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Does work-based learning facilitate transitions to decent work?

Paul Comyn
Laura Brewer

Employment
and Labour
Market Policies
Branch



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Foreword

Across the globe, young women and men are making an important contribution as productive workers, entrepreneurs, consumers, citizens, members of society and agents of change. All too often, the full potential of young people is not realized because they do not have access to productive and decent jobs. Although they are an asset, many young people face high levels of economic and social uncertainty. A difficult transition into the world of work has long-lasting consequences not only for youth but also for their families and communities.

The International Labour Office has long been active in youth employment, through its normative action and technical assistance to member States. One of the means of action of its Youth Employment Programme (YEP) revolves around building and disseminating knowledge on emerging issues and innovative approaches.

In 2012, the International Labour Conference issued a resolution with a call for action to tackle the unprecedented youth employment crisis through a set of policy measures. The resolution provides guiding principles and a package of interrelated policies for countries wanting to take immediate and targeted action to address the crisis of youth labour markets. This paper is part of follow-up action on knowledge building coordinated by Niall O'Higgins of the YEP. It is one of three analyses of internship and other forms of work-based learning (WBL) developed in collaboration with the SKILLS branch and the LABOURLAW unit of the ILO.

In the current global context of complex economic challenges, skills and employability have emerged as areas of high priority for policy-makers. A key goal for technical and vocational education and training (TVET) and skills systems is ensuring that learners are ready to enter work and possess skills relevant to the labour market, and a strategy commonly adopted by countries in pursuit of this goal has been to incorporate WBL into education and training programmes. Work-based learning, which takes many forms and is known by a variety of names, provides learners with exposure to real work environments and, when delivered effectively, allows for strong pedagogical links between the development of knowledge and of practical skills. Exposure to authentic work contexts also contributes to the exploration and development of occupational identity, which cannot be achieved through programmes that are delivered only in education and training institutions. Nevertheless, it remains a challenge for many education and training institutions to effectively incorporate WBL into their programme offerings. In this context, the need for more effective WBL practices has become increasingly evident.

This working paper examines the different forms of WBL currently in operation, and takes stock of available data on the labour market impact of such schemes. It considers structured apprenticeships, internships, traineeships and other programmes that include a WBL component. The paper finds evidence of positive impacts of formal, structured WBL, and argues that future efforts should encourage engagement with private-sector firms in creating and expanding such structured opportunities for young people.

The paper was prepared by Paul Comyn and Laura Brewer of the Skills and Employability Branch of the Employment Policy Department of the ILO in consultation with Niall O'Higgins (YEP). Sinali Rumanthi Perera provided research assistance, Gillian Somerscales edited and Mariela Dyrberg formatted the paper; the excellent work of all of them is gratefully acknowledged.

Srinivas B. Reddy
Chief
Skills and Employability Branch

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Abbreviation

ADB	Asian Development Bank
CEDEFOP	European Centre for the Development of Vocational Training
ETF	European Training Foundation
EC	European Commission
EU	European Union
EAG-TVET	Inter-Agency Group for Technical and Vocational Education and Training
ISCED	International Standard Classification of Education
NACE	National Association of Colleges and Employers (US)
OECD	Organisation for Economic Co-operation and Development
SWTS	School to Work Transition Surveys
TVET	Technical and vocational education and training
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
VET	Vocational education and training
WBL	work-based learning
WHO	World Health Organization
YEP	Youth Employment Programme

1. Introduction

There is growing interest in how workplaces develop and use skills, and in how programmes integrating WBL can be delivered across a range of educational settings. For example, WBL has been chosen by the 28 European Union (EU) Member States as one of their top priorities for 2020 (IAG-TVET, 2017), and at the international level the Inter-Agency Group on Technical and Vocational Education and Training (IAG-TVET), involving a number of international and multilateral organizations,¹, has identified WBL as a priority area for joint work in 2018. These commitments reflect a wider interest in WBL. In its 2012 resolution on the youth employment crisis, the tripartite constituents of the 187 ILO member States called on governments to “improv[e] the range and types of apprenticeships by: (i) complementing learning at the workplace with more structured institutional learning; (ii) upgrading the training skills of master craftspersons and trainers overseeing the apprenticeships; (iii) including literacy training and livelihood skills; and ... [r]egulating and monitoring apprenticeship, internship and other work-experience schemes” (ILO, 2012a, p. 7). This interest, however, is not of itself a new phenomenon. Traditional skills development systems in both the formal and informal economies of the global North and South have had well-established models of WBL in place for centuries. However, in the education and training sector, “for the last ten years or more, in both developed and developing economies, the combination of work and learning in the classroom and the workplace has been an attractive, if not seductive, idea for policy-makers concerned with employment, education, vocational training and youth transitions to the world of work” (UNESCO, 2015, p. 99).

In the current global context of complex economic challenges, skills have emerged as a key priority for policy-makers. To date, governments have primarily engaged with the issue of skills from the supply side – namely, focusing on the need to improve the number of people with post-secondary academic or vocational qualifications. However, as the ILO and OECD have noted, there is an increasing recognition that policy-makers must also engage with the issue of skills from the demand side (ILO and OECD, 2017). This involves understanding the nature of the skills demanded by employers and supporting the optimal use of those competencies in the workplace. In this context, the need for more effective WBL practices has become more pressing.

Another factor contributing to the interest in WBL has been the growth of the knowledge economy and the use of high-performance work practices that are transforming the ways in which work is organized. As Sung and Ashton (2014) have observed, WBL has become increasingly important and the use of the workplace as a learning experience has been transformed. Sung and Ashton note that the shift to the knowledge economy and the use of high-performance work practices “has meant that in all organizations the workplace has become more recognized as a source of continuous learning for all employees” (p. 11). WBL is thus often seen as a powerful driver of workplace skills and productivity. However, enhancing our understanding of the role that WBL can play in facilitating the transition to decent work needs also to be recognized as a central element in policy debates surrounding the development of learning at the workplace.

¹ Members are the the Asian Development Bank (ADB), the European Centre for Research on Vocational Education (CEDEFOP), the European Commission, the European Training Foundation (ETF), the Inter-American Development Bank, the ILO, the Organisation for Economic Co-operation and Development (OECD), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Industrial Development Organization, the World Health Organization and the World Bank.

It has been suggested that this renewed interest in WBL has emerged from four main arguments, namely, that it can improve pathways to adulthood; deliver economic and labour market benefits to learners, enterprises and society more broadly; improve pedagogy; and reduce costs and increase capacity within the TVET system (Sweet, 2011). The OECD has noted that the combination of learning in the work environment and in school provides numerous advantages, enabling learners to get an education that combines practical and theoretical learning; firms to benefit from the tailoring of education to meet workplace needs; and students to become familiar with firm-specific procedures (OECD, 2016a). Consequently, the ILO has suggested, combined school and work-based programmes reduce skills mismatches and provide hiring possibilities for firms (ILO, 2017a).

Beyond the studies of existing WBL arrangements, many of which have focused on high-income countries, there is also a concern with improving and expanding WBL in low- and middle-income countries, where many young people are engaged in low-quality WBL arrangements, often below the country's minimum working age or in hazardous occupations prohibited to minors (ILO, 2012b). In the informal economy WBL, often through what are known as informal apprenticeships, is the predominant form of skills development; this, as noted by the Asian Development Bank (ADB, 2017), provides another clear rationale for initiatives to improve the quality and increase the quantity of WBL in developing countries. Understanding the dynamics of the costs and benefits of WBL, and ensuring that these are reflected in the design of WBL schemes, is essential to ensure that firms provide high-quality WBL and trainees perceive it as an attractive learning opportunity (OECD, 2016b).

It is apparent, then, that a range of factors exist to explain the current high levels of interest in WBL. This is the starting point for the present paper, which sets out to consider the evidence for positive labour market outcomes from programmes that involve WBL. In doing so, it presents evidence related to outcomes for employers, as well as for learners, from a range of programme types including apprenticeships, internships and other schemes that combine on- and off-the-job learning. However, before the impact of education and training programmes that include WBL can be considered, issues of definition and terminology need to be addressed.

2. What is WBL?

As the need for and interest in WBL has increased internationally, so has the lack of clarity surrounding the different types of WBL. Beyond the informal learning that employees undertake in a workplace, WBL can also be understood to include programmes that are variously known by a wide range of terms, including apprenticeships, traineeships, learnerships, work placements, work experience, cooperatives (or co-ops) and internships. This variety, coupled with the lack of a common language to describe and discuss the different programme types, means that terminology varies and what constitutes a work-based learning programme is understood differently in different countries. Table 1 shows a range of different definitions adopted by international and national organizations.

Table 1. Definitions of WBL

Organization or country	Definition of WBL
European Centre for the Development of Vocational Training (CEDEFOP) Source: EC, 2015, p. 73.	WBL is the acquisition of knowledge and skills through carrying out – and reflecting on – tasks in a vocational context, either at the workplace or in a vocational education and training (VET) institution.
Asian Development Bank (ADB) Source: ADB, 2017, pp. 6–8.	WBL takes a variety of forms and can range from highly informal and unstructured training, delivered in micro- and small enterprises, through to highly structured training in medium and large enterprises resulting in nationally recognized certification.
Australia Source: Atkinson, 2016.	WBL is learning that occurs in a real work environment through participation in work activities and interactions. It is integral to vocational education and training, because it emphasizes learning through practice in the workplace and fosters engagement with employers. WBL is embedded in the curriculum and can involve deliberate engagement with those experiences for learning purposes and the formal recognition of the competencies achieved through those experiences. Types of WBL include apprenticeships and traineeships, simulation, and placements.
European Training Foundation (ETF) Source: ETF, 2013.	WBL refers to learning that occurs through undertaking real work entailing the production of real goods and services, whether this work is paid or unpaid. It needs to be clearly distinguished from learning that takes place in enterprise-based training workshops and training classrooms. The latter is not work-based learning, but simply classroom-based learning that takes place in an enterprise rather than in an educational institution.
Canada Source: BHER and Academica, 2015, p. 4.	Work-integrated learning/WBL: the term “work-integrated learning” is often used interchangeably with other, similar terms such as “work-based learning”, “practice-based learning”, “work-related learning”, etc. Work-integrated learning is defined broadly as the process through which students come to learn from experiences in educational and practice settings. It includes the kinds of curriculum and pedagogic practices that can assist, provide and effectively integrate learning experiences in both settings.
New Zealand Sources: Tyler-Smith, 2012; CareersNZ, 2016.	While arriving at an agreed and appropriate definition of WBL has yet to be finally determined, the Otago Polytechnic’s approach to the model is: education conducted in, by and for the workplace, where the learner, through negotiation with employer and polytechnic, determines the nature of the curriculum; that the curriculum is situated in the learner’s workplace context; that the learner determines the order and pacing of the learning; that the method of assessment is negotiated; and that it is a learning process agreed between the learner, his or her employer and Otago Polytechnic.
South Africa Source: CHE, 2011.	WBL or “work-integrated learning” is used as an umbrella term to describe curricular, pedagogic and assessment practices, across a range of academic disciplines that integrate formal learning and workplace concerns. The term specifically describes an approach to career-focused education that includes classroom-based and workplace-based forms of learning that are appropriate for the professional qualification.

UNESCO defines the term broadly with reference to the workplace context, noting that “work-based learning refers to any form of learning or vocational training for youth and adults that occurs inside an enterprise or workplace” (UNESCO, 2015, p. 99). The ILO

recognizes the various forms of WBL by noting that together, “apprenticeships, cadetships, traineeships and internships are effective means of bridging school and the world of work for young people by making it possible for them to acquire work experience along with technical and professional training” (ILO, 2008, p. 36).

In an attempt to synthesize the different perspectives of a number of international organizations, the Inter-Agency Group for TVET has defined WBL as “all forms of learning that takes place in a real work environment. It provides individuals with the skills needed to successfully obtain and keep jobs and progress in their professional development” (IAG-TVET, 2017, p. 2). The phrase “real work environments” is understood to allow for simulated work environments to be included in the scope of WBL on the basis that they can reproduce workplace conditions when effectively used.

It is clear that the terminology surrounding WBL is a complicating factor in any attempt to compare different types of WBL programmes and the labour market outcomes they deliver. Given the wide range of programmes that might be considered to represent forms of WBL, it is not surprising that a number of typologies can be found in the literature.

2.1 WBL scheme typologies

The ILO has proposed an approach based on three key elements to differentiate between schemes (ILO, 2017b). These are:

- whether a contract exists between an employer and a learner for the duration of the scheme;²
- whether the outcomes of the scheme are recognized through some form of official certification;³ and
- whether the training is delivered on the job, off the job or through a combination of the two.⁴

Taken in combination, the three differentiating elements produce a schema of seven different forms of WBL identifiable in practice:

1. contract based, outcomes recognized, on- and off-the-job training;
2. contract based, outcomes recognized, on-the-job training;
3. contract based, outcomes not recognized, on-the-job training;
4. non-contract based, outcomes recognized, on- and off-the-job training;
5. non-contract based, outcomes not recognized, on-the-job training;
6. non-contract based, outcomes not recognized, off-the-job training;
7. non-contract based, outcomes recognized, off-the-job training.

Table 2 provides an overview of these types with national examples to show how different countries use different terms to describe similar schemes.

² A written contract that sets out the terms and duration of engagement or employment, including remuneration if any, and details of the nature of training to be undertaken. This recognizes that learners can be classified as employees or not depending on national law.

³ Including recognition by government and/or awarding bodies including education and training institutions and industry/professional organizations.

⁴ Off-the-job training includes training delivered in a classroom setting in a workplace.

Table 2. Typology of WBL schemes

Type	Contractual status	Recognition	Training modality	National examples
1.	Yes	Yes	On and off the job	Apprenticeship (Germany) Traineeship (Australia)
2.	Yes	Yes	On the job	Apprenticeship (Italy) Traineeship (Europe)
3.	Yes	No	On the job	Apprenticeship (Chile) Internship (UK)
4.	No	Yes	On and off the job	Apprenticeship (Turkey) Learnership (South Africa)
5.	No	No	On the job	Internship (US)
6.	No	No	Off the job	Practice firm (Europe)
7.	No	Yes	Off the job	Teaching factory (Indonesia)

In a simpler approach, shown in figure 1 here, the ADB has identified four stages of learning in the workplace, primarily reflecting the level of formality and structure of each stage.

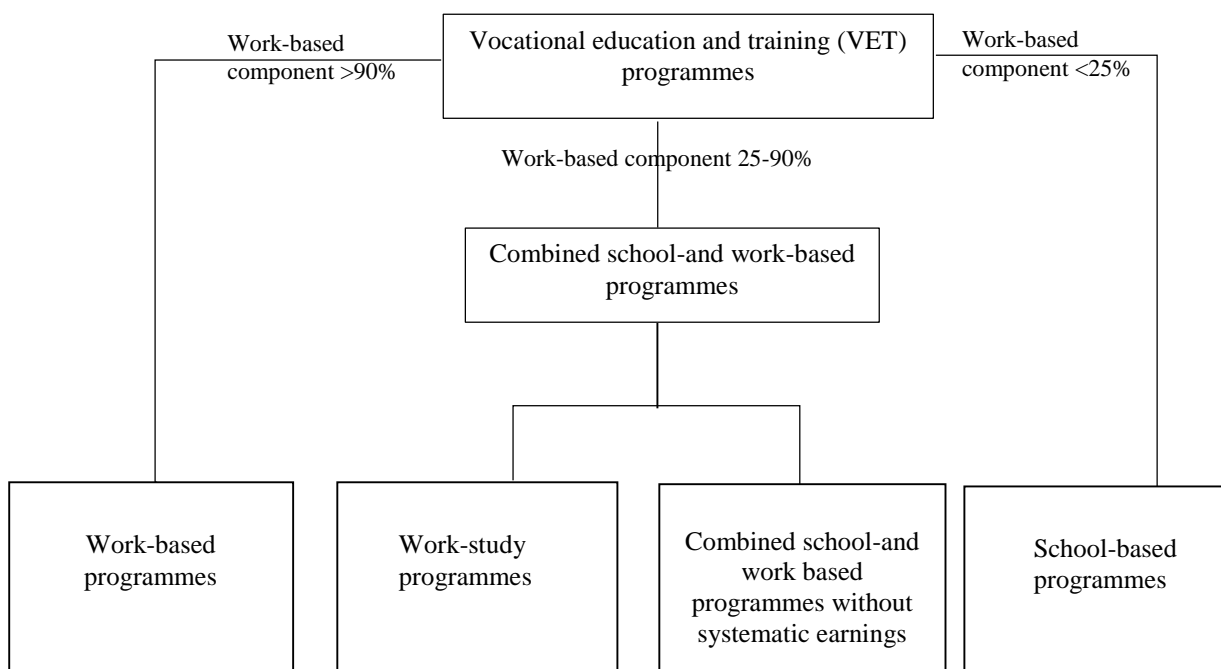
Figure 1. Forms of WBL



Source: ADB, 2017

The OECD has distinguished three types of WBL, namely: structured; informal or non-formal; and work placement (Kis, 2016). It has also considered the definition in terms of the proportion of the programme spent in an institution or a workplace, and whether or not earnings are obtained (OECD, 2016c). Figure 2 shows an OECD classification of programmes into four different types that combine school-based learning and WBL to varying degrees. Within this schema, work–study programmes are defined as formal education and training programmes combining interrelated study and work periods for which the student/trainee receives earnings (OECD, 2016c). However, the definition of combined school- and work-based programmes without systematic earnings in figure 2 below includes apprenticeship programmes, which in many countries do involve the payment of wages or other forms of remuneration.

Figure 2. Taxonomy of formal vocational education and training (VET) programmes



Source: OECD, 2016c.

These different typologies highlight the challenges of classifying WBL programmes and show that how such programmes are classified can highlight different factors, including:

- how the programme is structured and whether certification (formal, informal, or non-formal, recognized) is obtained;
- whether earnings of some form (wages, stipends, allowances) are received;
- whether a contract or some form of agreement exists between the parties involved; and
- consideration of what shares of learning occur respectively in the workplace or in a learning institution.

Given the variety of approaches to defining and classifying WBL, for the purposes of this paper we take a broad definition which recognizes WBL programmes as **those which include the process of undertaking and reflecting on productive work in real workplaces, paid or unpaid, and which may or may not lead to formal certification.** We also recognize that detailed data and information on the labour market impact of the different types of WBL programmes, on which any analysis of the relative impacts achieved by these types of programmes must be based, are limited.

In the next section of the paper, we move on to present findings from the literature on the different labour market outcomes of schemes that integrate work and learning in some of the various forms described in table 2. Where the data permit, these outcomes are considered from the perspectives of learners, enterprises and society more broadly.

3. Measuring the labour market impact of WBL schemes

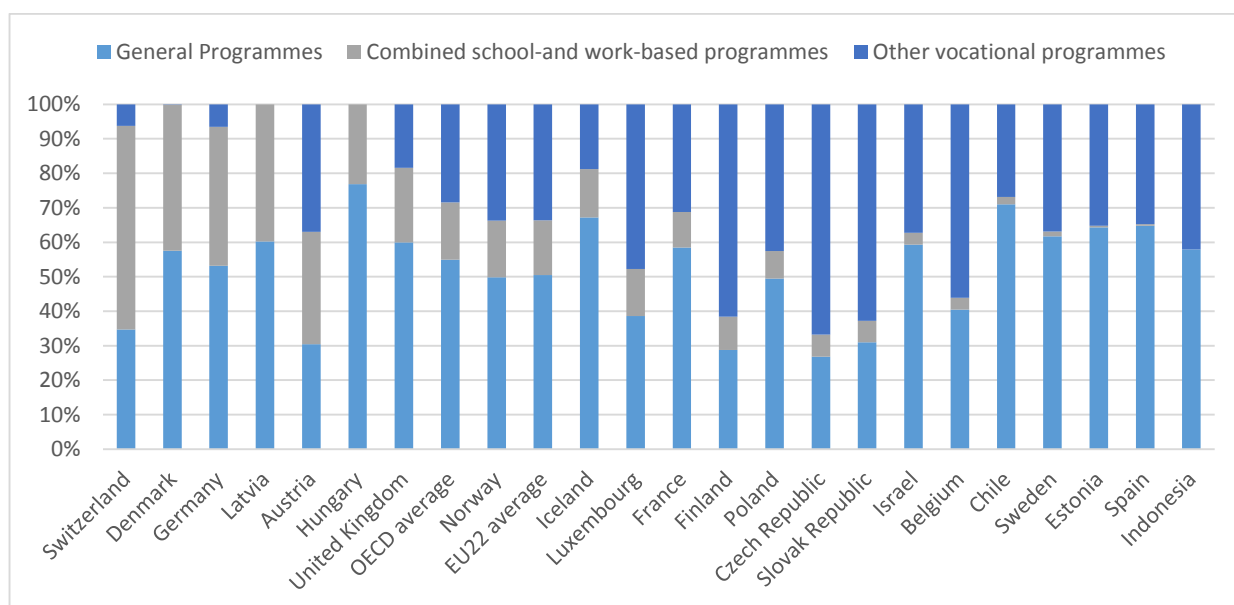
3.1 The prevalence of WBL

Before considering the labour market impact of programmes with a WBL component, to the extent possible, it is worth considering the prevalence of these types of programmes compared to that of schemes that do not have a component of workplace learning.

This itself is not a straightforward exercise. In Australia, for example, it has been noted that “neither VET nor the university sector have a comprehensive stocktake of the work-based provisions and work-integrated learning available in different disciplines and among different education and training providers, possibly because they occur in diverse ways and forms and are not easily enumerated or compared” (Atkinson, 2016, p. 5).

In relation to formal programmes within the education and training system that lead to formal certification, data do exist from various sources including the EU, the OECD and UNESCO. Even here, however, there are measurement and definitional challenges. The measurement challenge is reflected in recent efforts by the OECD to ascertain the prevalence of WBL programmes through a pilot study in 2016. In its report (OECD, 2016c), the OECD notes that while the importance and structure of TVET systems vary widely across countries, it is possible, on the basis of combined enrolment data collected by EUROSTAT, the OECD and UNESCO, and the respective enrolment rates in VET programmes at ISCED 3,⁵ to identify the share of programmes with a WBL component in the TVET systems of a number of countries (see figure 3). However, as we will see in the subsequent sections, the available data are heavily skewed towards Europe, OECD countries and the United States.

Figure 3. Prevalence of WBL programmes



Source: based on OECD, 2017, table C1.3.

⁵ Upper secondary education (ISCED 3) corresponds to the final stage of secondary education in most OECD countries. Programmes at level 3 can be further divided into three categories: general, pre-vocational/pre-technical, and vocational or technical programmes.

These results show that a significant presence of formal programmes including WBL exists in only a small number of countries. In Austria, Denmark, Germany, Hungary, Latvia and Switzerland, significant percentages of students are enrolled in combined school- and work-based programmes. In only Denmark and Latvia do relatively large shares of the two main different types of VET programmes coexist. Consequently, despite the growth of apprenticeships, internships and work experience programmes outside general education, the extent of formal WBL programmes in TVET systems remains relatively small. Given the definitional issues surrounding WBL and the fact that such programmes exist both in formal education and training systems and in the open market, it is not possible to accurately judge the prevalence of WBL schemes in their entirety. In the sections that follow, therefore, we will examine in turn the major commonly recognized types of WBL programmes, beginning with the most highly structured and well-known type – apprenticeships.

3.2 Apprenticeships – impact on learners

It is worth noting here that the discussion that follows does not encompass informal apprenticeships, which typically do not include a programme of institutional learning, are not regulated by laws, and do not involve a written contract between the apprentice and the master craftsperson (for further information, see e.g. ILO, 2012b, which presents a discussion on the nature and scope of informal apprenticeships in Africa).

While there are both costs and benefits of formal apprenticeship programmes, depending on the duration and type of programme, the literature suggests that benefits to both enterprises and learners in most cases exceed the costs (Hauschildt, 2017). Although apprentices may receive discounted wages while in training and contribute to other upfront costs such as uniforms or tools, the ensuing improvements in employment chances, earnings, satisfaction in working life and long-term mobility in the labour market make up for these initial drawbacks.

There is a general consensus in the economic research that registered apprenticeship programmes have positive impacts on personal economic benefits and school-to-work transitions (Lodovici et al., 2013). The ILO has also noted that young people in countries that make widespread use of apprenticeship programmes are more successful at making the transition into the labour market (ILO, 2017a). In addition, compared to associate degree programmes in universities at the same level, apprenticeship programmes have been found to increase the probability of having a job in France, Germany, Switzerland and the United Kingdom (Bertschy, Cattaneo and Wolter, 2009; Ryan, 1998, 2000).

While the wages or allowances paid to apprentices are lower than the wages of fully fledged workers, they are likely to be higher than the typical income of other young people of the same age studying in TVET institutions and/or universities. However, it is difficult to determine the cost to apprentices of undertaking an apprenticeship, because the opportunity costs (i.e. the forgone income which the apprentice would have earned if he/she had not participated in the apprenticeship) are difficult to identify (Hauschildt, 2017).

Apprentices also derive financial benefit in the form of future earnings, as there is evidence that apprentices go on to earn more than other TVET students. The Netherlands provides a useful point of reference here, as Dutch apprentices and TVET students obtain the same qualification through different learning pathways. The average gross hourly wage for entry-level jobs for apprentices at level 4 in the Dutch system stood at €13.40 over the period 2009–13, but was only €10.05 for TVET students who earned the same qualification through a different learning pathway (Ministry of Education, Culture and Science, 2013, p. 76). These figures on differentials in pay are echoed in an American study which found that, six years after enrolment, former apprentices were earning US\$6,595 a year more than their contemporaries who had not been apprentices (Reed et al., 2012). In the United Kingdom, a

young worker with an apprenticeship can expect a wage premium of 43.6 per cent relative to a comparable worker without an apprenticeship (CEBR, 2013). The same American study also estimated that, over the whole of their careers, apprentices who completed their apprenticeships would earn US\$240,037 (US\$301,533 including benefits) more than workers in similar positions who had not done an apprenticeship (Reed et al., 2012, cited in Ayres, 2014).

For the United States, the Mathematica study carried out for the US Department of Labor Employment and Training Administration (Reed et al., 2012) is one of the most influential and comprehensive recent research reports on registered apprentices. The study performed a cost–benefit analysis of registered apprenticeship programmes in ten states that differed in respect of labour market characteristics (including usage of apprenticeship programmes), region and level of unionization. The analysis found that all participants in registered apprenticeship programmes have substantially higher earnings than non-participants, even if they do not complete the programme, earning on average US\$123,906 more in wages and fringe benefits over the course of their careers (Reed et al., 2012).

Apprenticeship training is particularly important to the construction industry in America; it has been argued that apprenticeship training makes construction workers safer and more productive, and creates stable middle-class jobs in an otherwise turbulent labour market (Philips, 2015). Each new building, industrial facility, road, dam or sewage system “is in many ways a unique, one-of-a-kind, distinctive project” (ibid., p. 5) that construction workers need to know how to evaluate and build. In addition, construction is the most dangerous major industry in the United States. Investment in training and skill upgrading translates into fewer workplace injuries and fewer job interruptions (Bruno and Manzo, 2016). Reed et al. (2012) also found that in the construction sector in particular, apprenticeship training reduces a worker’s chances of suffering a spell of long-term unemployment (Reed et al., 2012).

A summary of research into the costs and benefits of apprenticeships was compiled by the Institute for Employment Research at the University of Warwick in the United Kingdom (Warwick University, 2012). This summary focuses on apprenticeship “earnings premiums” (the amount apprentices are paid in excess of individuals in the same jobs who had not completed apprenticeships). These premiums typically ranged from eight per cent to 22 per cent, with the higher percentages usually reflecting a longer and more advanced apprenticeship. A broader summary of apprenticeship returns focusing on Western Europe has documented similar wage premiums (Mühlemann and Wolter, 2013).

These earnings premiums translate into very high returns on investment because the apprentices are not incurring significant investment costs during their apprenticeships. While apprentices typically do invest in their own apprenticeships (for example, by forfeiting the income they could have earned in the next best alternative jobs), these investments are typically minimal. The major reason for this is that apprentices are paid a wage (often a very competitive wage) while doing their apprenticeships. Therefore, costs to the individual apprentice are low and returns on investment are typically very robust – as a simple example will demonstrate. Suppose an apprentice who has successfully completed her apprenticeship programme subsequently earns a 15 per cent wage premium over a non-apprenticed worker. Assume further that this means she earns US\$46,000 a year rather than US\$40,000. If she had to invest, say, US\$3,000 per year in her apprenticeship for four years, then by the time ten years have passed since the commencement of her apprenticeship (by which time she will have completed her sixth year of post-apprenticeship employment), she will already have realized a 25.6 per cent return on the investment she made in those first four years (Reed et al., 2012). Similar assessments in Australia found a 46.2 per cent return on investment accruing to individuals from their apprenticeships (Dockery, Norris and Stromback, 1998).

The empirical evidence, comparing the wages of former apprentices with the wages of workers with lower levels of education and no apprenticeship training, seems to be consistent in suggesting a positive effect of apprenticeship on wages (Ryan, 1998; Clark and Fahr, 2002; Fersterer, Pischke and Winter-Ebmer, 2008).

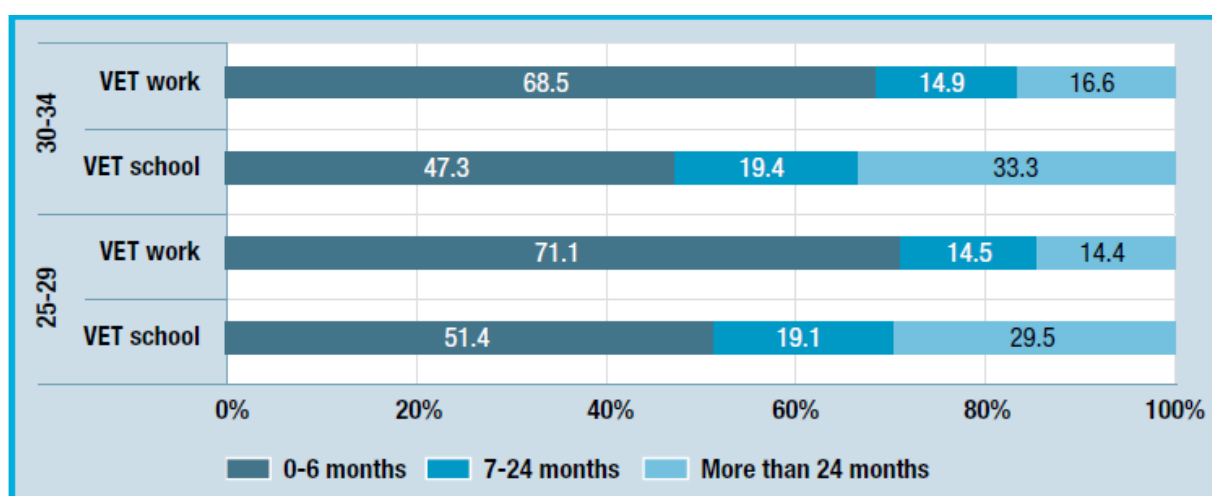
It is generally acknowledged that three different types of actor typically invest in apprenticeships: (1) the apprentices; (2) the firms or organizations sponsoring the apprenticeships; and (3) various governmental units. Separate rates of return on investment for each can be calculated in relation to the investments they make in apprenticeships.

Nearly all of the credible, rigorous economic evidence on the rate of return on investment in apprenticeships comes from Australia, Europe (especially Germany and Switzerland) and the United Kingdom, where apprenticeships have been much more common than in the United States. European studies have been stimulated by significant government investments in apprenticeship programmes, which themselves generate a keen interest on the part of governments in discovering as soon as possible whether those investments have been worthwhile (Koch, 2013).

In the empirical literature there is a general consensus on the positive effects of apprenticeships in easing the school-to-work transition. Cross-country evidence shows that in those European countries where the apprenticeship system is most developed, young people have better labour market outcomes than in other countries (ILO, 2017a; Quintini and Manfredi, 2009). Furthermore, national studies, based on individual data, provide evidence of the superiority of apprenticeships in smoothing the transition from school to work compared to school-based vocational education or entering the labour market immediately after compulsory education. Various studies show that, in addition to higher wages, apprentices achieve better job matches (Ryan, 2000), shorter periods of unemployment before finding a first job (Bonnal, Mendes and Sofer, 2002) or longer tenure in their first jobs (Bellmann, Kohaut and Lahner, 2002) compared to individuals with low educational attainment or school-based vocational education.

Data from the EU suggest that, while the transition to the labour market appears to be similar for different age groups with, respectively, school-based and work-based VET, the cumulative periods without work are shorter for graduates of workplace-based programmes (see figure 4).

Figure 4. Minimum duration of periods without employment after leaving formal education for the last time for medium-level VET graduates by type of VET and age, EU-27+, 2009



Note: EU-27+ refers to the EU including Britain in the process of Brexit.

Source: CEDEFOP, 2012, figure 22, p. 48.

Compared to school-based vocational pathways, apprenticeships tend to yield greater advantages in the early stages of the individual's working life; these advantages then decline or even disappear over the longer term (Ryan, 2000).

Differences in outcomes for apprentices are also affected by the gender, race and education level of apprentices themselves and the size of the firm where the apprenticeship is done. For example, the beneficial effects on transitions and pay seem not to hold true for women in all countries, mainly because of occupational and sectoral segregation (Ryan, 1998). Female apprentices in the United States express positive views on registered apprenticeship programmes as pathways to career advancement (Reed et al., 2012). However, women comprised only six per cent of all apprentices in the United States in 2013 (Olinsky and Ayers, 2013). Female apprentices themselves say that to increase the number of women in apprenticeship programmes, there needs to be more targeted outreach and information, more assistance with child care, and more efforts to combat harassment (Reed et al., 2012). In addition, research has shown that joint labour–management programmes administered through partnership between employers and unions have higher enrolments (and lower drop-out rates) of women and people of colour (Glover and Bilginsky, 2005).

The size of the firm hiring apprentices also appears to affect the labour market prospects of former apprentices in Germany (Bougheas and Georgellis, 2004). The positive effects of apprenticeships on labour market outcomes are also related to the quality of the apprenticeship, taking into account training intensity, duration and type, when compared to firm-specific training only (Bertschy, Cattaneo and Wolter, 2009). In Germany, moving to another firm after completing an apprenticeship was also found not necessarily to lead to a wage penalty (Euwals and Winkelmann, 2004).

The educational level and quality of apprenticeship applicants are found to influence the selection process into high- or low-level apprenticeships in Germany and Switzerland. Furthermore, in Germany previous low educational achievement is found to continue to exert a negative effect on labour market prospects, even for those individuals with poor educational results who complete a high-level apprenticeship (Büchel, 2002). On the contrary, in Switzerland, once the transition to apprenticeship is taken out of the equation (controlling for ability), apprentices with poor educational results are not penalized in the labour market once they complete apprenticeship training (Bertschy, Cattaneo and Wolter, 2009).

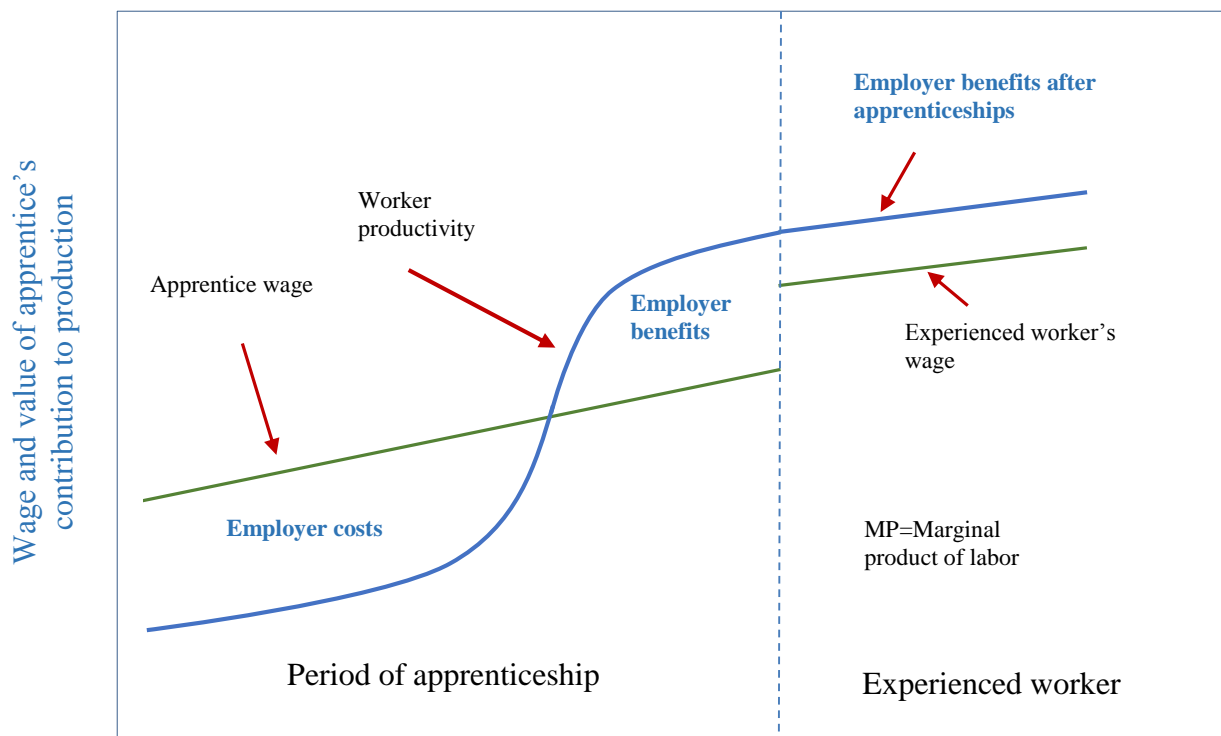
3.3 Apprenticeships – impact on employers

While understanding the return on the investments that firms make in apprenticeships is more complex than understanding the returns for individuals, and acknowledging the limitations of the data, the weight of evidence supports the notion that enterprises receive value from employing apprentices. Usually this is because the apprentice is relatively quickly put “on line” as part of the enterprise work-flow. However, as apprenticeship programmes vary in many aspects (e.g. duration, technical complexity, geographical location and the extent to which apprentices engage in work), the costs and benefits will be programme- and enterprise-specific, so any conclusions about costs and benefits overall can only be of a general nature.

Employer gains from reduced turnover, higher productivity and lower injury rates often surpass the costs of paying higher wages after training and operating the apprenticeship programme (Lodovici et al., 2013). Generally speaking, apprenticeship training represents a net cost to enterprises at the beginning because the initial costs of training (e.g. wages, social security contributions, the time of in-company mentors, training materials) outweigh the initial contribution of apprentices to the production of goods and services. As apprentices learn skills and become more productive, however, the costs and benefits begin to even out,

and employers start gradually to recover the initial investment in training, as can be seen from the stylized cost–benefit analysis during and after an apprenticeship programme presented in figure 5.

Figure 5. Costs and benefit of apprenticeships to employers



Source: Lerman, 2014, figure 1, p. 1.

Beyond the contribution of apprenticed workers to the business of the enterprise, there are other benefits that firms realize from their apprenticeship programmes, including:

- reduced recruiting costs;
- a more predictable and reliable supply of skilled labour;
- improved employee retention;
- improved employee productivity;
- enhanced social reputation;
- enhanced employee job satisfaction;
- the introduction of new ideas to the business (Hauschildt, 2017).

How significant each of these factors actually is depends heavily upon the nature of the apprenticeship occupation, external labour market conditions and the firm itself. Hauschildt (2017) has observed that a number of factors have a significant influence on the cost–benefit balance in apprenticeships:

- company size and sector;
- occupation under training;
- duration of training;
- the quality and ratio of on- and-off-the-job training;
- use of incentives and subsidies; and
- institutional framework.

It has been noted that studies measuring firm-level costs and benefits of in-company training are rare (Hauschildt, 2017). The European Commission (Lodovici et al., 2013) has observed that studies on the overall costs and benefits of apprenticeships are not widespread across EU countries because of the difficulties in calculating social costs, externalities or forgone wages from regular jobs. Large-scale and regular studies that investigate the effects of apprenticeships on firms have been conducted only in Germany and Switzerland.

When results from Germany are compared to those from Switzerland, they indicate that during the apprenticeship period German firms incur, on average, net costs while Swiss firms experience net benefits. However, the provision of apprenticeships varies across sectors, occupations and firm sizes, and empirical findings for Germany show that costs and benefits vary according to these factors. Positive effects on gross profits in the short term have been found for trade, commercial, craft and construction occupations, while firms with apprentices in manufacturing occupations face net training costs during the apprenticeship period itself, but gain by the long-term employment of former apprentices (Mohrenweiser and Zwick, 2009). It should be noted that the calculation of benefits in Germany and Switzerland does not include other benefits that accrue outside the formal apprenticeship period, such as reduced recruitment and induction costs associated with hiring that is not necessary if apprentices are employed by the company after the period of indenture is complete. In Germany more apprentices remain with their training companies after completion (50 per cent) than in Switzerland (30 per cent), reducing the need for recruitment costs and reducing the net cost over a longer time-frame (Wolter and Ryan, 2011). In relation to firm size, secondary analysis of the German firm-level data shows that smaller firms with 10–49 employees have lower training costs of €4,254 per apprentice over the course of the apprenticeship, compared with €7,354 for larger firms, indicating that net benefits accrue to smaller firms more often than they do to larger firms (Jansen et al., 2015).

However, the difference between Germany and Switzerland in apprenticeship returns for firms appears to be mainly related to the calculation of benefits rather than to costs, and can be explained by a higher share of productive tasks allocated to apprentices in Switzerland and by the differences in relative wages of apprentices compared with regular employees in both countries (Mühlemann and Wolter, 2013).

Despite the data indicating that some German firms incur net costs from their apprenticeship programmes, there remains a high and ongoing level of commitment to apprenticeships by German firms. This can be explained in part by the long-standing tradition of the scheme in Germany, but also by the higher productivity of trained apprentices during their employment. In other words, despite incurring a net cost during the period of the apprenticeship, German firms continue to strongly support apprenticeships because of the benefits that accrue over the longer term. Firms do, however, seem to vary in their motivation for supplying apprenticeship positions: for some firms apprenticeships represent a long-term investment, while for others they may represent a substitute for regular employment (Cappellari, Dell’Arling and Leonardi, 2012).

As can be seen from table 3, gross costs in Switzerland are higher, but Swiss enterprises on average obtain significantly higher benefits from training apprentices, thereby gaining a net benefit of €2,739 per apprentice over a three-year period. In Germany, on the other hand, enterprises have lower gross costs, but significantly lower benefits, thereby incurring a substantial net cost of €22,584 per apprentice over a three-year period. Moreover, 60 per cent of all training enterprises in Switzerland achieve positive net benefits, while in Germany, 93 per cent of training enterprises incur net costs (Wolter and Ryan, 2011).

Table 3. Gross and net costs to the firm of training and apprenticeship (by the end of the three-year programme) in Germany and Switzerland (€)

Country	Gross costs	Benefits
Germany	46 608	24 024
Switzerland	54 393	57 132

Source: Wolter and Ryan, 2011, table 5, p. 544.

In addition to the variables discussed earlier, three specific factors contribute to explaining this apparent paradox:

- the relative pay of apprentices (compared to the pay of skilled workers in the training occupation) is around twice as high in Germany as in Switzerland;
- when involved in production, German apprentices spend more time doing practice exercises, whereas Swiss apprentices engage in more productive work, particularly skilled tasks; and
- Swiss and German apprentices spend similar periods of time in off-the-job vocational training, but the former are present at work for longer, “as they have less vacation time, take fewer sick days, and spend less time in external and internal courses” (Wolter and Ryan, 2011, p. 544).

As noted by the ILO (2017a), firm-level studies measuring the costs and benefits of apprenticeships to employers are still rare. Outside Germany and Switzerland, the research is limited to a number of case studies conducted in the past few years, for example in the United States in 2016 (13 companies and intermediaries: USDC, 2016); India in 2014 (five company cases: Rothboeck, 2014); China in 2013 (case study of a single enterprise: Chen et al., 2013); and Viet Nam (14 cases) and South Africa in 2016 (142 company cases: Hauschildt, 2016). Despite the fact that the systemic background varies widely across these countries and various methods of calculation were applied, all of these studies suggest that there is strong evidence of a business case for apprenticeships (Hauschildt, 2017).

Beyond benefits resulting from the productive contribution of an apprentice to a company’s business while being trained, there are a number of further benefits that may or may not occur and are often also more difficult to measure. The study by Hauschildt for the ILO (Hauschildt, 2017) notes that post-training benefits mainly relate to an apprenticeship’s function as a “screening instrument” for future consideration of a skilled worker’s ability; however, from a company’s perspective, the willingness to keep a graduate apprentice on as a skilled worker strongly depends on the firm’s demand for skilled workers.

Additional benefits have been calculated by Cramer and Müller (1994, cited in Hauschildt, 2017) and Walden and Herget (2002), with more recent approaches offered by Kuczera (2017) and Mühlemann (2016). These latter approaches categorize long-term benefits as: reduced hiring costs, which comprise not only the direct costs and time involved, but also the time needed for a new worker from outside the firm to become well versed in a company’s work; firing costs (e.g. loss in productivity for workers who are to be sacked because of mismatching); and the possibility of benefiting from compressed wage structures in unregulated labour markets.⁶

⁶ The post-training benefits resulting from compressed wage structures have been described by Acemoglu and Pischke (1998). In fact, companies that undertake training have an informational advantage regarding the quality of their former apprentices compared to “outside firms” and select the better learners for job offers after training. On the external labour market, there are expected to be

Hauschildt (2017) notes that some long-term benefits are difficult to quantify. While most of the studies on costs and benefits cited so far focus on the market benefits of education and training for firms, some studies highlight the non-market benefits of apprenticeships. For example, a study conducted in Australia in 2016 summarizes both the market and non-market costs and benefits of education and training for all three levels at which they occur: the country’s economy, the businesses and the participating individuals (Griffin, 2016).

As these non-financial or latent benefits and costs are difficult to quantify, many studies exclude them from cost–benefit analysis. Even so, in all cost–benefit analyses it is important to view the benefits and costs of apprenticeships over a broader time period, not just for the duration of the apprenticeship itself, because the positive impacts of training materialize not in the short term but predominantly in the long run.

Desk studies in the United Kingdom found apprenticeships to be good investments, although returns to businesses, ranging from five per cent to 25 per cent across different sectors, were less than returns enjoyed by individual apprentices (Dockery et al., 1998). According to the survey, which did not involve the same detailed analysis of costs and benefits as the studies in Germany and Switzerland, apprentices gave a net benefit to their employer of £1,845 in 2012/13. While average net benefits varied between regions, only Scotland reported an average net loss among firms there. Another study from England examined the concept of a “payback period” – the time taken after the end of the apprenticeship for employers to recoup their investment – but only in terms of increased productivity. The study found that payback periods varied significantly according to both the sector and the level and duration of the programme (BIS, 2012). The quickest return on investment was six months after the end of the apprenticeship (for Level 2 mechanics), and the slowest returns were three years eight months (for Level 2 in financial services) and three years seven months (for Level 3 engineers).

Table 4. Payback periods by sector

Sector	Apprenticeship level	Payback period
Financial services	2	3 years, 8 months
Engineering	3	3 years, 7 months
Social care	2	3 years, 3 months
Financial services	3	2 years, 6 months
Construction	2 and 3	2 years, 3 months
Retail	2	2 years, 3 months
Hospitality	2	10 months
Business administration	2	9 months
Transport	2 (mechanic)	6 months

Source: Adapted from BIS, 2012, table 2, p. 16.

Public subsidies for apprenticeships also play a role in increasing provision, although the empirical evidence on the effectiveness of such subsidies is still limited (Mühlemann et al., 2007). In order to avoid the possible negative effects in terms of deadweight loss and substitution effects, governments are advised to target apprenticeship subsidies on specific industries and firms (Brunello, 2009; Wolter and Ryan, 2011). Furthermore, direct subsidies

workers with higher and lower abilities, but it is not possible to distinguish between them. As the expected ability of workers from the external labour market is lower, the wage rate would be adjusted accordingly. And as long as the best former apprentices staying with their training companies accept wages that are lower than their productivity, a firm is in a position to generate post-training benefits.

appear to be effective in encouraging firms to start training, but not to increase the demand for apprentices in firms that already train (Mühlemann et al., 2007).

In conclusion, the range of variables affecting potential costs and benefits to employers from apprenticeships makes the task of calculating returns or benefits a complex one. Various studies demonstrate benefits to employers; but, as noted above, the results vary according to specific circumstances and programme variables. Indeed, as noted by Wolter and Ryan (2011), despite the advances of the last two decades, there is as yet no “general theory” to explain the full range of financial attributes seen in practice within, let alone between, countries.

3.4 Apprenticeships – social returns

While the returns on investments in WBL to governments have not been explored across all form of WBL, in the case of apprenticeships some effort has been made to consider the wider benefits of these schemes. Given that apprenticeship schemes generally result in lower unemployment and higher earnings for workers, and most apprenticeship programmes are privately funded, the argument is made that governments save in expenditures on social security and active labour market policies (e.g. unemployment benefits) and gain in increased tax revenue (e.g. payroll tax, value-added tax). The public also benefits from better-quality work, increases in tax revenue and lower social insurance taxes at little to no social cost (Lodovici et al., 2013).

While the savings effect depends on the cost of labour market policies and welfare schemes, some studies confirm a significant economic return on public investment in apprenticeships. Studies in the United Kingdom (McIntosh, 2007) and in the United States (Reed et al., 2012) show that in these two countries the social benefits of apprenticeships exceed costs, although these schemes initially require investment by employers, individual apprentices and society (via public budgets). As noted by Koch (2013), the essence of a “social rate of return”, a social return on investment, is one that takes into account all costs and benefits generated by an apprenticeship, plus all “ripple effects”, wherever and by whomever they are realized. On the cost side, in addition to the costs incurred by the apprentices and their sponsoring firms, there may be other costs, such as those of direct government subsidies to apprenticeship programmes and regulatory costs. On the benefit side, apprenticeships could generate increased tax payments, reduce financial demands on social services and lead to lower crime rates. Needless to say, as with returns for employers and apprentices, the question is one not only of what should be counted as costs and benefits, but also of how to meet the challenge of measuring them accurately.

Reed et al. (2012) found that returns to government ranged from approximately 10 per cent to about 33 per cent. This study estimated the total state and federal costs of administering the registered apprenticeship programme for five states (Florida, Georgia, Missouri, Pennsylvania and Texas) at an average of US\$131 per apprentice. Adding the cost related to the VET institutions (community colleges), which is estimated at US\$587 per apprentice, this yields a total of US\$718 per apprentice. It is further estimated that over the course of their career the apprentice will generate an average of US\$19,875 in tax benefits. This works out at a return of US\$27 for every dollar invested; and if potential benefits such as unemployment insurance, food stamps, welfare and administration costs are included, the total benefit rises to more than US\$35 per US\$1 spent.

Although more research is required across the different types of apprenticeships in different country contexts, there is some persuasive evidence that on balance the benefits of funding apprenticeships far outweigh the costs, for enterprises, governments and apprentices alike.

3.5 Internships and traineeships – impact on learners

As noted by the ILO (2017a), no common legal definition of a traineeship or internship exists. In common-law countries, the term “internship” is typically used to describe work-based schemes outside formal education. In its policy documents, the EU defines “traineeship” as a period of work practice spent in the business, public body or non-profit institution by students or by young people having recently completed their education, in order to gain some valuable hands-on work experience ahead of taking up regular employment (EC, 2012, p. 1); this, in some jurisdictions, could also be called internship. In view of this terminological variation, internships and traineeships as described in the literature will cover a range of different programme types, and any conclusions about the labour market impact of these programmes need to be considered in this light.

Researchers at the Georgetown University Center on Education and the Workforce in the United States found that 63 per cent of college graduates who completed a paid internship received a job offer, compared to 35 per cent who never entered on an internship (Carnevale et al., 2015). Another survey found that an employer was far more likely to offer a job to a student prior to graduation if he or she had had an internship or co-op, especially a paid position. The gap in offer rates between students with internship/co-op experience and those without such experience grew from 12.6 per cent in 2011 to 20 per cent in 2015 (56.5 per cent versus 36.5 per cent) (NACE, 2016). In addition, graduates with paid internships received a starting salary 28 per cent higher than their peers without internship experience.

These findings echo the results of a recent analysis by O’Higgins and Pinedo (2018), which used Eurobarometer survey data along with data collected by the Fair Internship Initiative to examine the post-internship labour market experiences of young people. They find that those participating in paid internships have significantly better post-internship labour market prospects than those participating in unpaid ones.

While it is apparent that different outcomes result from paid and unpaid internships, the availability of paid internships varies. According to the College Employment Research Institute’s 2015–16 Recruiting Trends Report, 71 per cent of employers in the United States provide paid internships. The remaining employers offer either a combination of paid and unpaid internships (14 per cent) or exclusively unpaid internships (15 per cent) (Day, 2016).

Unpaid internships are most likely to be found in the arts and entertainment (55 per cent), educational services (49 per cent), government (27 per cent), health-care and social services (48 per cent), information services (17 per cent) and non-profit-making (53 per cent) sectors. In addition, small companies are 17 per cent more likely to offer unpaid internships than large companies (Day, 2016).

According to the results of the National Association of Colleges and Employers (NACE) Class of 2015 Student Survey, students who took paid internships or co-ops were more likely to receive offers of full-time employment and higher salary offers on completion than were students who took unpaid internships or co-ops (NACE, 2016). The survey, which was administered to 39,950 students at associate, bachelor, master and doctoral degree levels through NACE’s college members in 2015, found that paid internships/co-ops with private, for-profit companies yielded the highest job offer rate (72.2 per cent). In contrast, just 43.9 per cent of students who had unpaid internships/co-ops with private, for-profit companies received offers (see table 5).

Table 5 also shows the different offer rates between paid and unpaid positions evident across employer types, specifically the non-profit-making (51.7 per cent vs 41.5 per cent), state/local government (50.5 per cent vs 33.8 per cent), and federal government (61.9 per cent vs 50 per cent) sectors.

There was a similar pattern in respect of starting salary offers. Having had a paid internship/co-op with a private, for-profit company yielded the highest median offer at US\$53,521, while the median offer for students who had taken unpaid internships/co-ops with private, for-profit companies was US\$34,375 (NACE, 2016). Higher starting salaries improve graduates' ability to repay debt and have long-term implications for career earnings: as merit raises are typically determined as a percentage of salary, the higher the starting salary, the higher the raise (Day, 2016).

Another significant survey of interns was conducted by InternMatch, which surveyed over 9,000 students across the United States and from all walks of life for its 2014 Intern Report. Key results were that students with paid internships were three times more likely to have job offers than students with unpaid internships; students with three or more internships were twice as likely to have a job offer than students with just one internship; and 48.3 per cent of internships were paid in 2014 (InternMatch, 2014).

Table 5. Job offer rates and starting salary offers, by type of internship/co-op experience

Pay status	Employer type	Applied (no.)	Received offer (no.)	Offer rate (%)	Median starting salary offer (US\$/year)
Paid	Private, for-profit company	1 015	733	72.2	53 521
	Non-profit organization	178	92	51.7	41 876
	State or local government agency	101	51	50.5	42 693
	Federal government agency	42	26	61.9	48 750
Unpaid	Private, for-profit company	253	111	43.9	34 375
	Non-profit organization	299	124	41.5	31 443
	State or local government agency	139	47	33.8	32 969
	Federal government agency	30	15	50.0	42 501
No internship or co-op		941	343	36.5	38 572

Source: NACE, 2016.

On the basis of this evidence, it would appear that participation in internships or traineeships produces positive labour market impacts for learners in terms of both employment and wages.

3.6 internships and traineeships – impact on enterprises

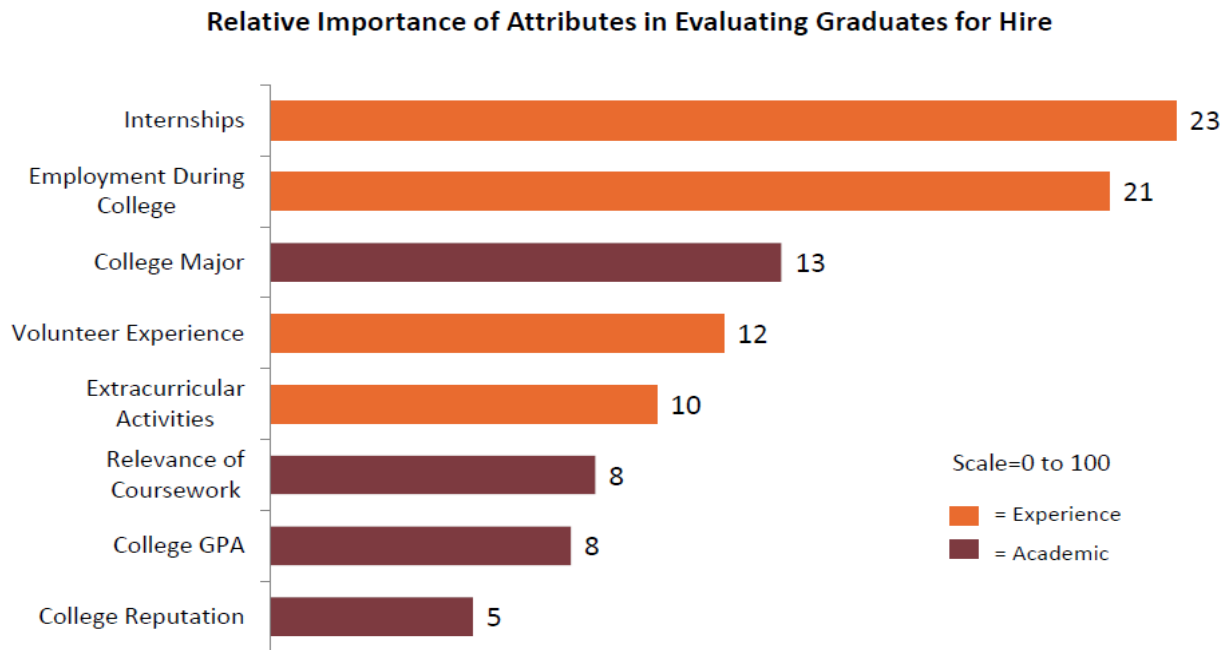
A survey of employers who hired recent college graduates in the United States, undertaken by the *Chronicle of Higher Education* in 2012, showed that employers gave considerable weight to internships in their recruitment decisions. It found that:

- employers place more weight on experience, particularly internships and employment during the educational career, than on academic credentials when evaluating a recent graduate for employment;
- this emphasis on student work or internship experience, as opposed to academic credentials, applies at least to some extent across all industries and hiring levels;
- the emphasis is more pronounced in the science/technology, services/retail and media/communications sectors than in other industries;
- an internship is the single most important credential for recent college graduates to have on their resumés in their job search across all industry

segments, with media/communications placing the highest value on internships among all sectors considered (Chronicle of Higher Education, 2012).

The survey also found that, when experience is broken down, more weight was placed on internships than on employment during college or volunteer work. It further noted that, as shown in figure 6 below, internships and employment during college were the assets most valued by employers.

Figure 6. Weighting of factors influencing hiring decisions



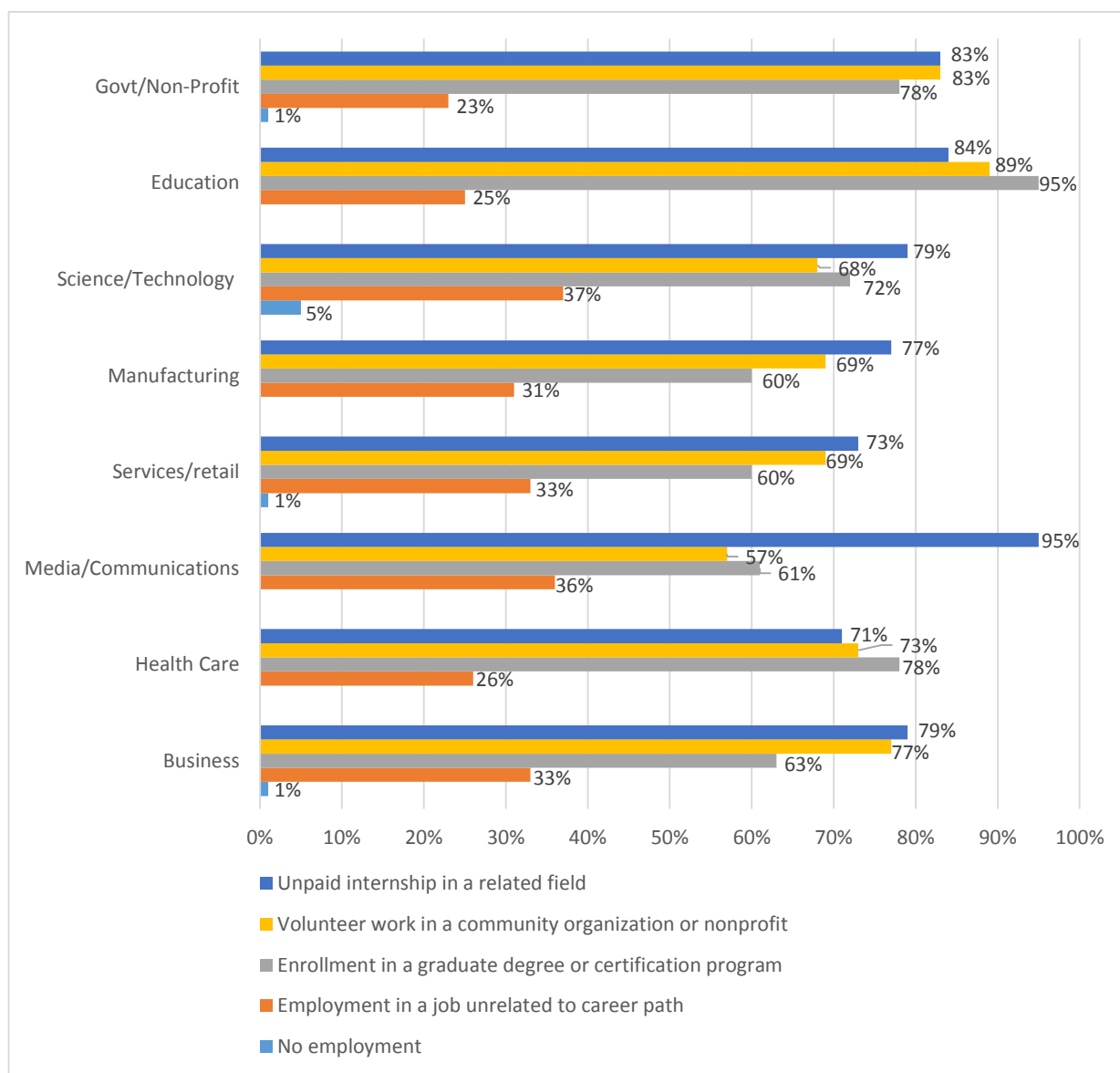
Note: GPA = grade point average.

Source: Chronicle of Higher Education, 2012, figure 7, p. 24.

As some graduates are unable to find work experience in their chosen fields, employers generally place unpaid internships, followed by volunteer work, as the best alternatives when they evaluate graduates for hire (see figure 7). Employment in an unrelated field has much less positive impact but is still strongly favoured over no employment at all. When employers' views are analysed by industry, those in media/communications emerge as valuing unpaid internships more than any other type of work experience. Interestingly, unpaid internships ranked high with employers in evaluating candidates across industries.

It is clear, then, from these analyses that participation in internships is a major factor in employers' recruitment decisions.

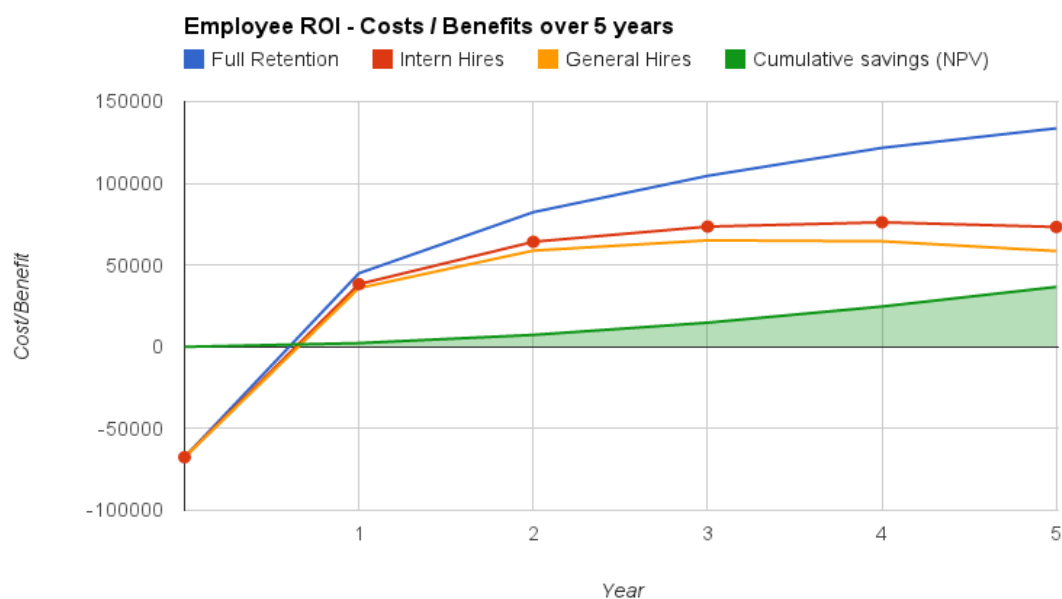
Figure 7. Factors influencing hiring decisions, by sector: % of respondents indicating a “positive impact” on evaluation of candidate



Source: *Chronicle of Higher Education*, 2012, figure 53, p. 86.

It is generally understood that improved retention is one of the main benefits of hiring interns relative to other hires. In research on the return on investment to employers from internships in the United Kingdom, EreMedia found that, after a year, nearly 86 per cent of those who had taken part in an internship at the hiring organization were still employed, compared with about 81 per cent of those who had not done an internship (Saidov, 2014). Figure 8 shows that over five years this difference is amplified to 55 per cent vs 44 per cent respectively — something that may be attributed to the improved cultural fit between employee and employer that an internship can help both identify and foster. These differences have a substantial implication for a cost–benefit calculation in relation to an internship programme.

Figure 8. Cost–benefit profile of hiring options: Return on investment over five years



Note: NPV = net present value.
Source: Saidov, 2014.

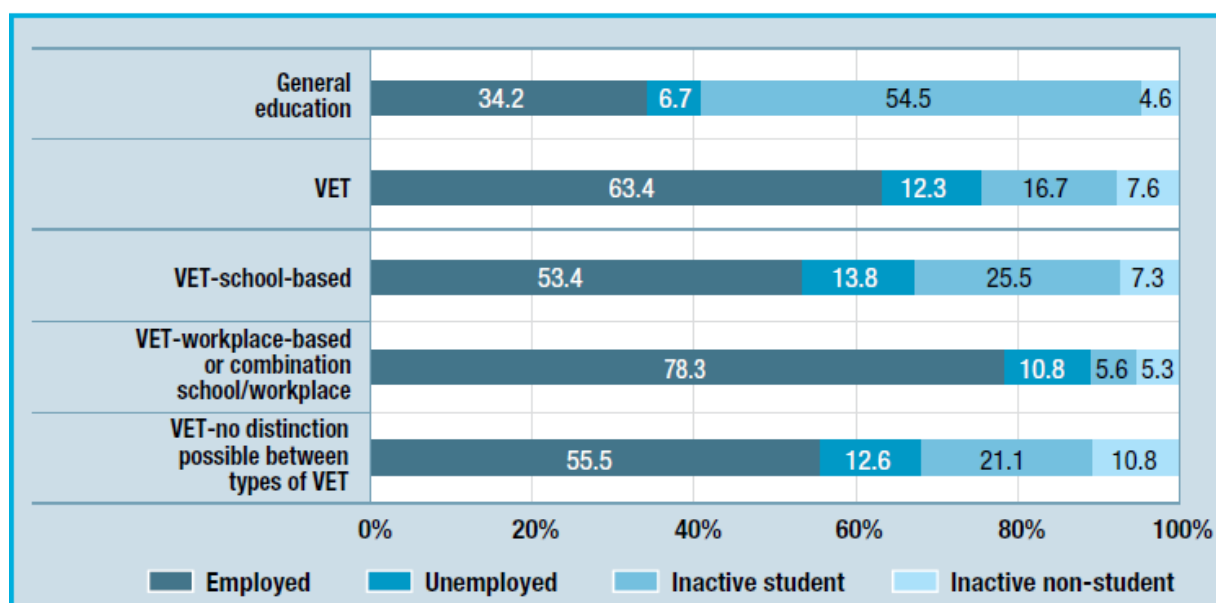
3.7 Other work–study combinations

As noted above, a wide range of programmes can be classified as some form of WBL. As well as the major types of programmes considered here under the labels of apprenticeships, internships and traineeships, other programmes exist that involve a combination of learning in workplaces and institutions. However, with these more diverse types of programmes, the issues of definition and data availability are more acute. Combined school- and work-based programmes can be quite different in terms of their practical arrangements – for example, work and study periods may alternate continually over the course of the programmes, and there are varying proportions of study and work in WBL programmes across different countries.

In Germany, for example, the ratio is 30 per cent school-based time to 70 per cent work-based training time, while in Belgium there is a minimum threshold of 50 per cent of training in the company (CEDEFOP, 2014). In other systems, school-based study and work-based study may be consecutive instead of parallel. The Norwegian 2+2 model, for instance, divides a four-year vocational training course into a two-year school-based learning period and a two-year work-based learning period (OECD, 2016a). All these programmes can be considered as examples of WBL.

Despite this diversity, CEDEFOP suggests, using data from the EU, that some trends can be identified. The proportion of employed graduates from programmes with a WBL component in secondary and post-secondary non-tertiary education (78.3 per cent of the total population) is noticeably higher than among those who finish programmes without a WBL component (see figure 9). Within the former group, the proportion of economically inactive people is just 10.9 per cent of the total (of which those not in education account for around five per cent). By contrast, when TVET is institution based, the employment rate for graduates is 53.4 per cent and the share of inactive people increases to almost one-third, with the percentage of those not in education standing at seven per cent. Similar trends are visible in figure 10, based on data for older age cohorts.

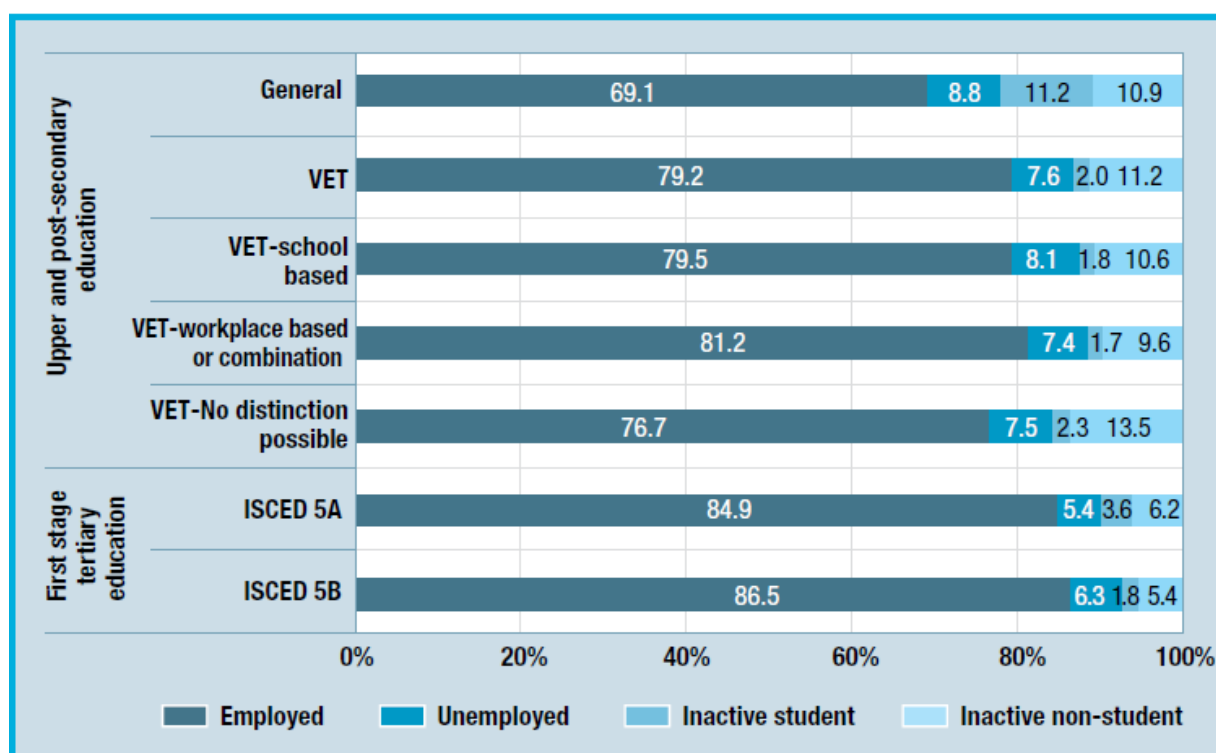
Figure 9. Labour status of medium-level graduates by orientation, 18–24 year-olds, EU-27+, 2009



Note: EU-27+ refers to the EU including Britain in the process of Brexit.

Source: CEDEFOP, 2012, figure 11, p. 35.

Figure 10. Employment status by educational attainment and orientation, 25–34 year-olds, EU-27+, 2009



Note: EU-27+ refers to the EU including Britain in the process of Brexit.

Source: CEDEFOP, 2012, figure 12, p. 37.

Figure 11, presenting OECD data, shows that in the case of Austria, France, Germany and Switzerland, among adults with upper secondary or post-secondary but non-tertiary education, those aged 25–34 with work–study qualifications have better employment rates than adults of similar age with general education. They also have lower unemployment rates and lower economic inactivity rates (OECD, 2016c).

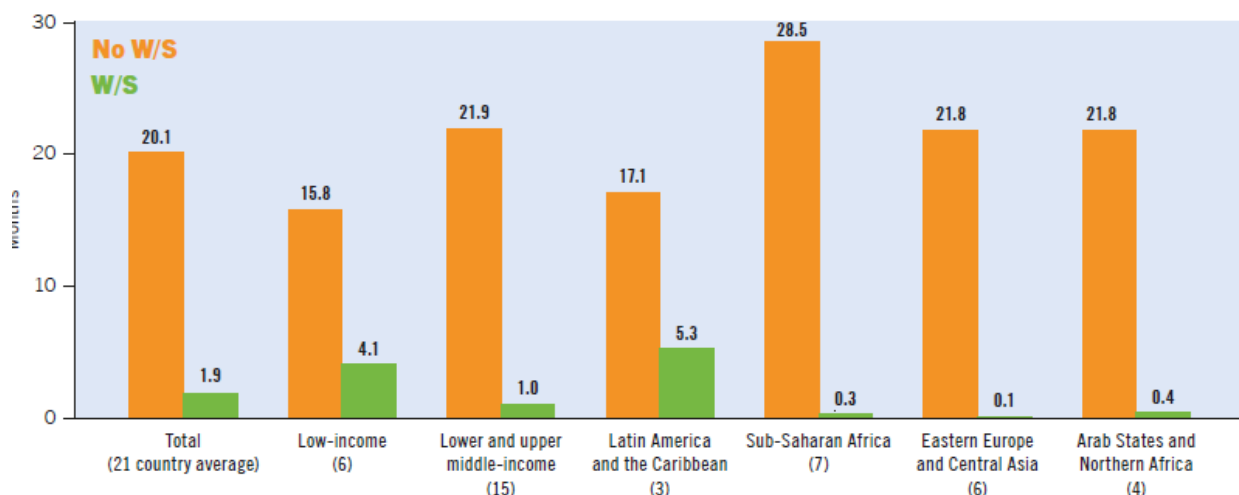
Figure 11. Employment rates of work–study and general education programmes



Source: OECD, 2016c, figure b, p. 7.

As one of the main justifications of WBL programmes is the claim that they improve the transition for young people from school to work, this issue was explored through the ILO School-to-Work Transition Surveys (SWTS) carried out between 2012 and 2016. In all, 53 surveys were completed across 30 developing countries, with results representing 335 million young people between the ages of 15 and 29. Two studies based on the SWTS found that, on average across countries, the duration of the transition to employment for students who had combined work with study was 1.9 months compared with 20.1 months for those who had undertaken institution-only training. These results are reflected in figure 12.

Figure 12. Length of school-to-work transition by work–study combination



Notes: No W/S = non-work–study combiners; W/S = work–study combiners, excluding apprenticeships. On the horizontal axis, the number in parentheses is the number of countries covered.

Source: ILO, 2017a, figure 3.4, p. 35.

There is also much impact evaluation evidence demonstrating that active labour market programmes for youth which combine work experience in private firms with off-the-job training have the highest positive impact on post-programme employment and earnings (see e.g. Kluve et al., 2016, Bördös et al., 2017, as well as older evidence in O’Higgins, 2001).

Thus, while data are limited, the available evidence suggests that programmes that involve a WBL component deliver a range of benefits to employers, learners and governments beyond those which accrue from programmes that do not.

4. Discussion

As evidenced by the number of studies considering the topic, WBL has high policy relevance worldwide. Numerous countries are working to develop or improve their education systems to broaden the range of WBL opportunities at upper secondary or post-secondary level and, in certain cases, within tertiary education.

The pattern of findings emerging from the literature presented in this paper, from a variety of sources, suggests that programmes involving WBL facilitate transitions to decent work and lead to stronger and better labour market outcomes for learners, employers and governments, in terms of better employment outcomes and wages for learners and positive rates of return on investment to employers and governments.

Despite this general conclusion, however, it needs to be recognized that the definitional issues and lack of an agreed typology of programmes not only constrain meaningful policy debates on the topic but hamper the collection of internationally comparable statistics on the nature, prevalence and outcomes of WBL programmes. Currently, internationally comparable indicators do not report on the outcomes of WBL programmes or even measure the prevalence of such programmes (OECD, 2016b). Furthermore, detailed firm-level analysis of the costs and benefits of WBL is limited to a few countries.

This paper has highlighted the definitional issues surrounding the range of programme types that involve WBL and has considered several typologies used to represent the defining characteristics of these programmes. These various typologies highlight different factors, including:

- how the programme is structured and whether certification (formal, informal, or non-formal, recognized) is obtained;
- whether earnings of some form (wages, stipends, allowances) are received;
- whether a contract or some form of agreement exists between the parties involved; and
- consideration of the respective shares of learning that occur in the workplace and/or in an educational or training institution.

While a typology of WBL programmes may be considered a purely academic exercise, consideration of these and other factors will be necessary if an internationally agreed statistical definition is to be developed for the purpose of improving data collection on these types of programmes. While the issue has yet to be raised at the International Conference of Labour Statisticians (ICLS), it is likely to be further examined through the ongoing work of the OECD Network on Indicators of Education Systems (INES Network: see e.g. OECD, 2016c).

The definition and data issues noted above affect the comparability of programmes. For example, while Bördös et al. (2017) suggest that wage subsidy programmes including a WBL component deliver the best outcomes when more than six months in duration, there is no clear picture of the minimum duration of WBL, across all programme types, necessary to deliver enhanced labour market outcomes compared with programmes without WBL. Furthermore, despite the positive outcomes of paid internships and apprenticeships, there is no clear picture of whether employment status is a significant variable influencing programme outcomes. However, the labour market impact of participation in WBL does seem higher for learners who are paid for the WBL component of their programmes, as is the case for some interns and most apprentices, than for those learners who are not paid.

Financial and non-financial returns for employers are usually positive in the case of both internships and apprenticeships, although they vary greatly – by programme type, by the duration and skill level of the programme, and by the extent to which learners contribute to the productive activities of the enterprise. With apprenticeships in particular, benefits continue to accrue to employers after the apprenticeship is concluded. Despite the generally positive picture presented in the literature, further quantitative and qualitative studies on the return to employers in specific country contexts are required to support policy efforts to expand the availability of WBL opportunities for learners in the TVET and higher education sectors. While the available data on the social returns to government from WBL are limited, the existing studies on apprenticeships do suggest strong returns in terms of lower social security costs and higher tax earnings.

In view of this emerging picture, TVET appears to be effective at getting the youngest age groups in the labour market into work by bringing workplace-based training into the education and training domain, with apprenticeships and paid internships appearing particularly valuable. Developing training and education in the workplace rather than in institutions has several advantages. First, there are specific aspects of workplace training that are difficult to replicate in learning processes based on traditional teaching methods, in particular the use of up-to-date equipment, although the application of sophisticated simulation technology is closing this gap. Second, workplace training improves the two-way flow of knowledge and information between employers and employees, thereby improving the employee's chances of being offered a job and providing real enculturation of learners into the world of work. Third, the direct contribution of many trainees to production is a clear indication of the market value of TVET programmes.

Taking all these observations together, the growth of WBL programmes is likely to continue, especially given concurrent policy moves to improve links between workplaces and education/training institutions, and concerns around youth and graduate employability. However, if WBL opportunities are to be substantially expanded, greater involvement of employers will be required. To this end, as the demand for WBL opportunities increases, employers must be presented with better information and data on the potential costs and benefits associated with these types of programmes.

5. Conclusion

Given the generally positive evidence of the benefits of WBL, governments and social partners should continue efforts to expand provision of this kind of learning. However, expanding the provision of formal, structured WBL will require enhanced partnerships between the State and the private sector. While effective WBL relies on partnerships at the local level between individual workplaces and individual education and training institutions, at a system or policy level the private sector should be given opportunities to lead policy and strategy to expand the provision of WBL opportunities on terms that are attractive to employers.

The ADB has argued that to improve the outcomes of WBL, countries should review their TVET systems through a WBL lens, partner with employer associations to pilot WBL in selected sectors, require a WBL component to be included within infrastructure projects, and support public and private training institutions so that more TVET programmes combine on- and off-the-job training (ADB, 2017). These are particularly relevant recommendations for developing economies, where informal WBL remains particularly prevalent, and, with the addition of institutional provision, is increasingly being formalized.

A necessary adjunct to these policy-led approaches is the collection of more, and more robust, data on the prevalence and labour market outcomes of WBL, chiefly for employers, but also for the wider target audience for social marketing efforts, governments and individuals alike. If data on the benefits of WBL are more readily available and are used to argue for increased participation by employers and education and training institutions, then the growing demand from learners themselves will be more readily accommodated.

Efforts to build the knowledge base and share more robust data on WBL will continue to be compromised if a more coherent approach to the definition and classification of WBL schemes is not developed. In the absence of this more coherent approach, evidence-based policy-making will continue to be hampered by the fog that envelops efforts to compare and contrast WBL schemes, despite the apparent positive benefits these schemes offer to learners, employers and governments alike.

References

- Acemoglu, D.; Pischke, J.S. 1998. “Why do firms train? Theory and evidence”, in *Quarterly Journal of Economics*, Vol. 113, No. 1, pp. 79–119.
- Asian Development Bank (ADB). 2017. *Work-based learning: Developing the quality, relevance and quantity of skills training*, ADB working paper RETA 8503 (Manila, Asian Development Bank Publishing).
- Atkinson, G. 2016. *Work-based learning and work-integrated learning: Fostering engagement with employers* (Adelaide, National Centre for Vocational Education Research).
- Ayres, C. 2014. “Apprenticeships in the United States: Can they improve youth employment outcomes?”, in Randolph, G. (ed.): *Overcoming the youth employment crisis: Strategies from around the globe* (New Delhi and Washington DC, JustJobs Network), pp. 37–51. Available at: <http://justjobsnetwork.org/wp-content/pubs/reports/Overcoming%20the%20Youth%20Employment%20Crisis.pdf> [31 May 2018].
- Bellmann, L.; Kohaut, S.; Lahner, M. 2002. “Das IAB Betriebspanel – Ansatz und Analysepotenziale”, in G. Kleinhenz (ed.): *IAB-Kompendium Arbeitsmarkt- und Berufsforschung* (Nürnberg, Institut für Arbeitsmarkt- und Berufsforschung), pp. 13–20.
- Bertschy, K.; Cattaneo, M.A.; Wolter, S.C. 2009. “PISA and the transition into the labour market”, in *Labour: Review of Labour Economics and Industrial Relations*, Vol. 23, No. 1, pp. 111–137.
- Bonnal, L.; Mendes, S.; Sofer, C. 2002. “School-to-work transition: Apprenticeship versus vocational school in France”, in *International Journal of Manpower*, Vol. 23, No. 5, Aug., pp. 426–442.
- Bördös, K.; Csillag, M.; O’Higgins, N.; Scharle, A. 2017. “Active labour market programmes: The role of wage subsidies,” in N. O’Higgins (ed.): *Rising to the youth employment challenge: New evidence on key policy issues* (Geneva, ILO).
- Bougheas, S.; Georgellis, Y. 2004. “Early career mobility and earnings profiles of German apprentices: Theory and empirical evidence”, in *Labour: Review of Labour Economics and Industrial Relations*, Vol. 18, No. 2, pp. 233–263.
- Brunello, G. 2009. *The effect of economic downturns on apprenticeships and initial workplace training: A review of the evidence* (Paris, OECD). Available at: <http://www.oecd.org/education/skills-beyond-school/43141035.pdf> [1 June 2018].
- Bruno, R.; Manzo, F. 2016. *The impact of apprenticeship programs in Illinois: An analysis of economic and social effects* (Chicago, University of Illinois).
- Büchel, F. 2002. “Successful apprenticeship- to-work transitions: On the long-term change in significance of the German school-leaving certificate’, *International Journal of Manpower*, Vol. 23, no. 5, pp. 394–410.
- Business/Higher Education Roundtable (BHER); Academica. 2015. *Taking the pulse of work-integrated learning in Canada*. Available at: <http://bher.ca/wp-content/uploads/2016/10/BHER-Academica-report-full.pdf> [15 May 2018].

-
- Business, Innovation and Skills, Department of (BIS). 2012. *Employer investment in apprenticeships and work-based learning: The fifth net benefits of training to employers study* (London, Department of Business, Innovation and Skills). Available at: <https://www.gov.uk/government/publications/employer-investment-in-apprenticeships-and-workplace-learning-the-fifth-net-benefits-of-training-to-employers-study> [14 May 2018].
- Cappellari, L.; Dell’Ariaga, C.; Leonardi, M. 2012. “Temporary employment, job flows and productivity: A tale of two reforms”, in *Economic Journal*, Vol. 122, No. 562, pp. 188–215.
- CareersNZ. 2016. *Work-place training and apprenticeships* (Auckland, New Zealand Government). Available at: <https://www.careers.govt.nz/courses/workplace-training-and-apprenticeships/> [15 May 2018].
- Carnevale, A.P.; Smith, N.; Melton, M.; Price, E.W. 2015. *Learning while earning: The new normal* (Washington, DC, Centre on Education and the Workforce, Georgetown University). Available at: <https://cew.georgetown.edu/cew-reports/workinglearners/>.
- Centre for Economics and Business Research (CEBR). 2013. *Productivity matters: The impact of quality apprenticeships on the UK economy* (London).
- Chen, J.; Luo, Z.; Mai, H.; Yan, Q. 2013. “Case study on cost, benefit, and quality of apprenticeship project in China”, in S. Akoojee, Ph. Gonon, U. Hauschildt and C. Hoffmann (eds): *Apprenticeship in a globalised world: Premises, promises and pitfalls* (Münster, Lit), pp. 251–254.
- Chronicle of Higher Education*. 2012. *The role of higher education in career development: Employer perceptions*. Available at: www.chronicle.com/items/biz/pdf/Employers%20Survey.pdf [14 May 2018].
- Clark, D.; Fahr, R. 2002. *The promise of workplace training for non-college bound youth* (London, Centre for Economic Performance, London School of Economics).
- Council on Higher Education (CHE). 2011. *Work-integrated learning: Good practice guide*, HE Monitor No. 2 (Pretoria). Available at: http://www.che.ac.za/sites/default/files/publications/Higher_Education_Monitor_12.pdf [15 May 2018].
- Cramer, G.; Müller, K. 1994. *Nutzen der betrieblichen Berufsausbildung* (Köln: Institut der Deutschen Wirtschaft).
- Day, L. 2016. *Internships: The ultimate return on investment for today's college student*, Forbes Coaches Council. Available at: <https://www.forbes.com/sites/forbescoachescouncil/2016/11/09/internships-the-ultimate-return-on-investment-for-todays-college-student/#42e7698643a6> [14 May 2018].
- Dockery, A.M.; Norris, K.; Stromback, T. 1998. “The social return to apprenticeship training”, in *Australian Economic Review*, Vol. 31, No. 1, pp. 37–46.
- European Centre for the Development of Vocational Training (CEDEFOP). 2012. *From education to working life: The labour market outcomes of vocational education and training* (Thessaloniki). Available at: <http://www.cedefop.europa.eu/en/publications-and-resources/publications/3063> [14 May 2018].

----- 2014. *Developing apprenticeships*, briefing note (Thessaloniki).

European Commission (EC). 2012. *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions towards a quality framework on traineeships* (Brussels). Available at:

<https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:52012DC0728> [1 June 2018].

— 2015. *High-performance apprenticeships and work-based learning: 20 guiding principles*, Dec. (Brussels). European Training Foundation (ETF). 2013. *Work-based learning: Benefits and obstacles. A literature review for policy makers and social partners in ETF partner countries* (Turin). Available at: [http://www.etf.europa.eu/webatt.nsf/0/576199725ED683BBC1257BE8005DCF99/\\$file/Work-based%20learning_Literature%20review.pdf](http://www.etf.europa.eu/webatt.nsf/0/576199725ED683BBC1257BE8005DCF99/$file/Work-based%20learning_Literature%20review.pdf) . [15 May 2018].

[Euwals](#), R.; [Winkelmann](#), R. 2004. “Training intensity and first labor market outcomes of apprenticeship graduates”, in *International Journal of Manpower*, Vol. 25, No. 5, pp. 447–462.

Fersterer, J.; Pischke, J.S.; Winter-Ebmer, R. 2008. “Returns to apprenticeship training in Austria: Evidence from failed firms”, in *Scandinavian Journal of Economics*, Vol. 110, No. 4, Dec., pp. 733–753.

Glover, R.; Bilginsoy, C. 2005. “Registered apprenticeship training in the US construction industry”, in *Education and Training*, Vol. 47, Nos 4–5, pp. 337–347.

Griffin, T. 2016. *Cost and benefits of education and training for the economy, the business and the individuals* (Adelaide, National Centre for Vocational Education and Training Research).

Hauschildt, U. 2016. *CBQ project report*, unpublished report (Bremen, University of Bremen).

— 2017. *Methodologies to measure costs and benefits of in-company apprenticeship training*, unpublished discussion paper prepared for ILO, Geneva.

Inter-Agency Group on TVET (IAG-TVET). 2017. *Investing in work based learning* (Geneva, ILO). Available at: http://www.ilo.org/skills/pubs/WCMS_565923/lang--en/index.htm [14 May 2018].

International Labour Office (ILO). 2008. “Conclusions on skills for improved productivity, employment growth and development”, in *Resolutions adopted by the International Labour Conference at its 97th Session*, International Labour Conference, 97th Session, Geneva, 2008 (Geneva).

— 2012a. *The youth employment crisis: A call for action* (Geneva).

— 2012b. *Upgrading informal apprenticeship: A resource guide for Africa* (Geneva).

— 2017a. *ILO toolkit for quality apprenticeships*, Vol. 1: *Guide for policy-makers* (Geneva).

— 2017b. *Defining work-based learning*, unpublished discussion paper, Skills and Employability Branch (Geneva).

-
- , Organisation for Economic Co-operation and Development (OECD). 2017. *Better use of skills in the workplace: Why it matters for productivity and local jobs* (Geneva and Paris)
- InternMatch. 2014. *Intern Report*. Available at: <https://visual.ly/community/infographic/education/internmatch-2014-intern-report> [18 May 2018].
- Jansen, A.; Strupler Leiser, M.; Wenzelmann, F.; Wolter, S. 2015. “Labour market deregulation and apprenticeship training: A comparison of German and Swiss employers”, in *European Journal of Industrial Relations*, Vol. 21, No. 4, pp. 353–368.
- Kis, V. 2016. *Work based learning for youth at risk: Getting employers on board* (Paris, OECD). Available at: <http://www.oecd.org/edu/skills-beyond-school/work-based-learning-in-vocational-education-and-training-vet-papers-and-reports.htm> [14 May 2018].
- Kluve, J.; Puerto, S.; Robalino, D.; Romero, J.M.; Rother, F.; Stöterau, J.; Weidenkaff, F.; Witte, M. 2016. *Interventions to improve the labour market outcomes of youth: A systematic review of training, entrepreneurship promotion, employment services, mentoring, and subsidized employment interventions* (Oslo, Campbell Collaboration).
- Koch, J. 2013. *Rates of return on investments in apprenticeships: Summary of the empirical evidence*. Available at: https://www.google.ch/search?q=Rates+of+Return+on+Investments+in+Apprenticeships:+Summary+of+the+Empirical+Evidence+James+V.+Koch&ie=utf-8&oe=utf-8&gws_rd=cr&ei=7AAwWY6YJ4GVUdO2pPAI [14 May 2018].
- Kuczera, M. 2017. *Striking the right balance: Costs and benefits of apprenticeship*, OECD Education Working Papers No. 153 (Paris, OECD).
- Lerman, R. 2014. *Do firms benefit from apprenticeship investments?* (Bonn, IZA World of Labor). Available at: <https://wol.iza.org/articles/do-firms-benefit-from-apprenticeship-investments> [14 May 2018].
- Lodovici, M.; Comi, S.; Origo, F.; Patrizo, M.; Torchio, N. 2013. *The effectiveness and cost benefits of apprenticeships: Results of the quantitative analysis* (Brussels, European Commission). Available at: <https://www.employment-studies.co.uk/resource/effectiveness-and-costs-benefits-apprenticeships-results-quantitative-analysis> [14 May 2018].
- McIntosh, S. 2007. *A cost–benefit analysis of apprenticeships and other vocational qualifications*, University of Sheffield, Research Report No. 834 (London, Department for Education and Skills).
- Ministry of Education, Culture and Science. 2013. *Key figures 2009–2013* (The Hague, Government of the Netherlands).
- Mohrenweiser, J.; Zwick, T. 2009. “Why do firms train apprentices? The net cost puzzle reconsidered”, in *Labour Economics*, Vol. 16, No. 6, pp. 631–637.
- Mühlemann, S. 2016. *The cost and benefits of work-based learning*, OECD Education Working Papers No. 143 (Paris, OECD).
- ; Fuhrer, M.; Wüest, A.; Wolter, S.C. 2007. *Lehrlingsausbildung – ökonomisch betrachtet: Ergebnisse der zweiten Kosten-Nutzen-Studie* (Chur and Zürich, Rüeegger).

-
- ; Wolter, S. 2013. *Return on investment of apprenticeship systems for enterprises: Evidence from cost–benefit analyses*, analytical report for the European Commission, prepared by the European Expert Network on Economics of Education.
- National Association of Colleges and Employers (NACE). 2016. *Class of 2015 student survey* (Bethlehem, Pa., National Association of Colleges and Employers).
- O’Higgins, N. 2001. *Youth unemployment and employment policy: A global perspective* (Geneva, ILO).
- ; Pinedo, L. 2018. *Interns and outcomes: Just how effective are internships as a bridge to stable employment?* Employment Working Paper No. 241 (Geneva, ILO).
- Olinsky, B.; Ayers, S. 2013. *Training for success: A policy to expand apprenticeships in the United States* (Washington, DC, Centre for American Progress).
- Organisation for Economic Co- Operation and Development (OECD). 2016a. *Education at a Glance 2016: OECD indicators* (Paris).
- . 2016b. *Work, train, win: Work-based learning design and management for productivity gains*, OECD Education Working Paper No. 135 (Paris).
- . 2016c. *Prevalence of work–study programs and results from the pilot survey on outcomes of work–study programmes*, INES Network on Labour Market, Economic and Social Outcomes of Learning Discussion Paper INES-LSO-LLT No. 13 (Paris, OECD).
- . 2017. *Education at a glance 2017: OECD indicators*, (Paris).
- Philips, P. 2015. *Indiana’s common construction wage law: An economic impact analysis* (Salt Lake City, University of Utah). Available at: <http://keystoneresearch.org/sites/default/files/Indiana%20Report%20January%202015.pdf> [1 June 2018].
- Quintini, G.; Manfredi, T. 2009. *Going separate ways? School-to-work transitions in the United States and Europe* (Paris, OECD).
- Reed, D.; Yung-Hsu Liu, A.; Kleinman, R.; Mastri, A.; Reed, D.; Sattar, S.; Ziegler, J. 2012. *An effectiveness assessment and cost-benefit analysis of registered apprenticeship in 10 states* (Washington, DC, Mathematica Policy Research).
- Rothboeck, S. 2014. *Using benefit cost calculations to assess returns from apprenticeship investment in India: Selected SME case studies*, ILO Asia Pacific Working Papers Series (Geneva).
- [Ryan, P. 1998](#). “Is apprenticeship better? A review of the economic evidence”, in *Journal of Vocational Education and Training*, Vol. 50, No. 2, pp. 289–325.
- . 2000. “The institutional requirements of apprenticeship: Evidence from smaller EU countries”, in *International Journal of Training and Development*, Vol. 4, No. 1, pp. 42–65.
- Saidov, S.M. 2014. *Improve the ROI of internships* (New York, EreMedia, 27 Aug.). Available at: <https://www.eremedia.com/ere/improve-the-roi-of-internships/> [14 May 2018].

-
- Sung, J.; Ashton, D. 2014. *Skills in business: The role of business strategy, sectoral skills development and skills policy* (London, Sage).
- Sweet, R. 2011. “Work-based learning: Why? How?”, in *Revisiting global trends in TVET: Reflections on theory and practice* (Bonn, UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training).
- Tyler-Smith, K. 2012. *Workplace-based learning: Introducing a new applied degree paradigm*, Otago Polytechnic, National Centre for Tertiary Teaching Excellence (Otago, AKO Aotearoa). Available at: <https://akoaotearoa.ac.nz/download/ng/file/group-7/workplace-based-learning-introducing-a-new-applied-degree-paradigm.pdf> [15 May 2018].
- United Nations Educational, Scientific and Cultural Organisation (UNESCO). 2015. *Unleashing the potential: Transforming technical vocational education and training* (Paris).
- United States Department of Commerce (USDC). 2016. *The benefits and costs of apprenticeships: A business perspective* (Washington DC, Economics and Statistics Department). Available at: <http://www.esa.doc.gov/sites/default/files/the-benefits-and-costs-of-apprenticeships-a-business-perspective.pdf> [1 June 2018].
- Walden, G.; Herget, H. 2002. “Nutzen der betrieblichen Ausbildung für Betriebe – erste Ergebnisse einer empirischen Befragung”, in *Berufsbildung in Wissenschaft und Praxis*, Vol. 31, No. 6, pp. 32–37.
- Warwick University. 2012. *Review of apprenticeship research: A summary of research published since 2010* (Warwick, Institute for Employment Research, University of Warwick).
- Wolter, S.; Ryan, P. 2011. “Apprenticeships”, in *Handbook of the Economics of Education*, Vol. 3 (London, Elsevier), pp. 521–576.

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