 70% in Denmark, around 65-70% in the Netherlands, and around 75-80% in France. The study notes a range of statistical difficulties associated with this comparison (West, 2004). In practice non-completion may not be a significant problem. Among other studies on apprenticeship dropout, Bessey and Backes-Gellner (2007) show that in Germany about 20% of the apprentices prematurely terminate their apprenticeship contract, but in practice most of them either shift to another employer or education career track, leaving only a very small proportion of complete drop-outs – less than 5% of those who start apprenticeships.

#### 4.4 Taking advantage of workplace training: conclusion

##### *Arguments and evidence*

- Good quality workplace training:
  - Provides a strong learning environment for both hard and soft skills.
  - Improves transition from school to work by allowing employers and potential employees to get to know each other.
  - Contributes to output.
  - Links the provision of training to real labour market needs.
- Workplace training typically needs to be complemented by other education and training, since some skills are more effectively taught off the job and workplace training may not always be available because of regional economic weaknesses or economic downturns.
- The ideal apprenticeship training will be:
  - High quality, with well-structured training in the workplace.
  - Attractive to a wide range of employers in terms of the costs relative to immediate and potential benefits.
  - Relevant and attractive to apprentices with a low dropout rate, and an adequate wage.
  - Cost-effective, relative to alternative ways of delivering publicly supported VET.

<sup>11</sup> Completion rates in England have risen substantially in recent years, rising from 38% in 2004/5 to 64% in 2007/08. Data Service (2008) Statistical First Release DS/SFR1 v2 22 December 2008, the Data Service, London.

### **Workplace training: OECD recommendations**

- Make substantial use of workplace training in initial VET.
- Ensure that the framework for workplace training encourages participation by both employers and students.
- Ensure workplace training is of good quality, through the provision of a clear contractual framework for apprenticeships, and through an effective quality assurance system.
- Balance workplace training by other provision (*e.g.* training workshops in schools) where other learning environments work better, or where workplace training is not available.
- Devise effective responses to the current economic crisis, to sustain workplace training, and cope with increased demand for full-time VET.

## References

- Acemoglu, D., and J. Pischke (1999a), “The Structure of Wages and Investment in General Training”, *Journal of Political Economy*, Vol. 107, No. 3, pp. 539-572.
- Acemoglu, D. and J. Pischke (1999b), “Beyond Becker: Training in Imperfect Labour Markets”, *The Economic Journal*, Vol. 109, No. 453, pp. 112-142.
- Acemoglu, D. and J. Pischke (1998), “Why do Firms Train? Theory and Evidence”, *Quarterly Journal of Economics*, Vol. 113, No. 1, pp. 79-118.
- Aarkrog, V. (2005), “Learning in the Workplace and the Significance of School-based Education: A Study of Learning in a Danish Vocational Education and Training Programme”, *International Journal of Lifelong Education*, Vol. 24, No. 2, March-April 2005, pp. 137-147, Routledge.
- Askilden, J. E. and N.A. Øivind (2005), “Apprentices and Young Workers: A Study of the Norwegian Youth Labour Market”, *Scottish Journal of Political Economy*, Vol. 52, No. 1, pp. 1-17.
- Australian Fair Pay Commission (2006), “Minimum Wage Decision October 2006”, [www.fairpay.gov.au/fairpay/WageSettingDecisions/General/2006/FactSheets/2006MinimumWageDecision.htm](http://www.fairpay.gov.au/fairpay/WageSettingDecisions/General/2006/FactSheets/2006MinimumWageDecision.htm)
- Autor, D. (2001), “Wiring the Labor Market”, *Journal of Economic Perspectives*, Vol. 15, No. 1, pp. 25-40.
- Bassanini, A., and G. Brunello (2008), “Is Training More Frequent When Wage Compression is Higher? Evidence from the European Community Household Panel”, *Labour Economics*, Vol. 15, No. 2, pp. 272-290.
- Beicht, U., G. Walden and H. Herget (2004), *Kosten und Nutzen der betrieblichen Berufsausbildung in Deutschland*, Bertelsmann, Bielefeld.
- Bessey, D. and U. Backes-Gellner (2007), “Premature Apprenticeship Terminations: An Economic Analysis”, Working Paper No.2 Institute for Strategy and Business and Economics and Swiss Leading House Economic of Education. Firm Behavior and Training Policies, Zürich.
- Billett, S. and A. Smith (2005), “Encouraging enterprises' expenditure on VET: Policy goals and mechanisms”, *Journal of Vocational Education and Training*, Vol. 57, No. 1, pp. 5-23.
- Brunello, G. (2009), *The Effect of Economic Downturns on Apprenticeships and Initial Workplace Training: a Review of the Evidence*, OECD. Available at: ([www.oecd.org/dataoecd/51/41/43141035.pdf](http://www.oecd.org/dataoecd/51/41/43141035.pdf))
- CEDEFOP (2008), *Social Partners and Sectoral Training Funds: Mobilising Resources*, Briefing Note, CEDEFOP, Thessaloniki.

- Clark, D. (2001), “Why do German Firms Subsidize Apprenticeship Training? Test of Asymmetric Information and Mobility Cost Explanations” *Vierteljahreshefte für Wirtschaftsforschung*, No. 70, pp. 102-106.
- Cornford, I. and D. Gunn (1998), “Work-based Learning of Commercial Cookery Apprentices in the New South Wales Hospitality Industry”, *Journal of Vocational Education and Training*, Vol. 50, No. 4, pp. 549-568.
- Dar, A., S. Canagarajah and P. Murphy (2003), *Training Levies: Rationale and Evidence from Evaluations*, The World Bank, Washington.
- Davidson, J., C. Doucouliagos, J. Macneil, M. Rimmer, P. Sgro and L. Watts (1997), *Return on Training Investment*, Office of Technical and Further Education–ANTA, Canberra.
- Dionisius, R., *et al.* (2008), “Cost and Benefit of Apprenticeship Training – A Comparison of Germany and Switzerland”, Discussion Paper, No. 3465, IZA, Bonn.
- Edwards, C. (1997), State Failure or Market Failure? The Ten Steps to a Levy-Grant System of Vocational Training, in Godfrey, M. (ed). (1997) *Skill Development for International Competitiveness*, Edward Elgar, Cheltenham.
- Ellström, P. (2001), “Integrating Learning and Work: Problems and Prospects”, *Human Resource Development Quarterly*, Vol. 12, No. 4, pp. 421-435.
- Federal Office for Professional Education and Technology, 2008, *Vocational and Professional Education and Training in Switzerland*. National report from Switzerland contributing to the OECD’s review of “learning for jobs” Federal Office for Professional Education and Technology, Bern.
- Franz, W. and D. Soskice (1995), “The German Apprenticeship System” in *Institutional Frameworks and Labor Market Performance: Comparative Views on the U.S. and German Economies*, F. Buttler (ed.), Routledge, London, pp 208-234.
- Gasskov, V. (2003), Financing Enterprise Training by Payroll Levies, in D. Dohmen and B. Cleuvers, *Finanzierung von Weiterbildung und lebenslangem Lernen* (pp. 133-158), Bertelsmann, Bielefeld.
- Gasskov, V. (1998), “Levies, Leave and Collective Agreements Incentives for Enterprises and Individuals to Invest in Training”, *Vocational Training*, No. 13, pp. 27-34.
- Gibb, J. (1999), “The Quality of Learning”, *Australian Training Review*, No. 32 (Oct/Nov/Dec), pp. 32-33.
- Goux, D., and E. Maurin (1997), *Train or Pay: Does It Reduce Inequalities to Encourage Firms to Train their Workers?*, INSEE, Paris.
- Grubb, N., *et al.* (2006), Thematic Review of Tertiary Education, Country Note, OECD, [www.oecd.org/dataoecd/37/21/38092630.pdf](http://www.oecd.org/dataoecd/37/21/38092630.pdf).
- Gruber, E., I. Mandl and T. Oberholzner (2008), *Learning at the Workplace*, CEDEFOP, Tessaloniki.
- Harris, R., M. Simons and J. Bone (2000), *More than Meets the Eye? Rethinking the Role of Workplace Trainer*, NCVER, Brisbane.
- Hart, R. (2005), “General Human Capital and Employment Adjustment in the Great Depression: Apprentices and Journeymen in UK Engineering”, *Oxford Economic Papers*, No. 57, pp. 169-189.

- Hawke, G. (1998), “Learning, workplaces and public policy” in J. McIntyre and M. Barrett (eds.), *VET Research: Influencing Policy and Practice*, proceedings of the first national conference of the Australian Vocational Education and Training Research Association, Sydney.
- Hofer, H. and C. Lietz (2004), “Labour Market Effects of Apprenticeship Training in Austria”, *International Journal of Manpower*, Vol. 25, No. 1, Emerald.
- Hungarian Ministry of Labour and Social Affairs (2008), personal communication.
- Jung, T.H. et al. (2004), *Effective Measures for School-to-work Transition in the Vocational Education System. Lessons from Australia and Korea*, NCVER, Adelaide.
- Kilpatrick, S., V. Hamilton and I. Falk (2001), *Issues of Quality Learning: Apprenticeship in Rural and Remote Australia*, CRLRA, Sydney.
- Kis, V., K. Hoeckel and P. Santiago (2009), *Learning for Jobs: OECD Reviews of Vocational Education and Training: Mexico*, OECD, Paris. Available at: ([www.oecd.org/dataoecd/28/37/43277304.pdf](http://www.oecd.org/dataoecd/28/37/43277304.pdf))
- Köpeczi Bócz, T. and E. Bükki (2006a), *A szakképzés Magyarországon* (Vocational Education and Training in Hungary), CEDEFOP, Thessaloniki.
- Korean Employers Federation (KEF) (2005), *Daejol Sinipsawon Jaegyoyook Hyonhwang Josa* (Survey on Re-education of Newly Recruited University Graduates), KEF, Seoul.
- Kuczera, M., S. Field., N. Hoffman, S. Wolter (2008a), *Learning for Jobs: OECD Reviews of Vocational Education and Training: Sweden*, OECD, Paris. Available at: ([www.oecd.org/dataoecd/26/55/40755122.pdf](http://www.oecd.org/dataoecd/26/55/40755122.pdf))
- Kuczera, M, G. Brunello, S. Field and N. Hoffman (2008b), *Learning for Jobs: OECD Reviews of Vocational Education and Training: Norway*, OECD, Paris. Available at: ([www.oecd.org/dataoecd/45/34/41506628.pdf](http://www.oecd.org/dataoecd/45/34/41506628.pdf))
- Kuczera, M., V. Kis, and G. Wurzburg. (2009), *Learning for Jobs: OECD Reviews of Vocational Education and Training: Korea*, OECD, Paris. Available at: ([www.oecd.org/dataoecd/53/49/42689417.pdf](http://www.oecd.org/dataoecd/53/49/42689417.pdf))
- Lasonen, J. (2005), “Workplace as Learning Environments: Assessments by Young People after Transition from School to Work”, [www.bwpat.de/7eu](http://www.bwpat.de/7eu) .
- Lee, K. W. (2006), “Effectiveness of Government's Occupational Skills Development Strategies for Small- and Medium-scale Enterprises: A Case Study of Korea”, *International Journal of Educational Development*, Vol. 26.
- Leuven, E. (2005), “The Economics of Private Sector Training: A Survey of the Literature”, *Journal of Economic Surveys*, Vol. 19, No. 1, pp. 91-111.
- Ministry of Education & Human Resources Development (MEHRD) and Korean Educational Development Institute (KEDI) (2005), “Brief Statistics on Korean Education, 2005”, *Statistical Materials 2005-4*.
- Mohrenweiser, J. and U. Backes-Gellner (2006), *Distinguishing Companies with Different Apprenticeship Training Motivations – Evidence from German Establishment Data*, Working Paper No.7, Universität Zürich, Zürich.
- Mohrenweiser, J. and T. Zwick (2008), *Why do Firms Train Apprentices? The Net Costs Puzzle Reconsidered*, ZEW, Mannheim.

- Mühlemann, S., J. Schweri, R. Winkelmann and S. Wolter (2007), “An Empirical Analysis of the Decision to Train Apprentices”, *Labour: Review of Labour Economics and Industrial Relations*, Vol 21, No. 3, pp. 419-441.
- Neubäumer, R. and L. Bellmann (1999), “Ausbildungsintensität und Ausbildungsbeteiligung von Betrieben: Theoretische Erklärungen und empirische Ergebnisse auf der Basis des IAB-Betriebspanels 1997” in *Die wirtschaftlichen Folgen von Aus- und Weiterbildung*, W. Sesselmeier (ed.), Hampp Verlag, Munich, pp. 9-41.
- Norwegian Directorate for Education and Training (2008), “Responses to the National Questionnaire”, unpublished.
- OECD (2007), *Jobs for Youth: Korea*, OECD, Paris.
- OPET (2008), *Resultate Evaluation Lehrbetriebsverbände*, OPET, Bern.
- Park, I. (2007), “The Labour Market, Skill Formation and Training in the ‘Postdevelopmental State’: The Example of South Korea”, *Journal of Education and Work*, Vol. 20, No. 5, pp. 417-435, Taylor and Francis.
- Rauner, F. (2007), *Kosten, Nutzen und Qualität der beruflichen Ausbildung*, Bremen University, Bremen.
- Richardson, S. (2005), New estimates of Employers’ Contributions to Training, in K. Ball, *Funding and Financing of Vocational Education and Training, Research readings*, NCVER, Adelaide.
- Robertson, I., M. Harford, A. Strickland, M. Simons, R. Harris and A. Edwards (2000), *Evaluating On- and Off-Job Approaches to Learning and Assessment in Apprenticeships and Traineeships*, Post Compulsory Education and Training Conference, Gold Coast.
- Ryan, P. (2000), “The Institutional Requirements of Apprenticeship: Evidence from Smaller EU Countries”, *International Journal of Training and Development*, Vol. 4, No. 1, Blackwell.
- Schofield, K. (1999), *Independent Investigation into the Quality of Training in Queensland's Traineeship System*, Department of Employment, Training and Industrial Relations, Queensland.
- Schweri, J., et al. (2003), *Kosten und Nutzen der Lehrlingsausbildung aus der Sicht Schweizer Betriebe*, Beiträge zur Bildungsökonomie, Band 2, Rüegger Verlag, Chur and Zurich.
- Seagraves, L. and M. Osborne (1997), “Participants in a Work-based Learning Programme: Small and Medium Enterprises and their Employees” in *Good Thinking: Good Practice – Research Perspectives on Learning and Work*, 5th Annual International Conference on Post-compulsory Education and Training, Griffith University, Brisbane.
- Smith, A., and S. Billett (2005), Getting Employers to Spend More on Training: Lessons from Overseas. In K. Ball, *Funding and Financing of Vocational Education and Training*, NCVER, Adelaide.
- Smits, W. (2006), “The Quality of Apprenticeship Training”, *Education Economics*, Vol. 14, No. 3 pp. 329-344, Routledge.

- Vallence, K. (1997), “Training one-to-one: Out of sight, out of mind” in *Good Thinking: Good practice – Research Perspectives on Learning and Work*, 5th Annual International Conference on Post-compulsory Education and Training, Griffith University, Brisbane.
- Van den Berg, N., F. Meijers and M. Sprengers (2006), “More Vocational Education and Supplementary Training through Equalisation of Costs? An Analysis of a Training and Development Fund in the Netherlands”, *Human Resource Development International*, Vol. 9, No. 1, pp. 5-24.
- Wacker, K. (2007), *Teure neue Lehrstelle Eine Untersuchung zur Effizienz des Blum-Bonus*, NÖAK, Vienna.  
([http://noe.arbeiterkammer.at/bilder/d57/lehrstellenmarkt\\_studie.pdf](http://noe.arbeiterkammer.at/bilder/d57/lehrstellenmarkt_studie.pdf))
- West, J. (2004), *Improving Completion Rates in Apprenticeship: a Comparative and Numerical Approach* Apprenticeship Task Force, London.  
([www.employersforapprentices.gov.uk/docs/.../Research\\_1\\_309.doc](http://www.employersforapprentices.gov.uk/docs/.../Research_1_309.doc))
- Westergaard-Nielsen, N. and A. Rasmussen (1999), *The Impact of Subsidies on Apprenticeship Training*, Centre for Labour Market and Social Research, Aarhus.
- Winkelmann, R. (1996), “Employment Prospects and Skill Acquisition of Apprenticeship – Trained Workers in Germany”, *Industrial and Labour Relations Review*, Vol. 49, No. 4, pp. 658-672, JSTOR.
- Woerkom, M., W. Nijhof and L. Nieuwenhuis (2002), “Critical Reflective Working Behaviour: a Survey Research”, *Journal of European Industrial Training*, Vol. 26, No. 8, pp. 375-383.
- Wolter, S. and J. Schweri (2002), “The Cost and Benefit of Apprenticeship Training: The Swiss Case”, *Applied Economics Quarterly*, Vol. 48, No. 3-4, pp. 13-25.

