



Monitoring and evaluating work-based learning in vocational education and training



A handbook for policy makers and social partners



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- section on the supply and demand of training places – by Frederik Hugo;
- sections on companies' participation; financial resources, costs and benefits; digital technologies; dropping out from work-based learning – by Stefan Thomas;
- sections on labour market information; outcomes of work-based learning – by Wolfgang Wittig.

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Introduction

This handbook has been prepared to support efforts to modernise vocational education and training (VET) systems and strengthen work-based learning. It is part of a series of handbooks designed to provide policy makers, social partners and VET institutions with practice-oriented information and tools from various country settings. Previous volumes in the series include:

- *Financing work-based learning as part of vocational education reform: A handbook for policy makers and social partners*
- *Work-based learning: How ready are we? A tool for ETF partner countries*
- *Work-based learning: A handbook for policy makers and social partners in ETF partner countries*

While these volumes all relate to the establishment of work-based learning and its prerequisites, this handbook is about managing existing work-based learning schemes by incorporating monitoring

and evaluation methods. Following a brief discussion of the concept of work-based learning, the handbook presents the rationale for monitoring and evaluation as part of good governance. The functioning of work-based learning schemes is represented by a process model comprising four stages: input, process, output and outcome. For each of these four stages, examples of relevant indicators and tools from several countries around the globe are presented. These tools cover the following topics:

- support from companies and learners,
- financial resources, costs and benefits,
- curriculum design,
- quality of training staff,
- organisation of the learning process,
- use of digital technologies,
- assessment of learners,
- learning achievements,
- labour-market outcomes.



1. Work-based learning in vocational education and training

1.1 What is work-based learning?

Work-based learning (WBL) has been on the education policy agenda for years and is commonly regarded as a key element of providing labour market-oriented vocational education and training, thereby promoting lifelong careers and employability of learners, and addressing the skills needs of enterprises. At the same time, there is some uncertainty as to what exactly this term means and how WBL may be distinguished from other forms of learning.

In this handbook, the term work-based learning is understood in line with the definition used by the European Training Foundation (ETF, 2018a, p. 5), as follows: The key point of work-based learning is **knowledge acquisition and competence development in a genuine working environment**. This includes the typical technological, technical, social and economic learning content and skills that are required at work.

Sometimes, WBL is also referred to as ‘*workplace learning*’ (see e.g. MacKenzie and Polvere, 2009; Hager, 2019). We prefer WBL, as it is a wider term that includes learning at a particular workplace as well as the job profile in a wider organisational context.

For policy makers, WBL is of specific interest when it becomes part of formal VET. Then, it will typically be complemented by some form of school-based learning. However, it can also become formalised by being acknowledged as part of a qualification. Examples of work-based learning that fall somewhere between fully incidental, or informal, and more formalised learning are modelling, i.e. the observation and imitation of experienced colleagues, and experiential learning (Maurer, 2018, p. 3).

There are several borderline types of learning that are sometimes also referred to as work-based learning. Examples include learning in classic classroom situations organised by the company; or school-based learning that takes place in simulated work environments, such as school workshops, and including, for instance, the virtual simulation of machines, engines and work processes.

Ultimately, learning can take place anywhere – at work, in school, within families, etc. – unintentionally and without explicitly defined learning objectives. Such informal learning mechanisms are not the focus of this handbook, but it is nevertheless important to acknowledge their existence, since unintentional learning may also occur in structured learning situations, just not to the desired outcome.

The reference to the **working environment** also highlights a feature that distinguishes WBL from other types of education, namely its essentially vocational character. Work-based learning is always oriented towards occupations (or, at any rate, skilled work) and concerned with imparting vocational knowledge. From an epistemological point of view, vocational knowledge is distinct from other



types of knowledge, because it is structured by work contexts and tasks – and thus by an external principle – rather than academic disciplines.

When work-based learning is discussed in the context of VET, it tends to be treated on a par with apprenticeship. While the two concepts are, indeed, closely connected (as apprenticeship always involves a strong WBL component), a distinction does need to be made between them (Maurer, 2018, p. 2). Whereas work-based learning can serve different purposes, such as the acquisition of some narrow and specific skill or the attainment of a full qualification, an ‘apprenticeship’ is a type of training programme. These days, it is chiefly understood as a combination of training in a company and complementary classroom teaching and learning processes (Cedefop, 2014, p. 25), while, historically, the key feature was the pedagogical relationship between the learner and an expert practitioner – a ‘master’ of a specific trade (Markowitsch and Wittig, 2020). Apprenticeship, then, is one of various ways to organise work-based learning. We will return to this topic and take a closer look at the variants of WBL below.

From the point of view of VET stakeholders, such as policy makers, educational institutions, learners and employers, work-based learning is associated with specific advantages. Enterprises may value the fact that workplaces that are conducive to learning tend to be more productive and profitable, since employees have the opportunity to develop and update their skills according to the company’s needs, and to engage in employee innovation to improve the quality of services and products. For learners as well as policy makers, the close connection between learning and the world of work, which can be expected to improve the employability of and career opportunities for learners, will take centre stage. Educational institutions benefit in that the collaboration with enterprises enables an exchange of knowledge and exposes students, as well as teachers, to current production technologies. This helps maintain the quality and labour-market relevance of the training delivered (ETF, 2018a, p. 6).

How, then, can work-based learning be organised and how might VET policy contribute to its successful implementation? Given the lack of a single, universally accepted definition of work-based learning, it is no surprise that there is a variety of approaches to classifying the options for organising WBL. The ETF handbook on work-based learning, for instance, suggests four basic types distinguished according to their relationship (or proximity) to real-life work processes (ETF, 2018a, p. 16):

- arrangements in which the learner has the status of an employee (e.g. formal apprenticeship, alternance training, informal apprenticeship);
- arrangements in which the learner has the status of a VET student (e.g. traineeships, internships or work placements within school-based VET);
- ‘borderline cases’, such as virtual firms associated with educational institutions and training centres; and
- ‘learning about work’ schemes, in which learners are familiarised with the world of work in general, rather than learning how to do a specific job.

The last of these types may safely be excluded from our considerations, since these learning opportunities are not connected to a VET curriculum and aim to prepare the learners for vocational education rather than develop their occupational skills.

1.2 Policy initiatives to strengthen work-based learning

Myriad policy initiatives exist at European Union level to strengthen work-based learning. Priorities for enhanced European cooperation in vocational education and training have been discussed since 2002, when the Copenhagen Declaration was adopted. In particular, the 'Riga Conclusions', endorsed in 2015 as part of the Copenhagen process, have encouraged EU Member States, countries still negotiating to join the EU and EEA countries to 'promote work-based learning in all its forms, with special attention to apprenticeships, by involving social partners, companies, chambers and VET providers, as well as by stimulating innovation and entrepreneurship' (Riga Conclusions, 2015, p. 4). The 2020 Osnabrück Declaration, which sets out the priorities for European cooperation in VET from 2021 onwards, also advocates work-based learning as part of the strategic objective to promote resilience and excellence through good-quality, inclusive and flexible VET. The players at the national level are invited to 'reinforce' work-based learning and apprenticeships through the European Framework for Quality and Effective Apprenticeships – see **Box 1.1** (Osnabrück Declaration, 2020, p. 6). An interesting detail here is the strong emphasis on quality, which shows that the political case for work-based learning is also a case for quality assurance and, therefore, for monitoring and evaluation.

The Osnabrück Declaration complements the [Council Recommendation of 24 November 2020](#) on vocational education and training for sustainable competitiveness, social fairness and resilience. It contributes to the newly updated European Skills Agenda, which recommends EU Member States to deploy actions and investments in accordance with 21 principles. The fourth principle makes explicit reference to work-based learning:

'Vocational education and training programmes at all levels comprise work-based learning components that are further expanded also in continuing vocational education and training; apprenticeship schemes are further developed, to enhance Youth Guarantee offers, and are complemented by appropriate support and measures to stabilise the offer of apprenticeships, and to address specific challenges of small companies; in order to create work-based learning opportunities in different sectors of the economy, incentive measures could be provided for employers in line with national context.'

The Council Recommendation also encourages EU Member States to work towards achieving three major EU-level quantitative objectives by 2025, with the second objective being directly linked to work-based learning.

- The share of employed graduates from VET should be at least 82%.
- 60% of recent graduates from VET benefit from exposure to work-based learning during their vocational education and training. This objective refers to all forms of work-based learning at a workplace and thus will also contribute to increased apprenticeship opportunities, which can be supported with the Youth Guarantee schemes.
- 8% of learners in VET benefit from a learning mobility abroad.



More generally, the Council Recommendation emphasises that vocational education and training should be underpinned by a culture of quality assurance, and it recommends EU Member States to use the European Quality Assurance Reference Framework (the EQAVET Framework) in national quality assurance systems and in all learning environments, such as school-based provision and work-based learning, including apprenticeship schemes, and for all learning types (digital, face-to-face or blended).

The European Commission provides support for structural reforms in work-based learning and apprenticeship through the apprenticeship support service and a reinforced European Alliance for Apprenticeships. The latter was launched in 2013 with the aim of improving the quality, supply, image and mobility of apprenticeships in Europe. The Alliance is a platform managed by the European Commission in close cooperation with EU social partners. It brings together governments and other key stakeholders, such as business associations, individual companies, social partners, chambers of commerce and industry, VET providers, regions, youth representatives and think tanks. The five countries currently negotiating to join the EU (Albania, Montenegro, North Macedonia, Serbia and Turkey) are all part of the European Alliance for Apprenticeships.

BOX 1.1 The European Framework for Quality And Effective Apprenticeships

The [Council Recommendation of 15 March 2018](#) on a European Framework for Quality and Effective Apprenticeships aims to ensure that apprenticeship schemes are responsive to labour-market needs and provide benefits to learners and employers alike (Council of the European Union, 2018). The following criteria are recommended to the EU Member States as a guideline for national regulations:

Learning and working conditions

1. The rights and obligations of the apprentice, the employer and, where appropriate, the training institution should be set out in a written agreement.
2. Stakeholders should establish a comprehensive set of learning outcomes for each apprenticeship scheme.
3. Pedagogical support by adequately qualified in-company trainers and VET teachers should be in place.
4. There should be a substantial workplace component covering at least half of the apprenticeship period.
5. Apprentices should be paid or otherwise receive compensation for their work.
6. Apprentices should be entitled to social protection, including necessary insurance.
7. Workplaces should comply with the relevant regulations on work, health and safety conditions.

Framework conditions

8. A clear and consistent regulatory framework should be in place.
9. The social partners should be involved in the design, governance and implementation of apprenticeship schemes.
10. Financial and/or non-financial support should be available for small and medium-sized enterprises to enable cost-effective apprenticeships.
11. Flexible learning pathways and mobility of learners should be supported through recognition of prior non-formal and informal learning, opportunities for progression from apprenticeship to further learning, and opportunities for training abroad.
12. Career guidance for learners and awareness-raising activities to promote the attractiveness of apprenticeships should be in place.
13. Transparency of and access to apprenticeship opportunities in and between Member States should be facilitated by the national labour-market agencies.
14. Quality assurance measures and procedures for tracking the employment and career development of apprenticeship graduates should be in place.



2. Monitoring and evaluation as part of good governance of work-based learning

2.1 Good governance and the need for feedback

Implementing work-based learning in VET is a part of VET policy and thus a matter of governance. In this handbook, governance is understood as the continuous process of preparing and implementing political decisions, i.e. decisions on specific policies, rules or regulations (ETF, 2018, p. 70). Governance issues may include decisions on educational priorities, e.g. which educational sectors should be expanded or which skills are needed most for the national economy; decisions on the content of curricula and programmes; provisions for the operation of and cooperation between educational institutions; regulations for access to learning opportunities; and arrangements for the involvement of different stakeholders in decision-making. The quality of governance structures and processes has long been a topic for debate among researchers and policy makers alike, and certain standards of 'good governance' have been identified for various policy areas as a result. In the area of VET policy, the following are commonly regarded as characteristics of good governance (ETF, 2018, p. 72; see also ETF, 2019a, p. 7):

- representation of all relevant stakeholder groups affected by the policy in question;
- active involvement of key stakeholders such as social partner organisations (employers, trade unions) in the design of policy schemes;
- clear allocation of responsibilities and accountability of players;
- selection of the appropriate level for the policy (e.g. national, regional or sectoral level);
- clear objectives for the policy and information on its impact;
- coordinated decisions to ensure consistency of measures.

These principles also apply to the governance of VET that includes work-based learning. They suggest that the successful implementation of WBL depends not only on careful planning but also on reliable information regarding the effectiveness of the measures implemented. This means that good governance of work-based learning in VET requires some kind of feedback – internal and external.

The importance of such feedback for work-based learning and its successful implementation can be illustrated by the 'curriculum value chain' (CVC) model developed by Renold et al. (2014; 2015), which describes how information on educational attainments and labour-market integration is used for designing and updating VET curricula. The main idea is a linkage or 'coupling' of two social systems – the VET system and the labour market – that basically function independently of each other and according to their own logic.



The CVC model describes the life cycle of a VET curriculum as a process with three phases: curriculum design, application (or implementation) and updating. In the design phase, the contents of the curriculum, which are supposed to reflect the skills needs of enterprises, are set out. In the application phase, VET teachers and trainers translate the curriculum into training activities, imparting knowledge, skills and competence¹ to learners. This phase leads to educational outcomes in terms of the learners' successful transition into employment and/or their progression within the education system. These are the outcomes used to provide feedback for the 'updating' phase, in which the actual learning outcomes of the VET programme are evaluated against the backdrop of the original targets. Depending on the results of this comparison, the curriculum may subsequently be revised and updated to comply as fully as possible with the requirements of the labour market.

The feedback required for the quality assurance of measures such as the implementation of VET curricula does not necessarily have to result from a formal process involving data collection. Depending on the flexibility of the institutions concerned, end users, especially employers, could provide information on the spot regarding their satisfaction with the skills delivered and prompt the training providers to modify their programmes as necessary. This immediate feedback is possible in situations where education and training providers have a close relationship with employers and other labour-market players, and have sufficient autonomy to make decisions in matters of curriculum design. These conditions may apply in countries with decentralised VET systems, in which training centres and similar institutions enjoy a high level of autonomy, but also in smaller countries, where communication channels between stakeholders and policy makers are relatively short.

In Denmark, for example, direct feedback from the labour market to the education system is possible. VET in this country follows the model of alternating practical training in a company and theoretical instruction in a VET college. The social partners and the public sector share responsibility for organising and developing VET, which is reflected in the representation of the social partners in governing bodies at the national, sectoral and local levels. The VET system is decentralised in the sense that VET colleges have considerable autonomy in designing their own curricula according to nationally established guidelines or targets. In doing so, the colleges cooperate closely with representatives of local enterprises and social partners via local education committees. This structure gives employers the opportunity to communicate their skills requirements to the training providers, which means immediate feedback can be provided on the effectiveness of the training programmes and any necessary adaptations can be made (Cedefop, 2013, p. 76).

Formal monitoring and evaluation procedures may therefore not be necessary or suitable in all circumstances. As a rule, however, the development of a sound knowledge base through systematic data collection can be regarded as a useful instrument for quality assurance and evidence-based policy making.

¹ In this handbook, the term 'competence' is applied in a wide sense, encompassing not only behavioural patterns and attitudes but also the ability to apply knowledge and skills according to a given standard.



2.2 Monitoring and evaluating vocational education policy

So, in order to safeguard the effectiveness and success of policy measures aimed at promoting work-based learning, their implementation needs to be monitored and their results evaluated. First, however, the terms ‘monitoring’ and ‘evaluation’ need to be clarified, as they describe different activities, as discussed below (see Section 2.3 and Chapter 3). While the methods and techniques that can be applied in both cases are the same, the objectives differ. Evaluation focuses on a specific problem and takes place over a limited period of time. Monitoring, by contrast, is a permanent scheme of regular and periodic assessments. While evaluation implies a judgement on the attainment of some goal, monitoring involves continuous data collection over time, with a focus on identifying changes and trends without making any judgement (Sager and Hinterleitner, 2014, p. 439). Monitoring, then, is mostly relevant for supplying information for the ongoing implementation and management of programmes and policies. Evaluation, on the other hand, serves to estimate the success of a specific intervention and informs the choice and design of future programmes and policies (Khandker et al., 2010, p. 8).

This specific purpose of evaluation, as opposed to monitoring, involves an epistemological and methodological challenge, namely the problem of counterfactual analysis. Strictly speaking, and from a logical point of view, assessing the effectiveness and impact of a given intervention requires knowledge about what would have happened if the measure in question had not been taken. This, in turn, requires an experimental design for the evaluation, in which the target group for the intervention is compared with a control group that has not been exposed to that intervention. In practice, however, such a design is difficult to implement, for various reasons (e.g. sampling problems) and, in many cases, a more modest design will have to be adopted. Instead of ‘demonstrating’ the causal effect of a certain measure, its impact may be illustrated by multivariate analysis techniques, such as regression analysis. (The methodological options for analysing the effects of work-based learning are discussed in Chapter 7.) In any case, reliable data on the implementation of training programmes and the labour-market status of learners are required. For this reason, systematic data collection should be in place before evaluation activities can be taken into consideration. In short, monitoring needs to precede evaluation (Werquin, 2019, p. 73).

To design monitoring and evaluation procedures, target groups and stakeholders need to be clarified, which also involves defining the exact purposes of each procedure. This means that there must be clarification beforehand of who is supposed to use the results and to what end, and whose perspectives should be included in the evaluation procedure or monitoring mechanism. It is likely that different players will have different priorities and interests when assessing the quality and performance of work-based learning. From the point of view of some VET policy makers, for instance, the effectiveness of work-based learning (and VET in general) may have to be assessed firstly, if not exclusively, in terms of the learners’ integration into the labour market. This may be the point of view of government bodies concerned with economic and labour-market issues, e.g. ministries of economic affairs and labour, or national employment agencies. Policy makers and institutions in charge of education policy in a wider sense, by contrast, may prioritise the pedagogical quality of programmes and the opportunities for learners’ intellectual and personal development, as well as their progression within the education system (Hayward and Hoelscher, 2011). Similarly, players at the implementation level, i.e. training providers and companies, will have different perspectives. Vocational schools and, to some extent, training providers may be interested in minimising dropouts and



securing high completion rates, which, while being a rational objective, risks compromising the real value of the qualifications awarded. Employers expect the skills delivered by WBL programmes to correspond as closely as possible to the requirements of their business processes, while learners may be interested in a broader set of knowledge and skills that give access not only to employment but also to further education. As all these perspectives are legitimate quality-assessment dimensions, they should all be taken into account, in a balanced way, in the formulation of an analytical framework for the evaluation of WBL. This also implies that data collection is required, to make sure that information from all relevant stakeholder groups is fed into the process.

2.3 A framework for monitoring and evaluating work-based learning

The general framework for both monitoring and evaluation is the IPOO model, which distinguishes between the 'input', 'process', 'output' and 'outcome' components of the scheme in question. The characteristics to be analysed are identified and assigned to these categories based on the hypothesised causal relationship between them (Brown and Svenson, 1988; Heidegger, 2008). 'Input' covers all the arrangements preceding actual implementation, as well as the resources that feed into the process. The 'process' factors are those that are directly related to the intervention and the production of the targeted goods or services. The immediate results in terms of goods or services produced, e.g. the knowledge, skills and competence imparted to the learners, constitute the 'output'. Finally, the medium- and long-term effects achieved through the use of the output are referred to as the 'outcome' (for the distinction between output and outcome in VET, see also Kurz, 2018, p. 845). In the case of work-based learning, these four dimensions can be represented by various characteristics that relate to the overall governance and financing structures at the systemic level, the cooperation between enterprises and other institutions involved, as well as the learning process itself and its immediate and long-term effects on the learner. The example of dual VET in Montenegro below illustrates this analytical framework.

Most countries are familiar with monitoring and evaluation of school-based vocational education and training. For example, they monitor enrolment, dropout and completion rates, and look at student-teacher ratios and the financial resources that are invested in equipment and buildings. Many of these indicators, such as dropout and completion rates, are equally important for the monitoring of work-based learning. However, when countries introduce new programmes or systems with a substantial work-based learning component, new questions may emerge and the indicators used for monitoring school-based VET may no longer be sufficient.

COUNTRY EXAMPLE Montenegro – dual VET

Montenegro has recently introduced a new type of dual education programme for students, following an initiative of the Ministry of Education to implement the amendment to the Law on Vocational education².

The VET system in Montenegro offers three different types of programme: lower VET (two years), secondary VET (three and four years) and post-secondary VET (two years, following secondary VET). Most of the three-year programmes (18 out of 29 in 2019/20) are also offered in dual form, with compulsory work-based learning.

The learners in dual education spend one day per week at the workplace in their first year, two in the second year and three in the third year. Students in regular three-year VET programmes, on the other hand, complete several weeks of internship per year, but acquire most of their practical skills at the vocational school.

In-company training is planned jointly by the school coordinators (generally, the practical-training teachers) and the in-company tutors. A pedagogical course has been developed for in-company tutors. The Ministry of Education subsidises the pay of students in dual education to the value of at least 10% of the minimum net wage in the first grade, and at least 15% in the second grade, while employers have to cover year three (at least 20% of the minimum net wage).

Dual education programmes are popular with employers and students alike. In 2017/18, there were 277 enrolments. In 2019/20, 848 students were being trained with 280 employers in 18 different occupations, e.g. chef, waiter, mechanic, electrician, salesperson, hairdresser, sanitary equipment and heating/air-conditioning fitter.

² Law on Vocational Education, *Official Gazette of the Republic of Montenegro*, 64/02, 49/07, 45/10, 39/13 and 47/17.

The following figures illustrate some examples of monitoring and evaluation questions that may arise when introducing a new type of work-based learning programme, such as the new dual education programme in Montenegro. Note that these examples are by no means exhaustive. The questions are presented separately for each level of the IPOO model.

FIGURE 2.1 Monitoring and evaluation of work-based learning: issues related to input and process

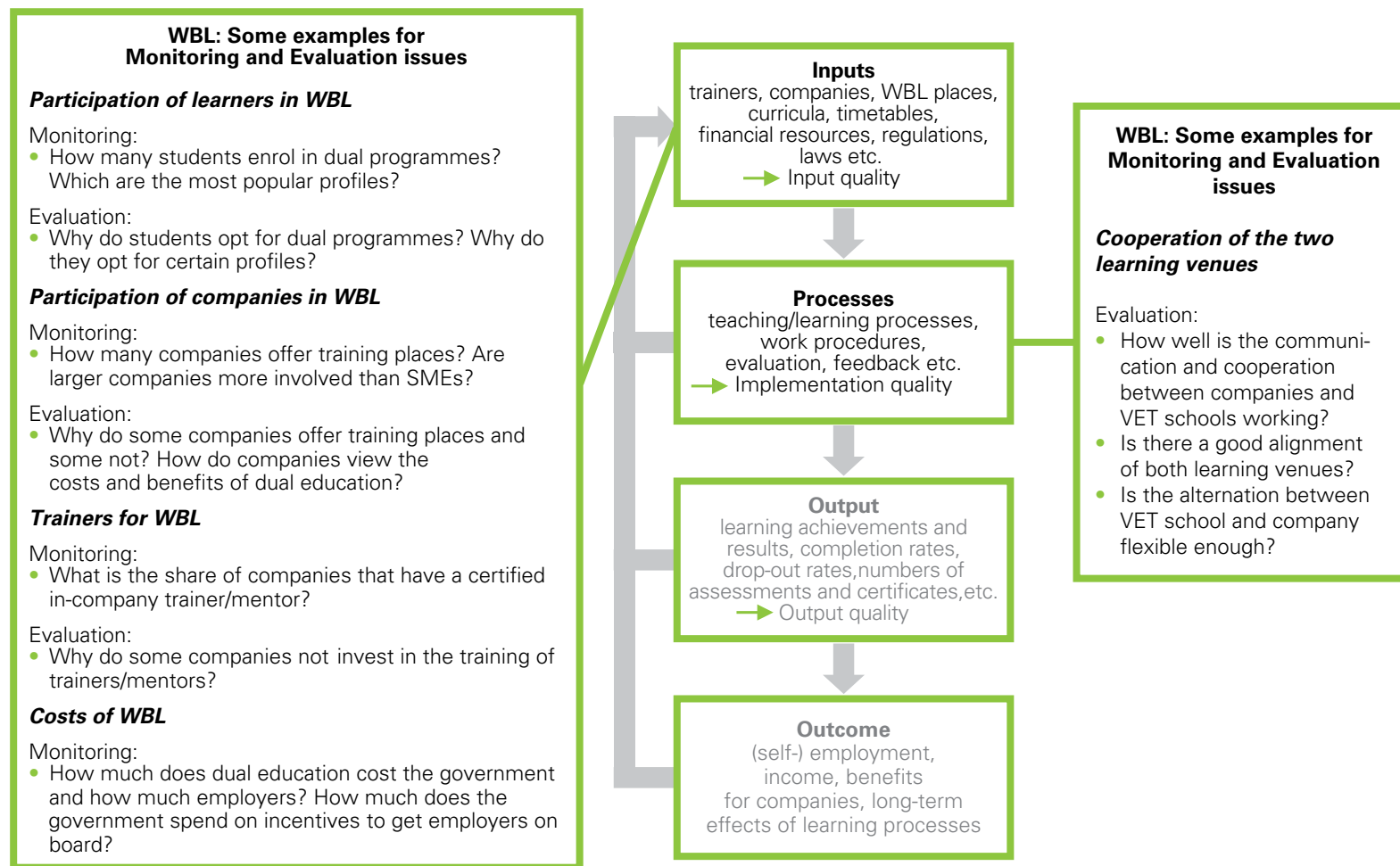
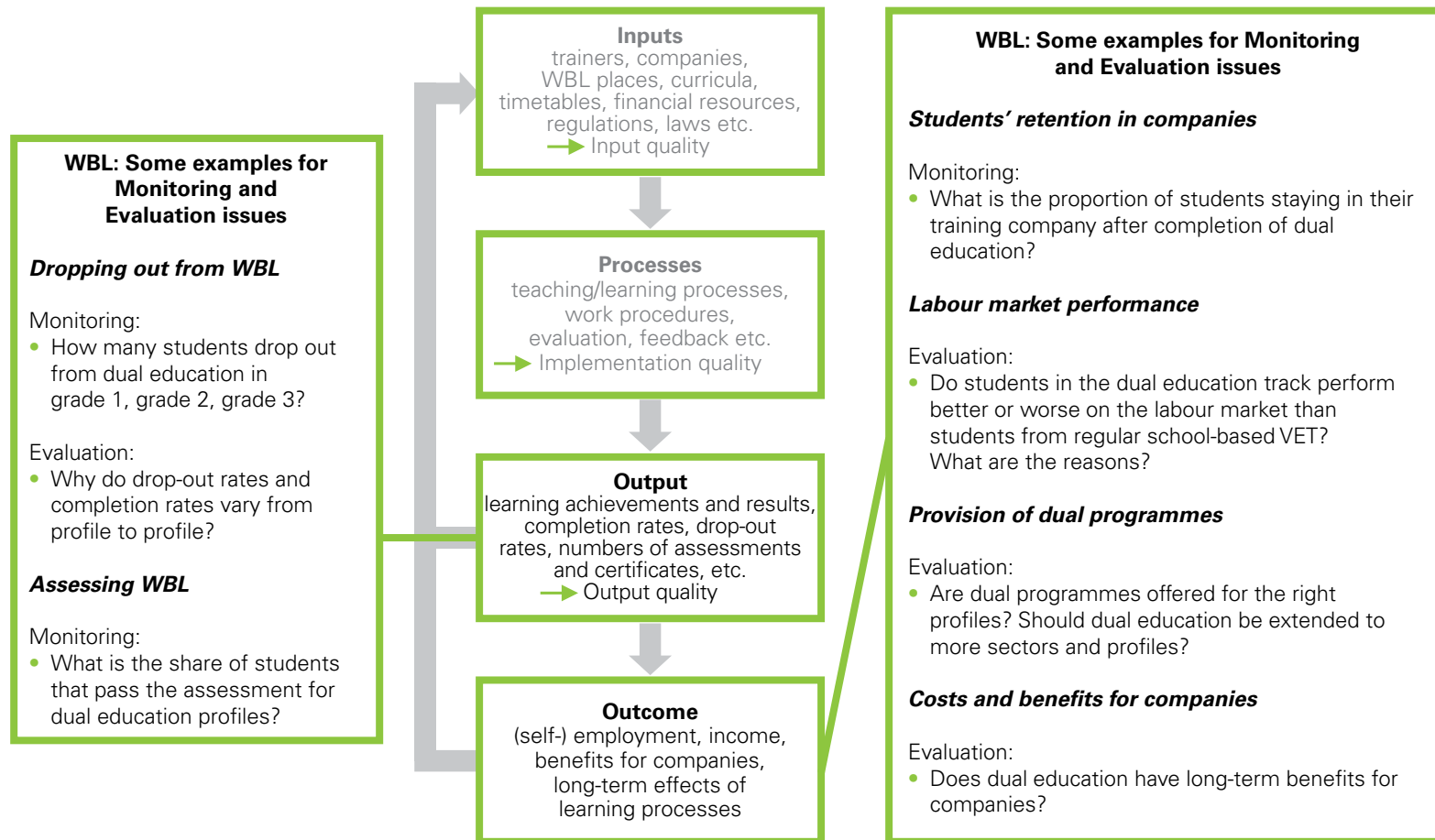


FIGURE 2.2 Monitoring and evaluation of work-based learning: issues related to output and outcome





3. Indicators and tools for monitoring and evaluating work-based learning

The IPOO model described in the previous chapter can be used to structure the main issues related to monitoring and evaluating the implementation of WBL programmes. Some of the key questions that arise at the different stages of the WBL process were presented in the example from Montenegro above. This chapter is devoted to the indicators and tools that may be applied at the different stages. **Table 3.1** below, which can also be regarded as a preview of this chapter, illustrates some examples of data collection tools, i.e. monitoring tools, and methods for verifying causality and ‘attributing change’, i.e. evaluation methods, which could be used at the various levels of the value chain. These tools are described in greater detail in Chapters 4 and 7.

TABLE 3.1 Overview of monitoring tools and evaluation methods for work-based learning

IPOO model components and relevant characteristics of WBL	Examples of data collection tools (monitoring tools)	Methods for verifying causality (evaluation methods)
Inputs		
• Supply of and demand for job placements • Costs (and benefits) of dual education • VET curricula • Skills and qualifications of training staff	• Statistical data, e.g. national database where interested employers and students register • Survey among employers and students • Cost-benefit survey • Curricular analysis, e.g. number of hours dedicated to WBL • Registries, e.g. number of trainers involved in WBL; qualifications of training staff	• Trend surveys, e.g. skills anticipation analysis • Qualitative designs, e.g. case studies with employers on skills needs



IPOO model components and relevant characteristics of WBL	Examples of data collection tools (monitoring tools)	Methods for verifying causality (evaluation methods)
Process		
• Employer involvement in the selection of learners • Cooperation of learning venues/ consistent implementation of the curriculum • Practice-oriented assessment	• Survey among employers and vocational schools • Analysis of curriculum documents (intended curriculum) and implemented curriculum	• Assessment of VET curricula implementation (e.g. survey among teachers and in-company trainers)
Outputs		
• Completion of programme • Dropout • Contribution to the business processes of training enterprises	• Statistical data, e.g. number of exams passed by profile/programme	• Trend survey • Qualitative design • Longitudinal studies • Cost-benefit analysis
Outcomes		
• Performance in the labour market • Lifelong learning and professional development • Economic return on investment by private companies	• Tracer studies • Surveys about participation in continuing vocational training • Statistical data, e.g. from national employment agencies	• Experimental design, e.g. employment effects of dual VET programmes vs school-based programmes • Quasi-experimental design • Longitudinal studies, e.g. long-term analysis of companies' training behaviour • Long-term cost-benefit analysis, e.g. recruitment costs



Experimental design and **quasi-experimental design** are classic strategies that can help attribute change – for instance, better employment opportunities or higher income for students on a new apprenticeship scheme – to one or several causes. A higher income for graduates, for example, may be the result of their improved skills but also of an upturn in the economy or other reasons. The two design strategies try to answer what would have happened to the students had they not participated in the new apprenticeship programme (Meyer and Thomas, 2012, pp. 31ff.).

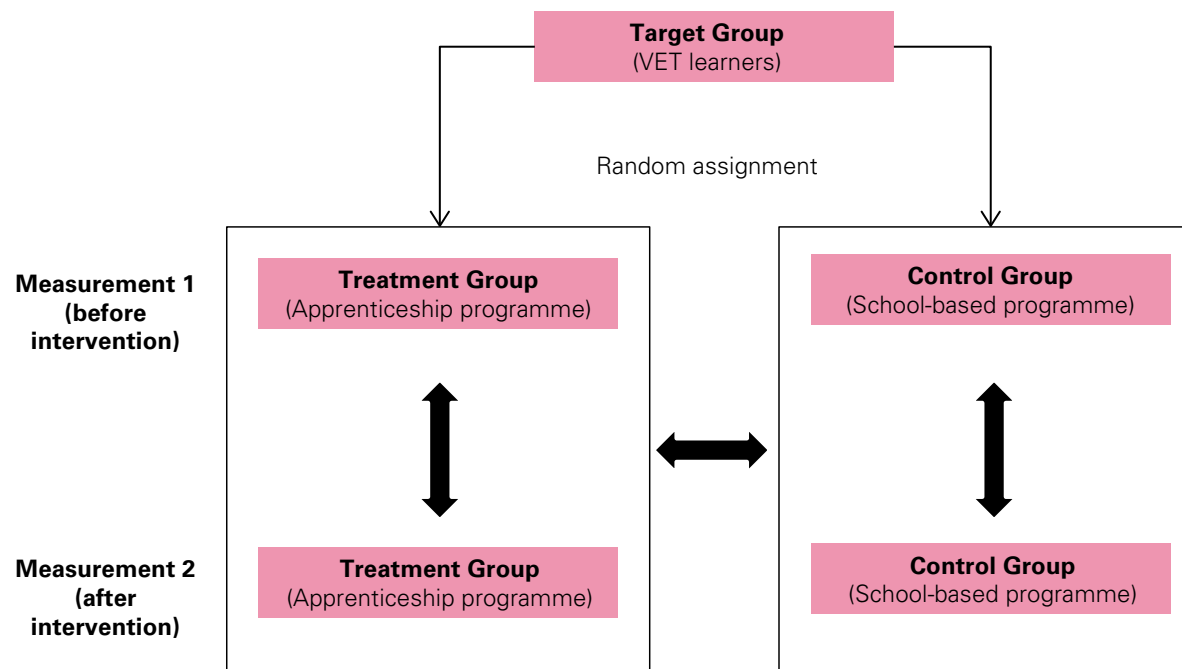
- **Experimental design:** ‘If a new education concept is to be tested, we can establish two groups. While one group is trained following the concept used so far, the training of the other group follows the new concept. The participants are randomly selected and assigned to one of the groups (randomisation) prior to the intervention – in other words the implementation of the training. Before and after the training a performance test is conducted, which can provide information about changes the intervention could bring about. Because of the random assignment the group results can now be mathematically separated from the effects of the intervention and conclusions drawn on the causality.’ (See **Figure 3.1**)
- **Quasi-experimental design:** ‘In practice, it is often difficult or even impossible to establish two groups by random assignment and to keep the conditions of both groups constant between the before and after measurements. If, for instance, two training classes are established for an experiment, not only the participants must be randomly assigned to the group but all other factors (e.g. trainers, rooms, teaching material) must be the same or as similar as possible, so that the differences measured between the two groups and the times of measurement can be conclusively attributed to the intervention (attribution). ... It can be generally said that the probability of not being able to fulfil the optimal conditions for an experiment increases with the complexity of the influencing factors and the time span between the measurements. In this case it is common to speak of a “quasi-experiment”, which differs from an experiment in the limited control and the non-random assignment of the participants in both experimental groups. The two groups to be compared are selected following theoretical considerations, with the aim of having two groups that are as similar as possible to each other and only differing in terms of the intervention. As opposed to an experiment, these are real, existing groups, which are not artificially established for the sole purpose of the assessment.’

Longitudinal studies: Repeated measurements make it possible to estimate the development trends for relevant characteristics such as employability of learners or companies’ training practice. Usually, they compare the situation at different points in time, e.g. before and after a specific event, such as a reform of VET programmes. If the measurements after the intervention provide consistently different values than before the intervention, this allows the existence of a causal relationship between this developmental change and the intervention to be inferred. This may be done using aggregated data (trend survey), as well as individual data (panel survey).

- **Trend surveys,** for instance, can use average marks in final or intermediary exams to ascertain the extent to which the employability of participants of reformed training programmes has improved collectively. It is important to ensure that the tests are adapted on a regular basis, since employability is not an absolute and constant trait. It evolves as the employers’ requirements change.

- **Panel surveys** may target learners or companies and so can be used to follow individual education and employment paths, or changes in the training practice of single employers. This may be used to ascertain who benefited from the new didactic approaches set out by a reformed training course and who did not (adapted from Meyer and Thomas, 2012).

FIGURE 3.1 Experimental design



Source: Adapted from Meyer and Thomas, 2012, p. 31



4. Prerequisites for work-based learning (input)

4.1 Support from companies and learners

The feasibility of work-based learning depends on the availability of training places in enterprises. Companies need to be able to provide an adequate number of training places or learning opportunities connected to their business operations. On the other hand, there needs to be a corresponding demand for training places on the part of prospective learners, i.e. enough young people need to be motivated to join a WBL programme rather than opt for immediate employment as semi-skilled workers or pursue further education. The willingness of employers and learners alike to participate in WBL schemes is thus a prerequisite. This participation can be monitored and described using a variety of indicators. Depending on the structure of the VET system in a given country, different indicators will be suitable or not.

4.1.1 Participation of companies

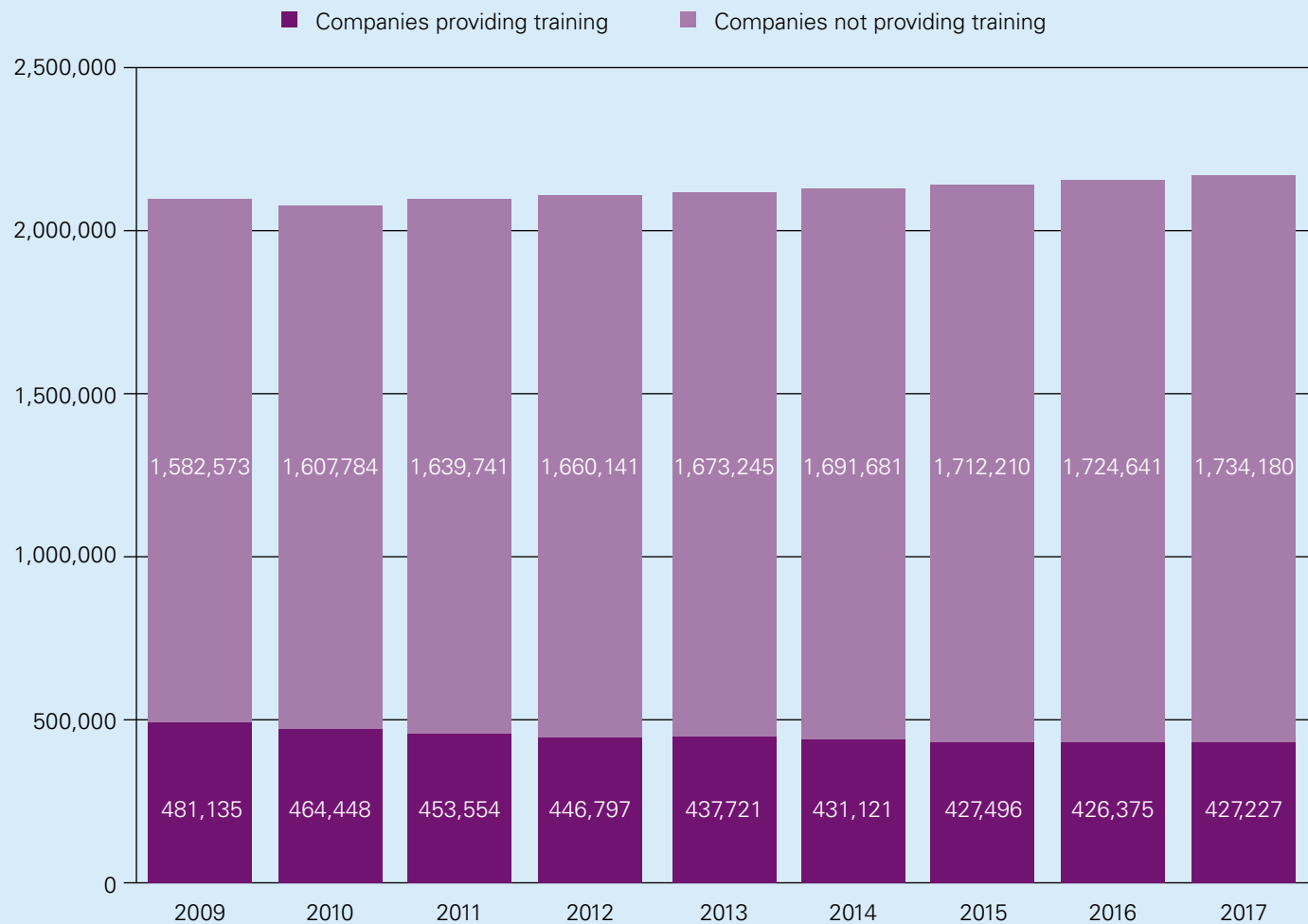
Starting with the participation of employers, one measure that has to be considered is the proportion of companies hiring apprentices or trainees out of all companies. This indicator gives a basic understanding of the relevance and acceptance of training and work-based learning among employers, and, hence, of the general feasibility of WBL from the 'supply' perspective. A straightforward way to determine the share of training companies is to use the number of companies whose staff includes apprentices or other employees specifically hired for training as the *numerator*, and the total number of companies as the *denominator*. This is the approach taken, for instance, in the German VET reporting system (Hucker and Troltsch, 2012, pp. 44–5).

The **company participation rate** is an indicator that can be easily applied in most country contexts. However, the numerator and the denominator of the indicator must be clearly established and data must always be collected on the same cut-off date.

COUNTRY EXAMPLE Germany

Germany has a long-established practice of monitoring and evaluating the participation of enterprises in its apprenticeship system. In 2017, the total number of companies providing training in the dual system was 427,227, while the total number of companies not providing training was 1,734,180. **Figure 4.1** shows that the negative trend evident since 2009 was interrupted for the first time in 2017.

FIGURE 4.1 Companies that do and do not provide training in Germany's dual system, 2009–17



Source: BMBF, 2019, p. 40

The most prominent indicator for measuring company participation in the dual system is the proportion of companies providing training. This indicator uses as the numerator the number of companies providing training contracts in the dual system. The denominator is the total number of companies that have at least one employee who is subject to social insurance contributions. The indicator includes companies from both the private and the public sectors.

$$x = \frac{\text{Total number of companies providing training}}{\text{Total number of companies with employees subject to social insurance contributions}} \times 100$$

Here below is an example of calculation of the company participation rate in Germany (dual system) for the year 2017:

$$x = \frac{427,227}{(1,734,180 + 427,227)} \times 100$$

In 2017, the overall company participation rate was 19.8%. More detailed analysis is possible by breaking down the data by company size, economic sector and regions. Not surprisingly, the results from 2017 show that four out of five large companies (80.7%) provided training, but only 11.5% of very small companies did so.

TABLE 4.1 Company participation by company size, 2017

Company size	Participation (%)
Very small companies (1–9 employees)	11.5
Small companies (10–49 employees)	42.7
Medium-sized companies (50–249 employees)	65.7
Large companies (250+ employees)	80.7

Source: BMBF, 2019, p. 40

Time-series analysis can help identify positive or negative trends. The relatively low participation rate of very small German companies in the dual training system is nothing new, for example. In fact, **Table 4.2** shows that the participation rate fell from 15.9% in 2009 to 11.2% in 2018. The number of companies providing training decreased from 263,294 in 2009 to 187,759 in 2018, although the total number of very small companies has remained more or less unchanged.

TABLE 4.2 Very small companies (1–9 employees) offering training in the dual system: total number and participation rate, 2009–18

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total companies	1,653,446	1,654,722	1,664,436	1,670,445	1,668,601	1,671,587	1,675,301	1,675,052	1,674,337	1,669,463
Training companies	263,294	248,703	235,676	225,071	215,345	207,016	200,034	195,789	192,157	187,759
Participation rate (%)	15.9	15.0	14.2	13.5	12.9	12.4	12.0	11.7	11.5	11.2

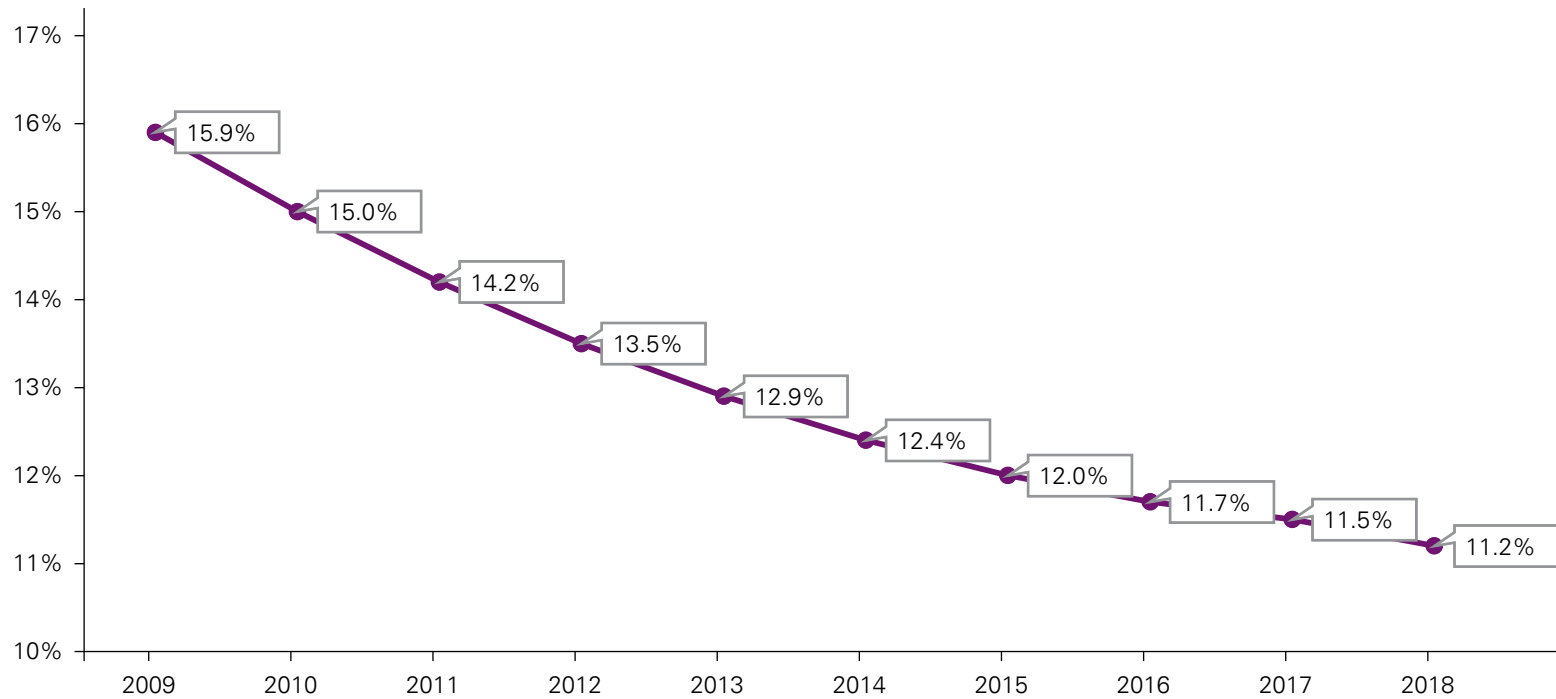
Source: BMBF, 2020, p. 26

The low participation of very small companies in training is a challenge that Germany shares with many other countries – in particular, EU neighbouring countries in which the transition to a market economy still has some way to go – and that regularly draws the attention of policy makers in the vocational education and training sector. The reasons why very small companies do not train can be manifold. In some cases, very small companies fear the costs and paper-work of getting involved in training or they lack pedagogical and financial support. In other cases, they might be willing to train but they cannot find suitable applicants or the right number of applicants.

4.1.2 From monitoring to evaluation: why companies train or do not train

In Germany, the sharp decline in the number of very small companies participating in the dual system led to a special survey, conducted in 2019 by the Federal VET Agency (BIBB) and the Bertelsmann Foundation.

FIGURE 4.2 Participation of very small companies (1–9 employees) in the German dual system



Source: BMBF, 2020, p. 26. Chart: ETF



More than 4,000 companies – both those that do provide training in the dual system and those that do not – participated in this representative survey, which was part of an annual company panel survey that has been conducted at regular intervals since 2011³. Companies were asked why they are reducing their training activities and which of the support measures that are offered in the dual system they are using. Based on previous research (Mohr, Troltsch and Gerhards, 2015), the survey looked at three main reasons and sixteen sub-reasons why companies provide less or no training in the dual system.

- Applicant-related reasons: companies have difficulties in finding suitable apprentices (applicants).
- Demand-related reasons: the demand of companies for skills has changed or companies use other ways of recruiting skilled workers.
- Organisational reasons: companies can no longer – or no longer want to – provide training owing to organisational and cost-related developments.

The survey reveals that employers reduce their training activities mainly for applicant-related reasons. Almost half the companies said they were not able to find suitable candidates among those that had applied for an apprenticeship; 42% said they had received few or even no applications; and 29% think that the training occupations or profiles they offer are not attractive enough for young people. More than a fifth (22%) stated that the search for suitable applicants takes too much time and is too costly. **Figure 4.3** depicts the results of the survey across the 16 sub-reasons, broken down by company size. The questions were answered only by those companies that had reduced or stopped their training activities (dual system) within the last three years.

³ BIBB establishment panel on qualification and competence development, see: www.bibb.de/en/1482.php

FIGURE 4.3 Reasons why companies in the dual system reduce their training activities (%)

		1–9 employees	10–19 employees	20–199 employees	≥200 employees	Total
Applicant-related reasons	Have not received suitable applications	50	41	47	31	49
	Have received less or no applications	41	44	44	29	42
	Profiles are not attractive for applicants	30	24	33	24	29
	Search for applicants too costly	26	4	12	4	22
	Training position was offered but not taken up by candidate	20	16	23	15	20
Demand-related reasons	Rather need already fully trained specialists	34	36	46	16	35
	No demand for self-trained specialists	31	24	23	29	30
	Apprentices have left the company frequently on his/her own request	27	14	20	19	25
	Would not be able to employ our apprentices after graduation	27	8	20	32	24
	Rather employ low-skilled workers	11	5	10	7	10
	Rather employ professionals with a Bachelor degree	4	12	10	13	5
Organisational reasons	Could not supervise trainees intensively enough	21	20	16	14	20
	Vacant training positions could not be filled in the past	18	26	19	14	19
	Fewer opportunities to use apprentices productively	20	10	15	8	18
	The cost of training has increased	18	1	11	10	16
	Not all training content could be taught	11	19	11	11	12

Source: Eckelt et al., 2020, p. 16. Translation and chart: ETF



4.1.3 Supply of and demand for training places

In certain circumstances, the support that work-based learning receives from companies and enterprises can also be described in terms of supply and demand, i.e. the state of the market in terms of training places (Ulrich, 2012). The supply of training places, meanwhile, can be defined as the number of training contracts or similar agreements concluded between enterprises, learners and, if applicable, training institutions plus the number of training places or similar learning opportunities that have been reported by the enterprises to the labour market service but have not been filled by a specific deadline. This number is used as the numerator. Likewise, the demand, which serves as the denominator, can be understood as the number of newly concluded training contracts or similar agreements plus the number of people who have registered with the labour market service as applicants for a training place but did not find one.

The resulting **supply and demand ratio for training places** is an indicator of the capacity of the VET system to offer prospective learners adequate opportunities for in-company training and, hence, work-based learning. This measure is part of the official VET reporting system in Germany under the Vocational Training Act (Ulrich, 2012, pp. 48, 52). On the whole, it can be regarded as an important indicator of the performance of the apprenticeship market and, therefore, of the feasibility of work-based learning. On the other hand, however, it is not applicable in predominantly state-centred VET systems, where learning opportunities are not allocated through market mechanisms at all. One possibility is a nationwide reporting system on the supply of and demand for training places, based on a register of training places, which could be hosted by the national labour market service. Data on school-leavers in search of a training place could also be collected through national employment agencies. In any case, a coordinated network of institutions in charge of collecting and processing information on the training market (public and private employment agencies, chambers of commerce and industry) needs to be in place.

Again, however, measuring supply and demand in this sense presupposes a market-based distribution of apprentices among companies, and this is not very common, as, in many countries, the VET systems in place integrate WBL into school-based programmes. The nature of these systems and how they work vary between countries. In the Netherlands, for example, the system includes both school-based and work-based options; in Denmark, it differs within programmes between different learners; and in the Slovak Republic, an apprenticeship option has only recently been re-introduced.

Therefore, an indicator that reflects the number of trainees in line with the needs of the labour market is required, including the number of companies providing training, the number of training places at schools and the number of interested trainees.

To shed some light on this issue, we take a look at how supply and demand in work-based learning is monitored in the Netherlands.



COUNTRY EXAMPLE The Netherlands

In the Netherlands, there are two options for vocational training at upper secondary level. Learning periods can last from one-and-a-half to four years, depending on the training path chosen. On the one hand, training can be undertaken part-time, predominantly in-company (at least 60 % of the learning period). In this case, the trainees conclude a training contract with the training company (Beroepsbegeleidende Leerweg, BBL). On the other hand, there is the option of the vocational training path, in which a training contract is concluded between the trainee and the vocational school (Beroepsopleidende Leerweg, BOL). Most of the learning time is spent in regional vocational training centres (training in-company accounts for between 20% and 60%). Both training paths are offered on the basis of the same vocational curriculum and the diplomas awarded are equivalent (Busse et al., 2016, 31ff.).

The advantage of this system is that regional, demographic or economic changes can be offset against each other. For example, if the supply of in-company training places drops, the volume of full-time school-based training automatically increases. This enables greater flexibility between supply and demand (ibid., 46f.).

The introduction of a national training or occupational structure is key, as it forms the basis on which vocational training is structured, coordinated and managed. Therefore, the sector chamber (sectorkamers), in cooperation with the private sector and the social partners, initiates the development of national standards and the qualification dossier for education. The regional training centres use these standards to develop their respective curricula for qualification in schools and companies (ibid.).

The Foundation for Cooperation on Vocational Education, Training and Labour Market (Samenwerkingsorganisatie Beroepsonderwijs Bedrijfsleven (SBB)) provides data for this purpose. Data are based on regular surveys of trainers or the contacts within companies for professional practice formation (beroepspraktijkvorming (BPV)), as well as of students at the end of a BPV period⁴.

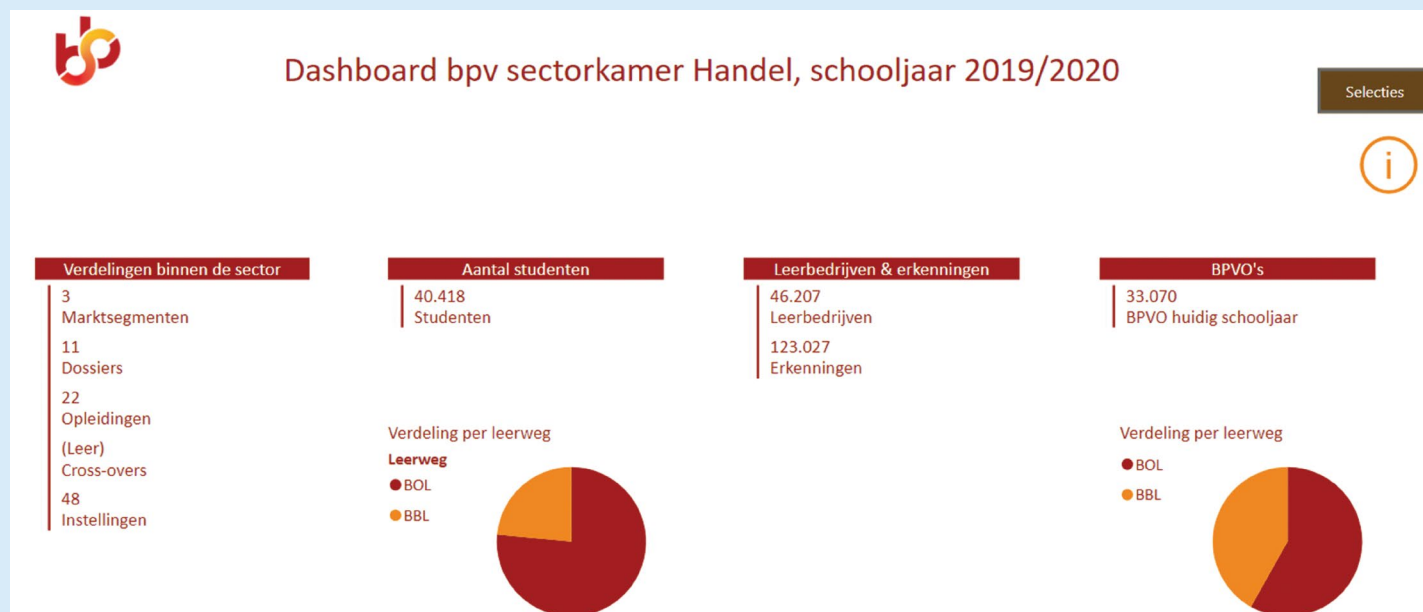
With this survey, the so-called BPV Monitor, vocational education and industry continuously measure the quality of internships and apprenticeships by training programme, school, sector and occupation.

Reports can easily be generated on a sector-by-sector basis, as illustrated below.

In the 2019/20 school year there were 501,904 VET (abbreviated to MBO in Dutch) students, of whom 74% followed the vocational training path (BOL) and 26% followed the vocational guidance path (BBL).

⁴ Beroepsonderwijs & Bedrijfsleven:
www.s-bb.nl

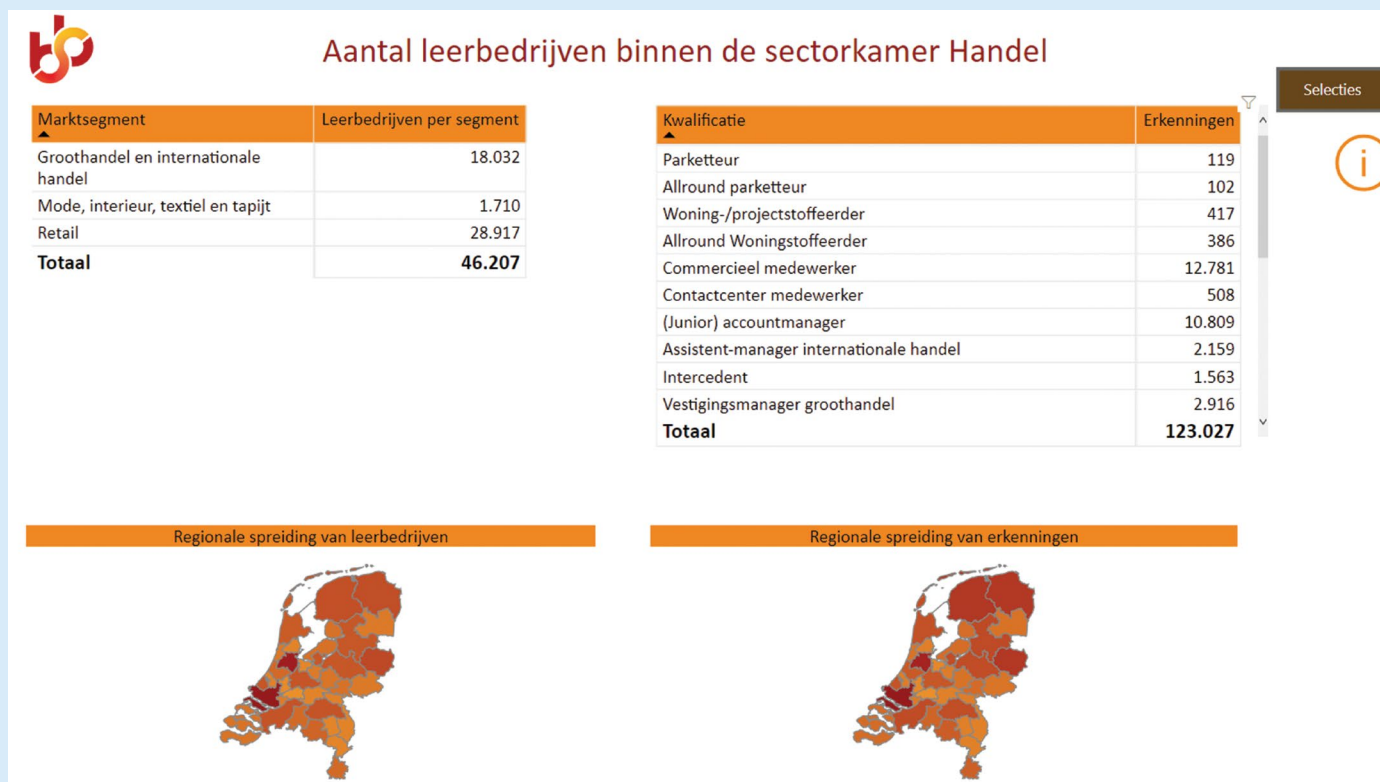
The figure below depicts the 'trade' sector of the economy in 2020.



Source: Beroepsonderwijs & Bedrijfsleven

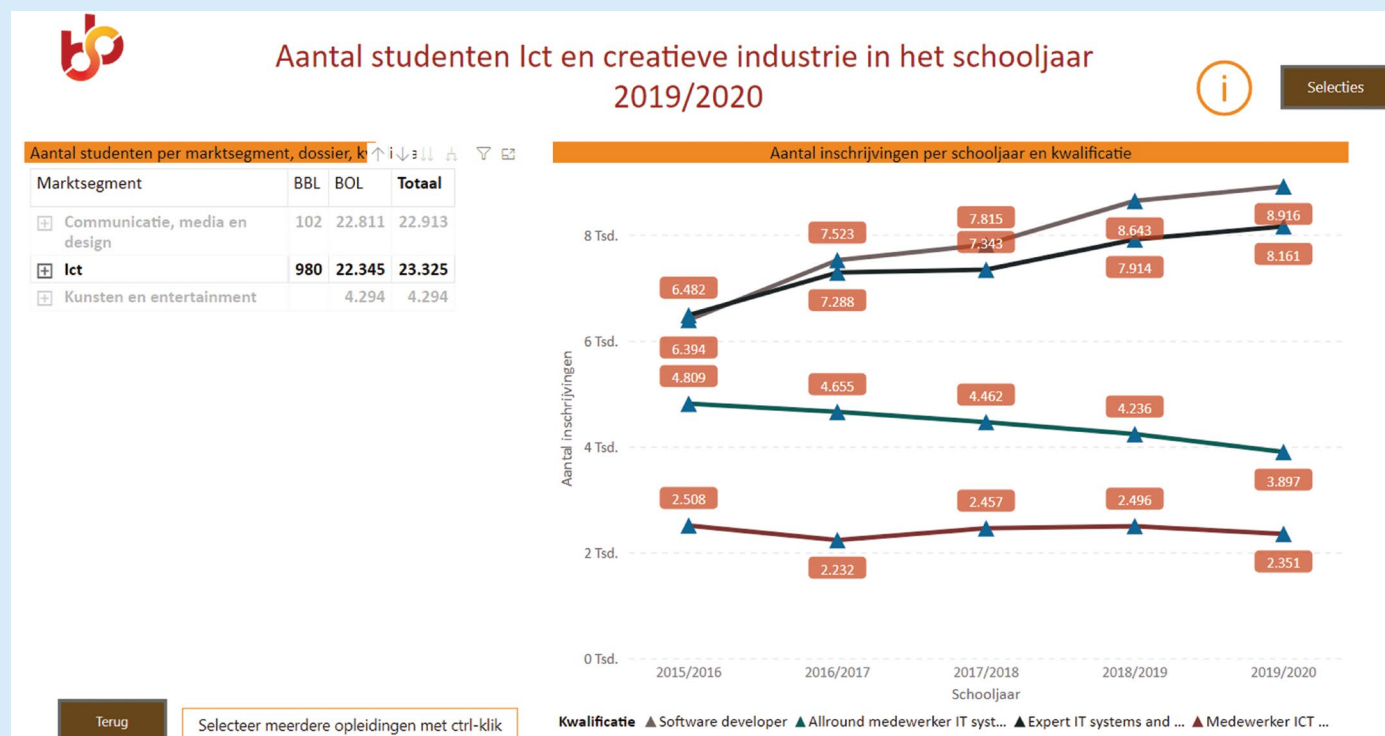
The data provide a differentiated view of the sector. It consists of three market segments (Marktsegmenten) and 11 qualification dossiers based on occupational profiles that cover several qualifications at different levels (Dossiers). In addition, 22 study programmes (Opleidingen) are offered in both paths, BOL or BBL, in the 48 regional training centres/ vocational schools (Instellingen). Furthermore, the diagram shows that the sector accommodates 40,418 apprentices (Studenten). The pie chart on the left indicates that around three-quarters of these are in school-based training (BOL) and one-quarter in part-time vocational training (BBL). In contrast, there are 46,207 acknowledged training companies (Leerbedrijven) offering 123,027 accredited training opportunities (Erkenningen). Among them, 33,070 professional practice formation agreements (BPVO) were concluded in the training year under review.

In addition, an interactive map traces the distribution of training companies (Leerbedrijven) and accredited training opportunities (Erkenningen) according to their density in the various regions. This enables decision-makers to identify mismatches and support appropriate mobility actions.



Source: Beroepsonderwijs & Bedrijfsleven

With these data and the data retrieval tool, longer-term trends in individual occupations can also be identified. In the example below, the data for the market segment ICT is selected. The chart shows 'information and communications technology' trainees by specialisation from 2015 to 2020. The most significant increase can be seen among software developers, whose number rose from 6,482 trainees in 2015 to 8,916 in 2020.



Source: Beroepsopleidingen & Bedrijfsleven

These interactive data prepared and provided by the SBB create transparency both for companies and political decision-makers.



4.1.4 Participation of learners

Measuring the participation of learners is more challenging than measuring that of companies, because different points of reference may be used. As work-based learning is both a type of education and a specific form of work, the learners' involvement can be viewed against the backdrop of the education system as well as in relation to the employment system. The relevance of work-based learning may be measured in terms of enrolment rates, i.e. the proportion of learners in WBL programmes out of all students (see the example in the paragraph below). Such enrolment data are useful for gaining an overall picture of the main features of an education system and the 'weight' of its different branches (Kis, 2020, pp. 27–30). The difficulty with this approach is that the position of work-based learning within the education system may vary from one country to another. For instance, while countries with dual VET systems, like Denmark or Germany, consider in-company training as part of initial VET at the level of upper-secondary education, others, notably Australia and Canada, view it as part of further education, since it typically takes place after completing upper secondary education (Ulbrich, Grollmann and Hugo, 2020, p. 5).

The alternative is to view participation in WBL as an aspect of employment. This can be done by means of the training ratio, which is the proportion of trainees or apprentices out of all employees. The numerator for this indicator is the number of employees working on the basis of a training contract or similar agreement with a company and/or training institution. The denominator would be the total number of employees (Hucker and Troltsch, 2012, pp. 40–3). The training ratio in this sense describes the relevance of in-company training (and hence, work-based learning) independently of the formal structure of the VET system. It will be particularly suitable in countries where company-based training is typically part of educational programmes or learning opportunities that are not classified as upper-secondary VET.

4.2 Financial resources, costs and benefits

In most countries, covering the **costs for work-based learning programmes** is shared by the government, employers and individuals. Typically, vocational programmes combine learning at the workplace with learning in the classroom and a distinction can be made between costs that are related to the work-based component of a programme and those related to the school-based component. A third category includes costs that are related to the management and steering of programmes and the VET system as a whole (ETF, 2018b, p. 21).

TABLE 4.3 Cost categories in work-based learning programmes

Work-based costs	School-based costs	VET system costs
• In-company trainers • Trainers' professional development • Training equipment, tools • Learning materials • Learners' wages/allowances • Learners' insurance • Learners' transport • <i>(Inter-company training centres)</i>	• Teachers' salaries • Teachers' professional development • Training equipment and tools • Maintenance • Communal services (electricity, water, etc.) • Learning materials	• Setting standards • Inspection and supervision • Assessment • Counselling and guidance • Research • Administration

Usually, employers meet most or all work-based costs. However, in some VET systems, employers also cover some of the school-based costs. Ultimately, the companies hosting trainees benefit from work-based learning. Learners do productive work that may see the host company recoup some or all of the cost of providing the training. Some company benefits may accrue only after the training programme has been completed – for instance, reduced costs for recruiting and onboarding new employees. The details are presented in the country example from Switzerland below.

Why monitor the costs and benefits of work-based learning?

It can help companies considering offering WBL opportunities understand the costs and benefits of training. They can:

- calculate their own costs and benefits based on the cost-benefit model;
- compare their own results with the average costs and benefits in a given country;
- make more detailed comparisons at the level of industry sectors or occupations;
- see how data on costs and benefits can help reduce uncertainties around offering work-based learning opportunities for students.



Data on the costs and benefits of WBL constitute crucial information for policy makers to:

- better understand the factors that influence the cost-benefit ratio for companies, e.g. the occupation and industry sector, company size, share of work-based learning in a vocational programme, training wage;
- make informed decisions when considering introducing financial or non-financial incentives for companies;
- conduct further assessment studies, such as cost-benefit analysis and other analysis;
- make international comparisons, to better understand how much WBL costs and how and why work-based learning programmes and systems work (or may not work).

Cost-benefit studies for company-based vocational education have a long tradition. They were initiated in Germany in the 1970s (Edding, 1974) and the first representative company survey was conducted in the early 1980s. After this, six surveys were carried out in Germany⁵. Important findings relate to increases and decreases in net costs over time and the comparison across occupations or large and smaller companies. In the meantime, three data sets have become publicly available⁶ and allow for differentiated statistical analyses of the various cost types and their determinants.

A decisive development was the introduction of cost-benefit studies in Switzerland in the early 2000s. There, the survey was conducted exactly based on the German model, including the questionnaire and survey design. This allowed a direct comparison to be made of in-company training costs between Germany and Switzerland, and revealed they are lower for Swiss companies. The reasons for this are the lower training allowances and a more productive use of trainees (Pfeifer et al., 2018). Similar exercises in (or across) other EU Member States or EU neighbouring countries could be a very important step forward in assessing the introduction and implementation of WBL. They would strengthen both the monitoring systems for WBL and the possibility of further and comparative analysis (assessments) in the EU and beyond.

⁵ www.bibb.de/en/698.php

⁶ www.bibb.de/de/1381.php (in German)

COUNTRY EXAMPLE Switzerland – costs and benefits for companies

Since the academic year 2000/01, four cost-benefit studies have been carried out in Switzerland, the last one in 2016/17. Data are available for two-, three- and four-year vocational programmes. The results show that the value of the productive work of an average Swiss apprentice exceeded the gross costs of their training, resulting in net benefits (CHF 3,173) for the company. However, there was considerable variation in costs and benefits, depending on the duration of the programme, occupational profile, company size and region. **Table 4.4** shows the results per learner for an average training year.

TABLE 4.4 Costs and benefits per learner for an average training year in Switzerland, 2016

Costs and benefits	CHF	%
Gross costs		
Learner's wage	13,502	48
Personnel costs - Recruitment - Administration - Training	10,856	39
Material costs - Consumables - Equipment, tools, facilities - Instruction materials - Assessment	1,866	7
Other costs	1,843	6
Total	28,067	100
Benefits derived from productive work of the learner		
Unskilled tasks	19,319	62
Skilled tasks	11,516	37
Other benefits	404	1
Total	31,239	100
Net benefit	3,173	

Source: Adapted from Gehret et al., 2019, p. 40

Methodology for the Swiss cost-benefit study

The sample for the 2017 cost-benefit study was taken from the Swiss business register. Some 20,984 training companies and 14,500 non-training companies were invited to take part in the survey. The response rates were 27.4% (or 5,712 training companies) and 28.8% (or 4,064 non-training companies). Almost all (98%) of the companies answered the survey online. **Table 4.5** shows the composition of the training company sample according to company size (other variables are industry sector, occupation, duration of programme, region).

TABLE 4.5 Composition of the training company sample by size

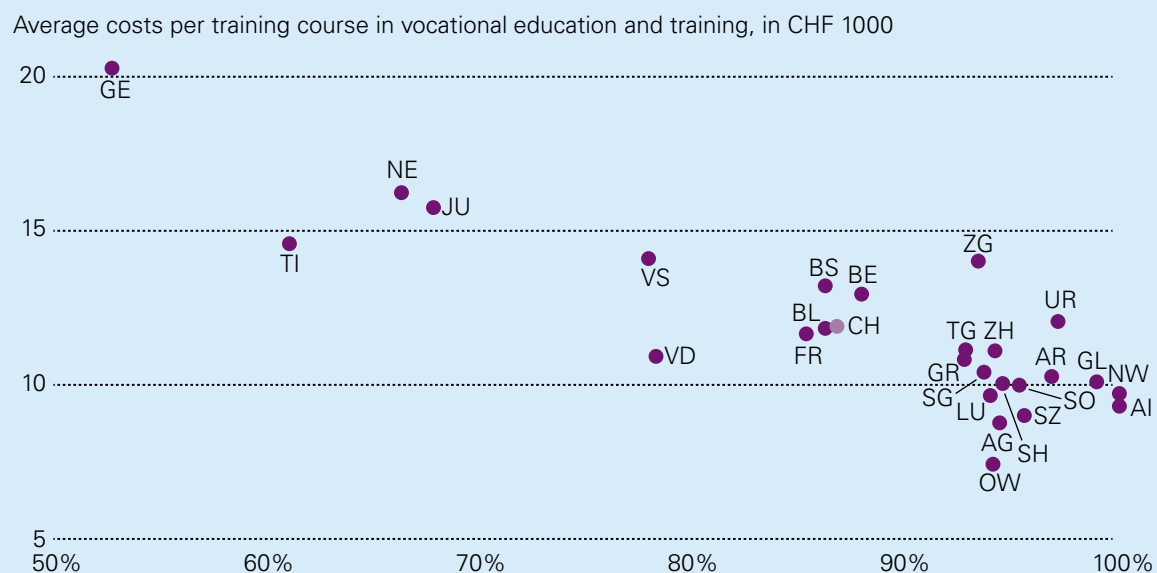
Company size	Number	%
1–9	2,104	36.83
10–49	1,939	33.95
50–99	790	13.83
>99	879	15.39

Source: Gehret et al., 2019, p. 20ff

COUNTRY EXAMPLE Switzerland – impact of WBL on public expenditure

Apprenticeship programmes with a high share of work-based learning are not equally common throughout Switzerland's 26 cantons. While in most of the cantons between 90% and 100% of the students follow company-based vocational education and training courses (with around 80% of the curriculum time spent at the company), the proportion of students enrolled in such courses is considerably lower in cantons like Geneva or Ticino, where school-based VET courses are also common. A comparative analysis of the 26 cantons shows how the dissemination of work-based vocational education and training courses reduces or increases the cost to the public purse. For example, in the canton of Nidwalden, where 100% of the courses offered are work-based, the average costs to the public purse per learner (per training course) are around CHF 10,000. In Geneva, on the other hand, a canton where company-based courses account for only around 50% of vocational education and training programmes (see **Figure 4.4**), public expenditure on an average course is significantly higher (around CHF 20,000 per learner). Almost three-quarters of the differences in cantonal spending per learner in VET can be explained by the varying proportions of school-based and company-based training places in vocational education and training courses (SCCRE, 2018, pp. 128ff.).

FIGURE 4.4 Public spending on VET per learner in relation to the share of school-based/work-based training programmes, by canton, 2016



Source: SCCRE, 2018, p. 129

The success of the Swiss apprenticeship model has, in recent years, attracted the attention of many policy makers in Europe and other parts of the world. In 2015, Wolter and Mühlemann analysed whether an average Spanish company could expect a net benefit when training apprentices in a similar way to Swiss firms.

COUNTRY EXAMPLE Spain – simulation of costs and benefits

The analysis was conducted for 10 different occupations from six different economic sectors, simulating the costs and benefits of apprenticeship training by using relevant parameters of comparable training programmes in Swiss firms (e.g. the productivity of apprentices) and Spanish labour-market data (e.g. the wages of skilled and unskilled workers, and apprentices' wages). In Spain, two different wage scenarios were used: one in which apprentices receive EUR 300 per month and another where the apprentices earn EUR 530 per month. The two wage scenarios were applied to three different models. Model 1, for instance, was based on the assumption that apprentices spend 1,600 hours in class and 600 hours on formal in-firm training, in addition to the time spent working. The simulation showed that the benefits may outweigh the costs in Spanish companies also. However, the results varied greatly, depending on the model, occupation and apprentice wage.

More generally, Wolter (2019, p. 34ff.) points out that cost-benefit simulations can help identify opportunities for and barriers to the expansion or introduction of apprenticeship training and that *ex-ante* simulations can be used as a benchmark for *ex-post* evaluations. According to Wolter, cost-benefit simulations are also particularly useful for the following reasons:

- The heterogeneity of models currently in use in a country may be too large to be generalised (external validity).
- The companies engaged in training today may not be representative of the ones that policy makers would like to attract into apprenticeship training in the future (external validity).
- The database that can be extracted from training companies may be too limited to draw conclusions (internal validity).
- The current training models may not be the ones that promise success in the future (external validity).

4.3 Design of training programmes and curricula

Curriculum design is one of the qualitative factors that influence the outcomes of work-based learning. The relevance of the curriculum has a substantial or material (content-related) as well as methodological or procedural (process-related) dimension. The substantial dimension relates to what should be learned. Usually, a curriculum takes the form of a detailed description of the learning objectives, together with an indicative timeline that specifies the sequence in which the contents should be imparted. In recent years, rather than describing content or organising it around catalogues of knowledge, learning outcomes have become a major principle directing how curricula are organised. In some contexts, they also align with an occupational profile; in others, they represent the skills and competence that can be used in a number of workplaces.

One example of how to organise the content of work-based learning is the training ordinances in the German dual system. These enumerate the skills that are characteristic of a specific occupation and set out a generic training plan, which outlines the potential



chronological order of content delivery. Further specifications regarding methods are not provided, but the training naturally relates to the company as a work-based learning environment. In addition, in-company training regulations are complemented by school curricula for the respective occupation.

One of many alternative approaches is to limit the curriculum document strictly to the definition of learning objectives and leave the details of the training programme to the discretion of training providers, in which case the curriculum would be transformed into a set of occupational or educational standards. An example of this approach is the concept of 'Training Packages' in Australia. Training Packages are occupation-specific 'sets of competency standards', which describe the knowledge and skills required for a given occupation, but do not prescribe any particular method for attaining them. In practice, these documents serve as guidelines for training programmes delivered by Technical and Further Education (TAFE) institutes, as well as for cooperative programmes under the Australian Apprenticeship scheme (Deißinger et al., 2017).

The procedural dimension relates to the way the content is taught. In this regard, the curriculum needs to include basic guidelines for organising the learning process, in terms of teaching and learning methods, and the (approximate) amount of time to be spent at the different learning venues. However, the exact numbers of learning hours and, hence, the share of work-based learning in the total training time will likely depend on how the curriculum is implemented at shop-floor level (see also Section 5.2). At the same time, it must be considered that the share of work-based learning is often limited by default when WBL is part of a school-based programme. In the absence of part-time vocational schools (as opposed to full-time schools) that supplement the company-based part of the training programme and do not issue qualifications on their own, the full-time vocational school will always be the dominant learning venue and account for the larger share of the training time. Consequently, it should not be assumed that only training programmes in which the WBL component comprises 50% or more of the VET curriculum are high quality.

Given that evaluating the success of a training programme also depends on ascertaining whether and to what extent the desired learning outcomes have been achieved, the curriculum needs to specify criteria for the assessment of learners.

As argued in Chapter 2, this expectation that the contents of a curriculum should respond to specific requirements in the world of work is the reason why feedback from the employment system is essential. Therefore, it is highly recommended that labour-market players (employers as well as trade unions) be involved in the process of curriculum design or the definition of occupational/qualification standards. Given that labour-market requirements are not static, there is also a need to review and revise the curricula from time to time. Such revisions may take place periodically, i.e. at regular intervals, or on a case-by-case basis. The information used to develop and revise curricula may come from a variety of sources. On the one hand, policy makers and stakeholders may draw on reviews and evaluation studies designed with the specific programme or curriculum in mind. On the other, the continuous flow of labour-market data may be used to assess the outcomes of training programmes in order to detect the need for changes. These approaches are by no means mutually exclusive and may complement each other.



As the above-mentioned feedback is predominantly qualitative it also needs to be analysed in terms of qualitative criteria, e.g. by checking whether features such as specification of learning outcomes, representation and involvement of social partners in programme design and revision, procedures for adjusting the learning outcomes to labour-market needs, etc. are in place or not. A possible quantitative indicator of the effectiveness of feedback is the frequency of revisions or updates of VET curricula.

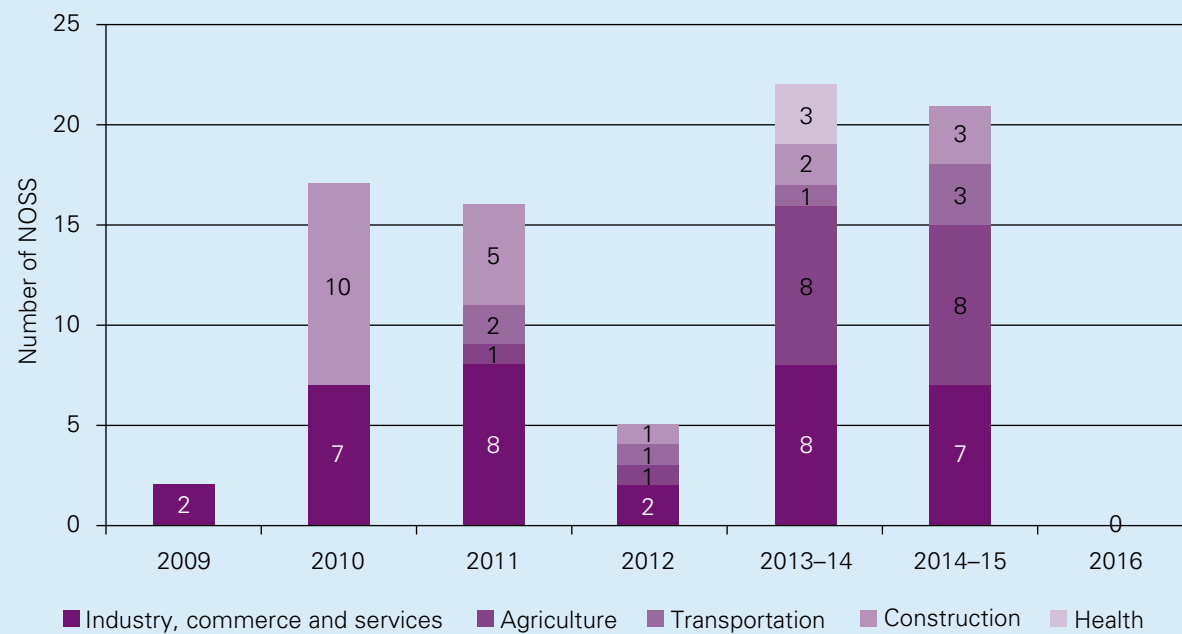
COUNTRY EXAMPLE Australia – review of training packages

‘Training Packages’ in Australia are subject to periodic reviews that take place every three years, on average. The objective of the review process is to check the quality and continuing relevance of the training package in question. At the first stage of the process, experts from public and private institutions carry out studies on the implementation of the training packages and draw up recommendations. At the second stage, the training packages are revised and updated as necessary by the Industry Skills Council in charge and approved by the National Quality Council. Instead of an update, the review may also lead to the development of entirely new training packages by the competent institutions (Deißinger et al., 2017, p. 66).

COUNTRY EXAMPLE Vietnam – skill standards

Annual reporting on curricular and regulatory innovation is an essential part of Vietnamese TVET (technical and vocational education and training) research. **Figure 4.5** provides an overview of the progress of the development of assessment formats.

FIGURE 4.5 Number of national occupational skills' examination by sector, 2009–16



Note: NOSS – national occupational skills standards.

Source: NIVET, 2018



COUNTRY EXAMPLE Portugal – National Catalogue of Qualifications

Since 2007, further to the adoption of the Decree-Law in Portugal that established the National System of Qualifications and its related tools, significant efforts have been made to develop a fully-fledged process for designing, reviewing and approving new qualification standards, which are the main reference for all the country's vocational education programmes and curricula.

With the creation, in 2008, of the National Catalogue of Qualifications⁷, a set of procedures was also established to allow the continuous updating of the qualification standards through the work of 18 Sectoral Skills Councils, under the supervision and guidance of the National Agency for Qualification and Vocational Education (ANQEP). The Councils are composed of representatives of the Ministries of Education, Labour, the Economy and other sectoral ministries, plus social-partner representatives, VET providers, experts on the specific sector and, when needed, other experts, who can be invited to the working meetings or to provide particular inputs. The Councils meet regularly – twice per year, as standard, or at the request of the ANQEP or at their own request – and are responsible for identifying needs for new qualification standards, revising existing ones and proposing the removal of outdated qualifications or specific modules. They can also ask for specific sector-skills analyses or other types of reviews and studies related to the needs of each sector.

Each quarter, ANQEP informs the National Labour Council how many standards have been removed, reviewed or introduced; who has to approve the necessary changes to be made to the National Catalogue of Qualifications, and, as a result, the necessary changes to the VET programmes and curricula that are implemented by public and private providers. This information is made available publicly, in the form of a bulletin, which is the official communication tool of National Labour Council meetings. The National Catalogue of Qualifications website contains all the information about existing qualifications, including all the revisions/changes/introductions made to each qualification.

Systematic monitoring information is then produced by the ANQEP and disseminated publicly to the providers, supervisory bodies and the general public.

⁷ <https://catalogo.anqep.gov.pt/>

Labour market information and projection systems – the future of curriculum development?

An advanced way of generating feedback with a view to updating training curricula would be to use Labour Market Information Systems (LMIS) and skills forecast methodologies. Currently, systematic linkage between such projection systems and curriculum development is rare, but there are several LMIS and skills forecasting schemes that are capable of predicting labour-market trends. These instruments have some potential to improve how curricula are adapted to the needs of the labour market, provided that they can be connected to the procedures for developing and updating curricula⁸.

⁸ An example from Austria is provided by Lassnigg and Vogtenhuber (2011).



There is no commonly accepted definition of labour-market information, but it is typically used as an umbrella term for data and information on the state of the employment system, especially on vacancies and jobseekers. LMI in this sense is used to support operational activities related to the labour market, e.g. the provision of guidance and counselling for jobseekers, and to support decision-making. Sources of labour-market information are typically administrative data (e.g. those collected by employment agencies and other public bodies), but may also include statistical or survey data. In recent years, the concept of LMI has evolved further into the notion of labour-market (and skills) *intelligence*. While the term is frequently used interchangeably with labour-market information, labour-market intelligence emphasises the additional aspect of processing the data for analytical purposes, e.g. to identify development trends and anticipate future skills needs (ETF, 2019b, pp. 8–11). Labour-market and skills intelligence is an important source of information for the formulation of VET policy and the design of VET programmes, as acknowledged in the Osnabrück Declaration, which defines skills intelligence as ‘the outcome of an expert-driven process selecting, combining and presenting evidence – based on skills forecasts, graduate tracking, skills surveys, big data analysis and other methods – to map and anticipate skill trends’ (Osnabrück Declaration, p. 4). Furthermore, it recommends that such systems be developed at the national and regional levels, and suggests that this will also ‘enable social partners, decision-makers, stakeholders and providers to adapt and update VET programmes, curricula and guidelines in a timely and effective manner’ (ibid., p. 6).

Survey data on new occupations and changing skill requirements are collected by several institutions (ETF, 2019f, p. 17). The schemes include the O*NET system operated by the US Bureau of Labour, the Pan-European Forecasting Model developed by Cedefop, the European Commission’s European Skills Panorama and the Canadian Occupational Projection System operated by Human Resource Development Canada, to name but a few. Data collection and analysis build on a variety of methods, such as standardised surveys, qualitative methods, focus groups and scenario techniques (ibid.). More recently, the potential of automated analysis of large amounts of data (‘Big Data’) has been explored with a view to labour-market intelligence and skills anticipation. Analysis of online job postings, curriculum documents and survey data may be used not only to increase the transparency of the labour market but also to identify future skills needs and model new occupations or occupational areas (ETF, 2019b). Feeding the outputs of such large-scale analyses into the process of curriculum development would provide a systematic and reliable knowledge base and dramatically enhance the efficiency of the process. The classification of European Skills, Competences, Qualifications and Occupations (ESCO) also aims to support the statistical analysis of labour-market sources such as job openings, with a view to identifying skills needs and development trends (European Commission, 2019, pp. 52–3; and 2020). In addition, ESCO aims to facilitate the identification of skill mismatches, which may indicate difficulties on the part of existing training programmes to deliver the appropriate skills.

COUNTRY EXAMPLE Portugal – SANQ, the national system for anticipation of skills needs

Portugal has developed a comprehensive and nationwide system for anticipating skills needs – the SANQ (Sistema de Antecipação de Necessidades de Qualificação), the results from which are used for adjusting education and training provision at both sectoral and regional levels.

The SANQ is used to analyse the skills needs and identify priority education and training areas and respective job-market prospects. It is also used as guidance for planning VET provision and adapting education and training offers to regional and sectoral labour-market needs. The system is updated every three years and takes into consideration economic and labour-market dynamics, with results being exploited and disseminated at regional level (NUT II). It uses a complex set of data from the existing Labour Market Information Systems (job vacancies, employment/unemployment dynamics, economic trends, etc.), combined with data on students, education and training provision.

Such data analysis is used to prioritise qualifications (NQF levels 2, 4 and 5)/education and training areas by region, and highlight those that are to be improved, removed or kept at the level of regional VET provision. It also provides basic information for updating the National Catalogue of Qualifications (see example above).

The results are discussed with the local and regional stakeholders responsible for education and training provision, including the regional education and labour authorities, municipalities and VET providers, under the coordination of the Intermunicipal Communities.

Tables showing the main results at regional level can be consulted here: <https://anqep.gov.pt/hp4/302.html>

4.4 Quality of training staff

The success of work-based learning depends on the skills and qualifications of VET teachers and trainers. This concerns the initial qualification as well as their continuing professional development. Training practitioners need to possess the relevant occupational as well as pedagogical knowledge and skills, and these need to be updated when necessary. While the requirements for school-based education, i.e. teachers, are regularly and rather strictly defined by the respective authorities, which have a good overview of the statistics, there are some particularities when it comes to work-based learning.

Generally speaking, and as in the general education system, how the regulations regarding VET teacher and trainer qualification are being supervised and enforced needs to be checked in workbased learning, as does whether continuing education for teachers and



trainers is mandatory and, if so, at what intervals. With regard to training providers and enterprises it might also be examined whether the organisations are subject to accreditation procedures and whether the skills of the teaching staff play any role in these.

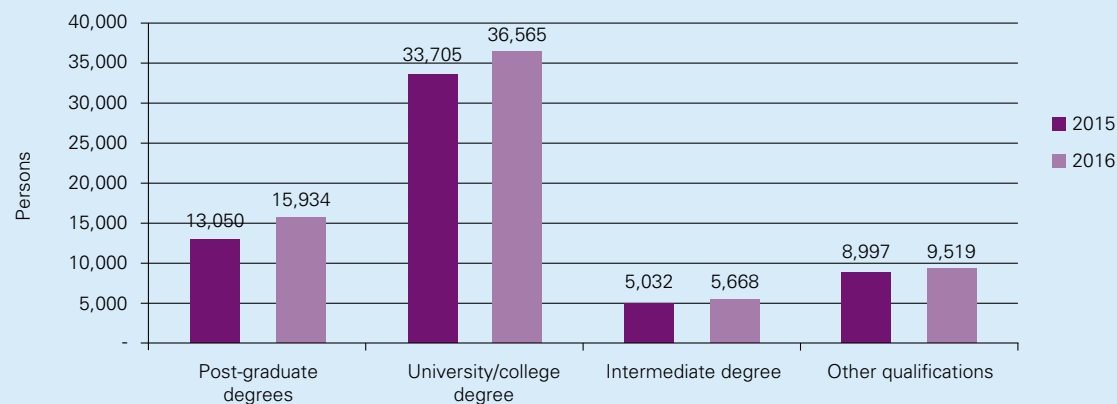
Typically, in terms of increasing the relevance to the world of work of school-based vocational education, indicators that can be used in terms of the staff involved are industry experience, so-called alternative vocational-teacher recruitment patterns or occupation-related training. With regard to alternative recruitment patterns – e.g. recruiting teachers directly from industry-, however, it might also be worthwhile to balance these with the general goal of a high professional status of vocational teachers (e.g. measured through the formal level of their degrees).

Hard evidence regarding the quality of in-company trainers is surprisingly scarce. This is because many of those who take over supervisory functions in the learning process are not necessarily seen as trainers but as skilled colleagues or superiors, and they are not assigned any formal or legal status in VET. In particular, when official bodies collect data from companies, a certain degree of data minimisation is essential in order to counter accusations of unnecessary bureaucracy. This might be the reason why, even in countries with highly standardised and established work-based learning systems, such as Australia or Germany, there is no or only minimal regular collection of data on in-company training staff (Knight, White and Granfield, 2020). The German Vocational Training Act requires that the gender, year of birth and type of professional aptitude (qualification) of the person(s) responsible for training in a company be recorded.

COUNTRY EXAMPLE Vietnam – teachers' qualifications in TVET

A regular overview of the qualifications of VET teachers is provided in the Vietnamese annual training report, broken down into several dimensions, one of which is the qualifications of teachers in TVET.

FIGURE 4.6 Professional qualifications of TVET teachers, 2015–16



Source: NIVET, 2018

It also includes regular data on industry expertise and placements of VET teachers.

BOX 4.1 Duration of TVET staff internship at enterprise

The surveys conducted in 2017 by NIVET at 88 TVET institutes and by VCCI and NIVET at 79 enterprises show that:

- Out of 88 TVET institutes, the number of institutes that sent their staff to enterprises for internship accounted for 71.59% (63 TVET institutes); the number of TVET institutes which did not send their staff to enterprises for internship accounted for 28.4% (25 TVET institutes). There were three different internship lengths in enterprises: less than 10 days (31.43%), between 10 and 30 days (40%) and over 30 days (28.57%).
- Out of 79 enterprises, 29 (36.7%) said they were ready and 50 (63.29%) said they were not ready to receive TVET teachers for internship, 9 enterprises sent their staff to TVET institutes to deliver training. Twenty enterprise staff in total were sent by their enterprises to TVET institutes to deliver training courses which were shorter than 10 days.

Source: NIVET, 2018



5. Implementing work-based learning (process)

5.1 Organisation of the learning process

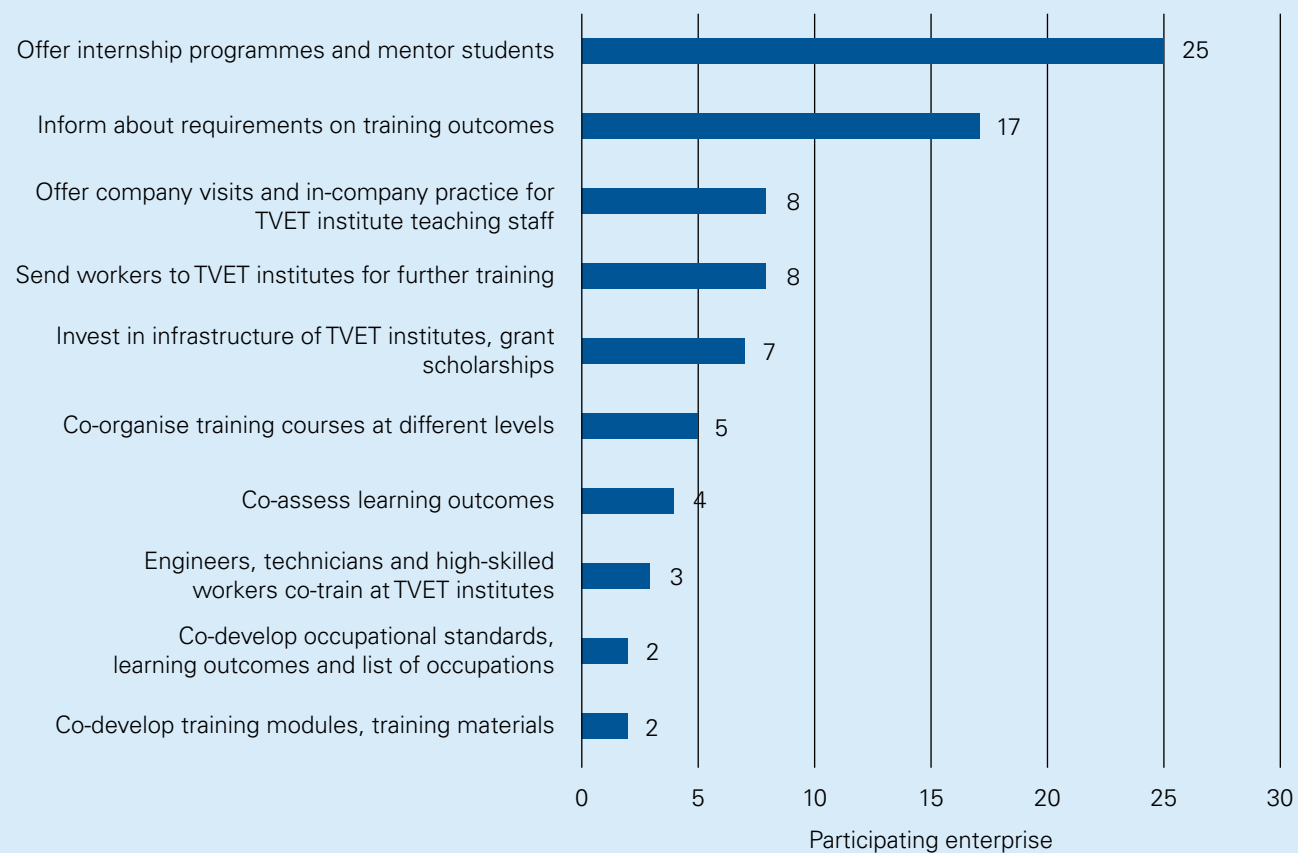
The learning process needs to be implemented, at each learning venue, in accordance with the curriculum and other resources available. In the first instance, an adequate proportion of the training time must be spent in the workplace and the tasks assigned to the learners must be conducive to successful learning and in accordance with the curriculum. Furthermore, the activities at the different learning venues need to be consistent and complementary. To this end, measures should be taken to facilitate cooperation between the learning venues, while the learning process as a whole, including the learning environment and the resources/materials available, needs to be supervised. This could be achieved by local training committees comprising representatives of the employers and the schools. In addition, training companies should be visited on a regular basis by teachers and/or representatives of the supervising bodies.

The share of WBL in the total training time (Kis, 2020, ch. 4) is a simple descriptor that helps characterise the learning process and estimate its compliance with the curriculum. Regarding cooperation of learning venues, as mentioned above, the existence of regulations and organisational arrangements should be confirmed and the extent to which they are enforced checked. The frequency of bilateral meetings between companies and schools could be an indicator of the cooperation of learning venues.

COUNTRY EXAMPLE Vietnam – cooperation of learning venues

Cooperation between companies and VET providers plays an important role with regard to several dimensions of quality VET. Within the Vietnamese reporting system an enterprise survey is conducted on a regular basis that provides information on different forms of and reasons for cooperation.

FIGURE 5.1 Forms of cooperation between enterprises and TVET institutes



Source: NIVET, 2018

5.2 Potential and use of digital technologies to support teaching/instruction and learning

Digital technologies can help create meaningful learning experiences for learners, teachers and trainers, but can also be a challenging element in the organisation of the learning process. Digital learning can happen across all curriculum learning areas, including the workplace. Digital learning environments can make education and training more accessible, in and outside of education and training settings, whether in schools, companies or at home.

The European Commission supports the effective digitalisation of VET provision in both school-based and work-based learning environments through promoting the use of European competence frameworks⁹ and SELFIE¹⁰. The latter is a free self-assessment tool that supports VET institutions in using digital technologies for teaching and learning effectively and in enhancing their cooperation with employers in work-based learning schemes. SELFIE has a strong basis in research and anonymously gathers the views of learners, teachers, school leaders and company trainers on how technology is used in their school or company. This is done using short statements and questions, and a simple 1–5 answer scale. Based on this input, the tool generates a report – a snapshot, or ‘SELFIE’, of a school’s (and the companies cooperating with it) strengths and weaknesses in their use of technology. The SELFIE tool is available in more than 30 languages for use in any vocational school in Europe and beyond.

The questionnaire for the self-assessment covers eight sections.

1. **Leadership**: this section looks at the role of leadership in the school-wide integration of digital technologies and their effective use for the school’s core work: teaching and learning.
2. **Collaboration and networking**: this section relates to measures that schools and companies may consider taking to support a culture of collaboration and communication for sharing experiences and learning effectively within and beyond organisational boundaries.
3. **Infrastructure and equipment**: this area is about having suitable, reliable and secure infrastructure (such as equipment, software, information resources, internet connection, technical support or physical space) in schools and enterprises. This can enable and facilitate innovative teaching, learning and assessment practices.
4. **Continuing professional development**: this section looks at whether or not the school and company facilitate and invest in the continuing professional development (CPD) of staff at all levels. CPD can support the development and integration of new modes of teaching and learning that harness digital technologies to achieve better learning outcomes.
5. **Pedagogy (support and resources)**: this section relates to preparations for using digital technologies for learning by updating and developing new teaching and learning practices.
6. **Pedagogy (implementation in the classroom/workshop)**: this section relates to using digital technologies for learning in the classroom and at the workplace, by updating and developing new teaching and learning practices.

⁹ The Digital Competence Framework for Citizens (DigComp), the Digital Competence Framework for Educators (DigCompEdu), and the Digital Competence Framework for Organisations (DigCompO).

¹⁰ Self-reflection on effective learning by fostering the use of innovative educational technologies [tool].

7. **Assessment practices:** this section relates to measures that schools and companies may consider taking to gradually shift the balance from traditional assessment towards a more comprehensive repertoire of practices. This repertoire could include technology-enabled assessment practices that are student-centred, personalised and authentic.
8. **Student digital competence:** this section is about the set of skills, knowledge and attitudes that enable confident, creative and critical use of digital technologies by students.

Example of an item from the first section: leadership

Item code	Item title	School leader	Teacher	Student	In-company trainer
A6	Involving companies in strategy	In our school, companies we collaborate with are involved in the development of the school's digital strategy	In our school, companies we collaborate with are involved in the development of the school's digital strategy		As a company, we are involved in the development of the school's digital strategy

SELFIE is a simple and efficient tool for collecting qualitative information from different players. In some cases, it may be advisable to supplement this information with other indicators – for instance, learners' access to equipment and software.

5.3 Assessment of learners

Figures on final examinations taken in different occupations or according to other criteria, such as gender or region, also provide information on the characteristics of the WBL process. Hence, monitoring final examinations is a standard task for observing the performance of a system.

In recent years, however, new models of assessing the practical skills of apprentices and students have been developed and introduced in countries with a more school-based system. Here, it is important to stress that, besides the summative effects of the examinations, the more formative aspects are also evaluated. In Finland, practical examinations – the so-called skill demonstrations – were also used to bring schools and companies, as well as teachers and trainers, closer together and to promote cooperation between learning sites (Räsänen, Räikköläinen, 2014). Often – whether in work-based or school-based systems – examinations juries and commissions set up for this purpose play an important role in communication between companies and the education system. In that sense, the continuous application of work-based assessment models can also improve the learning process, and the existence of such mechanisms can be seen as an indicator of the quality of the learning process.

COUNTRY EXAMPLE Switzerland – vocational examinations

Using Switzerland as an example, we compiled corresponding information for initial vocational examinations and higher vocational qualifications that can be acquired after an initial vocational programme. A frequently used indicator is the percentage of completed examinations as a proportion of all examinations conducted, as can be seen in **Table 5.1**. It is clear, for example, that the proportion of examinations not completed is higher in construction than in IT occupations. This could be due to the exams themselves, as much as to the learners or schools and companies. In the first instance, however, these figures provide an opportunity to identify where in the system more attention may be needed.

TABLE 5.1 Examinations and completed qualifications in selected programmes (two-year apprenticeships, Federal Certificate of Vocational Education and Training) according to the ISCED field of training, 2019

	Number of examinations	Completed	Share of completed examinations (%)
Total	7,252	6,707	92
Audio-visual techniques and media production	31	31	100
Arts and crafts	12	9	75
Secretarial and office work	443	421	95
Wholesale and retail	1,756	1,611	92
Databases, network design and administration	72	70	97
Electricity and energy	7	5	71
Mechanical engineering and metal processing	454	431	95
Motor vehicles, ships and aircraft	481	431	90
Food	176	171	97
Materials (glass, paper, plastic and wood)	372	364	98
Textiles (clothing, footwear and leather)	40	39	98

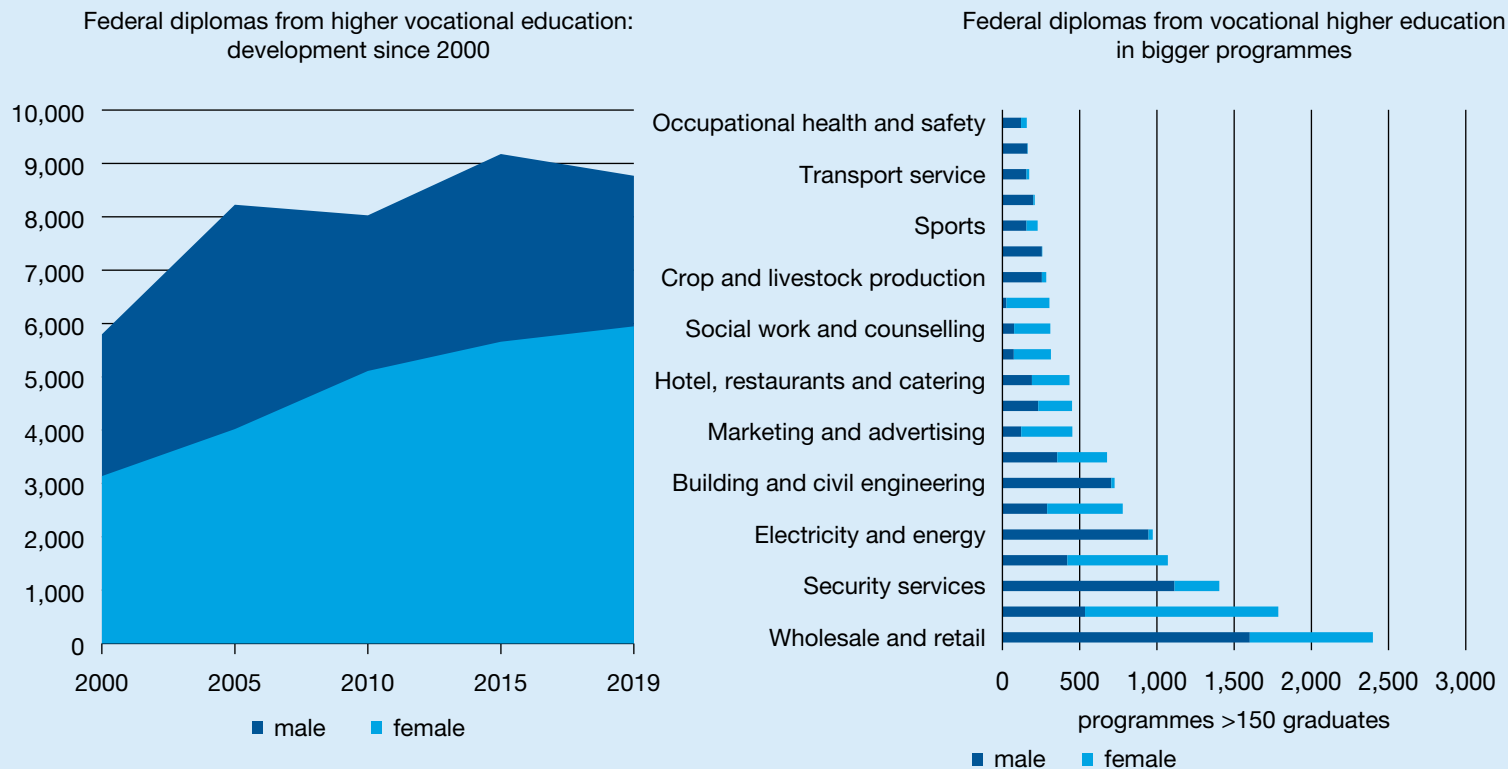


	Number of examinations	Completed	Share of completed examinations (%)
Construction, building and civil engineering	760	643	85
Crop production and animal husbandry	178	170	96
Horticulture	234	213	91
Forestry	6	5	83
Interdisciplinary programmes and qualifications with health and social services	1,091	1,073	98
Domestic services	487	426	87
Hairdressing and beauty care	140	135	96
Hospitality and catering	494	442	89
Transport services	18	17	94

Source: Bundesamt für Statistik, 2020d

Time series can also be informative: from the information from the years 2000–19 in **Figure 5.2**, for example, it is possible to see the increase in the proportion of female graduates as well as the general increase in final examinations in higher vocational education.

FIGURE 5.2 Federal diplomas according to gender and fields of education and training



Source: Bundesamt für Statistik, 2020a; b; e. Charts: BIBB

In the graphic on the right, the same figures are presented according to different fields of vocational education, so that the occupational fields in which there is particularly strong gender differentiation become clear. The underrepresentation of female graduates in the so-called STEM (science, technology, engineering, mathematics) subjects also stands out.



6. Delivering work-based learning (output)

6.1 Learning achievements

The immediate success of work-based learning consists of meeting the learning objectives specified in the relevant curriculum. A programme can be considered successful, therefore, if the learning achievements of participants match these objectives. Given the importance of learning objectives as a measure of learning achievement, it is astonishing that there is often a lack of good information available on different aspects of assessments and examinations.

The achievement of curricular goals is continuously monitored in everyday life via learning and performance assessments, success or failure in examinations and – particularly with regard to the work-based learning process – competent or incompetent performance on the job.

Data from all these sources could ultimately be used to continuously monitor the performance of educational programmes, individual institutions and the system. However, this also entails a number of problems and challenges, an exhaustive discussion of which is beyond the scope of this handbook. They can be summed up as the classic challenges inherent in the use of assessment instruments: objectivity, validity and reliability.

- **Objectivity:** the results of examinations and everyday assessments don't always fulfil this criterion, which is why, in many cases, additional test procedures were introduced in order to evaluate learning achievements from an external perspective.
- **Validity:** this is a core challenge in work-based learning, where the most 'valid' method might be the continuous assessment of learners' performance on the job, but this gives rise to problems with objectivity and reliability.
- **Reliability:** this is continuously challenged by economic changes and technological advancements that might render test formats out of date.

In addition, there are pedagogical issues and those related to the informational self-determination of the learners.

These are only some of the reasons why measures of learning achievement are not yet seen as significant in terms of outcome monitoring as one might initially expect.



Nevertheless, there have been some developments in recent years, not least prompted by the discussions around the introduction of large-scale assessment in VET (Achtenhagen and Baethge, 2007; Rauner et al., 2011; Schütte and Spöttl, 2011). The role models for these are such well-developed large-scale test formats in education and learning as PISA or PIAAC, even if these have only limited suitability for evaluating the results of vocational education and training, and WBL in particular.

While taking the completion of a WBL programme as a measure of its effectiveness (and the aggregated completion rates as a measure of the performance of the VET system as a whole) is a simple and straightforward idea, it is important to be clear on the meaning of the term 'completion'. Specifically, completion rates need to be distinguished from graduation rates (Kis, 2020, p. 31). The graduation rate can be defined as the percentage of an age cohort acquiring a degree or formal qualification at a specific educational level (e.g. upper secondary education). Completion rates, by contrast, refer to the percentage of entrants into a specific educational level or educational track who graduate within this track after the usual period of study or training (ibid.). This distinction is important, since it is not possible to make inferences from graduation rates regarding the performance of the education system or individual education and training programmes. This is because graduation can also be the result of a recognition and validation of prior learning.

The completion rate is an appropriate indicator of the success of the learners in a given programme in terms of achieving the overall objective of that programme. The higher the proportion of learners who successfully complete the training programme, the more effective the training programme in question. Retention of learners can also be viewed as a sign of satisfaction with their training. By contrast, termination of a training programme is more difficult to interpret, as it does not necessarily indicate a failure or lack of effectiveness of the programme. While some learners who terminate their training programmes before completion do indeed drop out of vocational education – in the sense that they do not continue their training and do not acquire any vocational qualification – others merely change the direction of their learning pathway. They continue to pursue the objective of achieving a qualification or degree, but switch to another training programme or to a different training enterprise. In this case, early termination of a training programme is an act of 'stopping out' rather than 'dropping out' (see below), signifying an attempt by the learner to reassess and improve their educational pathway. Empirical evidence shows that the earlier VET students come to the decision to terminate their current training, the more likely they are to 'stop out' and embark on another training programme, ultimately acquiring a qualification (Wydra-Somaggio, 2021). Early leaving is not necessarily a negative phenomenon, therefore. Everything else being equal, however, preventing early leaving contributes to the overall efficiency of the VET system, as the resources already invested by all parties in the training contract are used according to their purpose (Ebbinghaus et al., 2012).

6.2 Dropping out from work-based learning

Leaving education and training early¹¹ is a serious issue in many EU Member States and neighbouring countries. Those who leave education and training early face considerable difficulties in the labour market, as well as limited personal and social opportunities in the long term. For example, they may find it hard to gain a secure foothold in the job market, as employers may be reluctant to hire people with low levels of education and training.

To better understand why young people drop out from education and training programmes, close monitoring of the education and training system is essential. Data will also help in designing the mix of preventative measures and those that focus on the reintegration of dropouts.

Monitoring and evaluation should help answer the following questions¹²:

- Who is leaving the system?
- When are learners leaving the system and do they re-enter it?
- Why are learners leaving the system?

Not all early leavers are dropouts. In many countries, a substantial number of early leavers are non-starters – young people who achieved a lower secondary level of education (or lower) and never began an education or training programme at the next level. Similarly, not all dropouts are early leavers according to the EU definition. For instance, a young person may drop out of an education and training programme and immediately start another programme (see above). Furthermore, dropouts aged over 24 are not included in the EU statistics on early leaving from education and training.

While calculating dropout rates for school-based vocational programmes is usually not a major problem, things can become more challenging when looking at apprenticeship programmes or – more generally – vocational programmes with a substantial work-based learning component. This applies, in particular, to cases where the participation in the education or training programme is linked to a contract with a training company. In some of these cases, it was decided to use contract termination rates as a way of monitoring the rate of dropping out from work-based learning. However, the termination of an apprenticeship contract (or agreement) with one company does not necessarily mean that the learner is leaving the apprenticeship system. They might continue the programme with another company. It is therefore essential to monitor, using individual learners' tracking systems, contract termination over a longer period of time and to find out if and when learners re-enter or restart the same or another programme. This is the approach followed in Switzerland, a country with a classic apprenticeship system. However, the basic principles of this approach may also be applied in systems where programme participation is not directly linked to a contract with an employer. In such cases, where learners still have the status of a student – even when a substantial share of learning is spent at the workplace – the agreements between learners and employers need to be looked at.

¹¹ Leaving education and training early is defined by the EU as the percentage of the population aged 18–24 with, at most, lower secondary education who were not in further education or training during the four weeks preceding the survey. The EU benchmark is that the share of early leavers from education and training should not be more than 10%.

¹² More information on solutions to early leaving and related evaluation concepts can be found in Cedefop (2016).

COUNTRY EXAMPLE Switzerland – apprenticeship contract termination

Dual apprenticeship programmes in Switzerland are offered in three different forms: four-year programmes, three-year programmes (Federal Diploma of Vocational Education and Training) and two-year programmes (Federal Certificate of Vocational Education and Training). Longitudinal analyses are available for all three types of programme. The analysis looks at a cohort of apprentices who started their dual apprenticeship programme at a certain point in time and tracks their behaviours over a four-and-a-half-year period (regarding the contract termination rate and the re-entry rate) and a five-and-a-half-year period (regarding the certification rate). **Table 6.1** shows the contract termination data for learners who started their three-year apprenticeship programme between 30 June and 31 October 2015. The learners were tracked for four-and-a-half years until 31 December 2019.

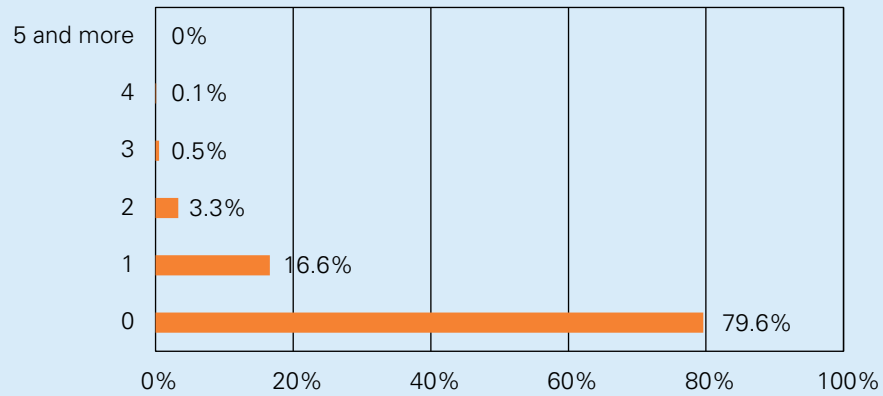
TABLE 6.1 Starters and contract termination in a three-year apprenticeship in Switzerland, 2015 cohort

Starters	Contract terminations	Termination rate (contract-related)	Learners with at least one contract termination	Termination rate (person-related)
36,184	9,011	24.9%	7,386	20.4%

Source: Bundesamt für Statistik, 2020c

Schmid (2016) highlights the advantages of the longitudinal approach: termination rates can be calculated precisely for each cohort and a distinction can be made between a contract-related termination rate, which looks at the number and share of terminated contracts, and a person-related rate, which looks at individual learners. Since some learners experience several apprenticeship contract terminations, the number of people affected is usually lower than the number of terminated contracts. **Figure 6.1** shows that 16.6% of the learners who started a three-year apprenticeship in 2015 experienced one contract termination and 3.3% experienced two contract terminations. More than two contract terminations were extremely rare.

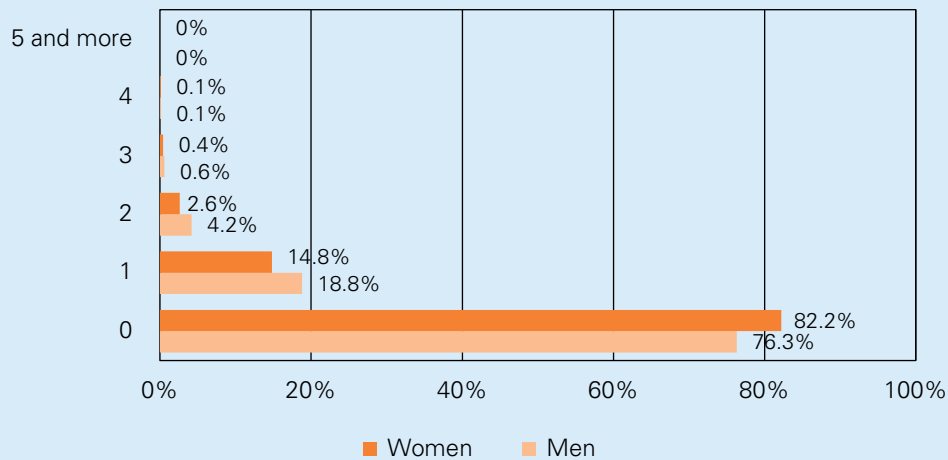
FIGURE 6.1 Share of contract terminations in a three-year apprenticeship in Switzerland, 2015 cohort



Source: Bundesamt für Statistik, 2020c. Chart: ETF

Men were more affected by contract terminations than women.

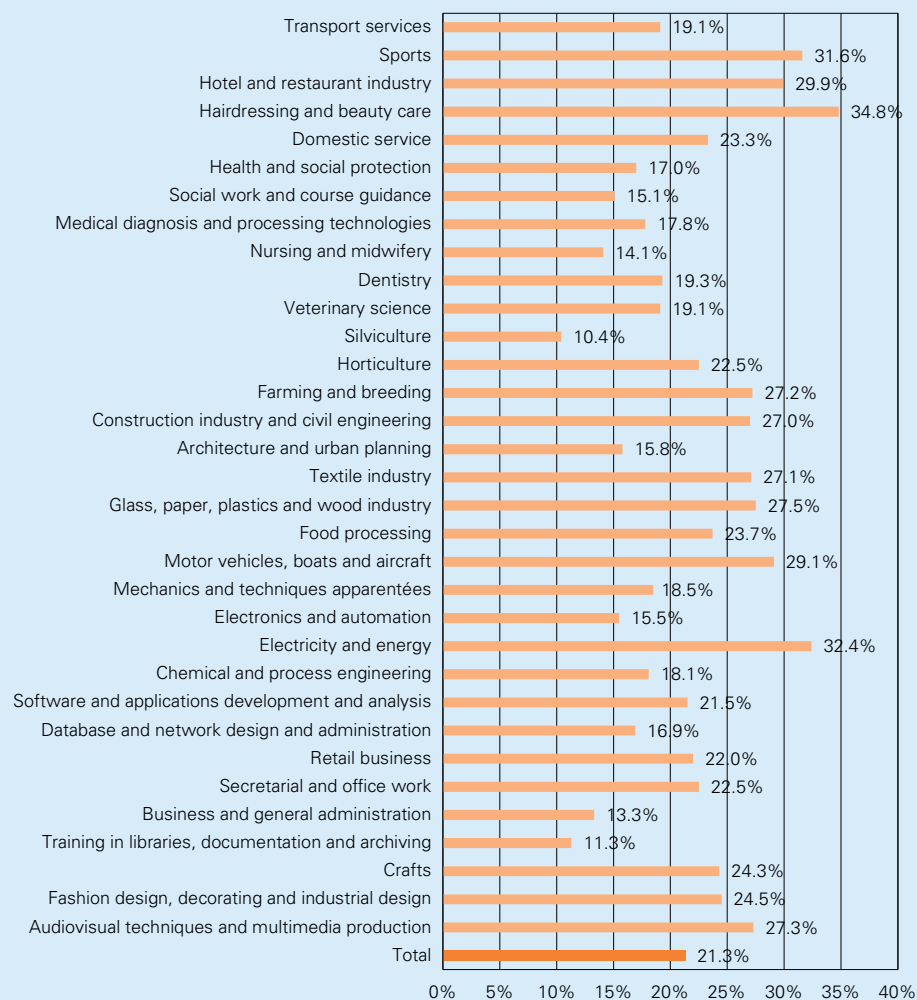
FIGURE 6.2 Share of contract terminations in a three-year apprenticeship in Switzerland by gender, 2015 cohort



Source: Bundesamt für Statistik, 2020c. Chart: ETF

Contract termination rates vary greatly between occupational fields. **Figure 6.3** shows aggregated data for all three programme types (two-year, three-year and four-year apprenticeships). Particularly high dropout rates can be observed in the occupational fields of hairdressing and beauty care (34.8%), as well as electricity and energy (32.4%).

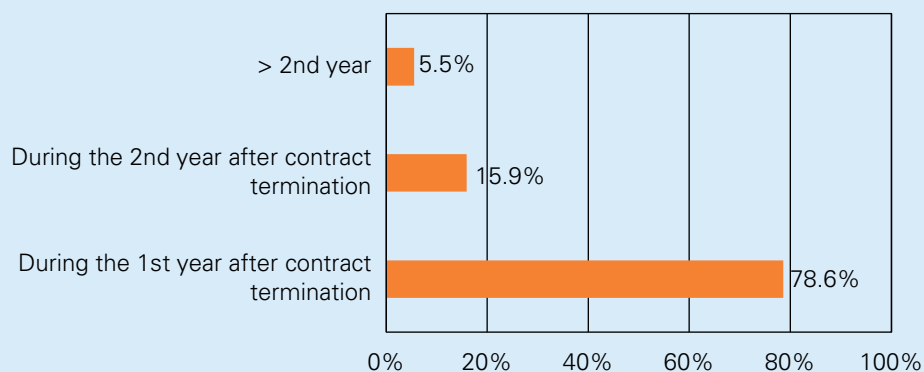
FIGURE 6.3 Apprenticeship contract termination rate by occupational field – two-, three- and four-year apprenticeships in Switzerland, 2015 cohort



Source: Bundesamt für Statistik, 2020c. Chart: ETF

Of the 7,386 learners who had terminated a contract since 2015, 5,898 or 79.9% re-entered the system. The vast majority (78.6%) of those who re-started did so during the first year after contract termination; 15.9% of the learners started again during the second year after contract termination; and 5.5% took more than two years to start again.

FIGURE 6.4 Duration of interruption until re-entry – three-year apprenticeship in Switzerland, 2015 cohort

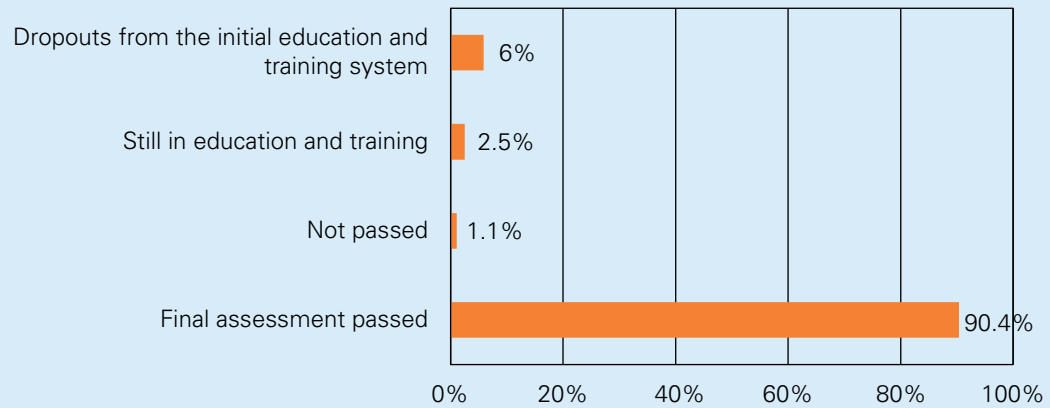


Source: Bundesamt für Statistik, 2020c. Chart: ETF

To calculate completion rates, a longer observation period of five-and-a-half years was chosen. Previous research had shown that the observation period has a significant influence on the results obtained, in particular with respect to four-year apprenticeship programmes.

Figure 6.5 shows the results for the three-year apprenticeship cohort of 2014. At the end of 2019, 90.4% of those who had started in 2014 had passed the final exam.

FIGURE 6.5 Status of certification – three-year apprenticeship in Switzerland, 2014 cohort



Source: Bundesamt für Statistik, 2020c. Chart: ETF



7. Benefits of work-based learning (outcomes)

In economic terms, the medium- and long-term effects of work-based learning consist of the employability and labour-market performance of the learners. The expectation is that learners with a WBL qualification have better employment and career prospects and face a lower risk of unemployment than participants in other types of VET programmes. In particular, a smooth transition to the first job after completing the training programme can be regarded as evidence of the effectiveness of WBL. From a pedagogical point of view, work-based learning is considered beneficial for the learners also in the sense that it gives access to further learning and continuing professional development, rather than being a 'dead end'. In a formal sense, this is the case when qualifications acquired in WBL programmes are recognised as fulfilling the entry requirements to pursue further learning opportunities, e.g. continuing vocational education and training (CVET) courses. Some of the learning outcomes acquired in a WBL programme may also be formally recognised as equivalent to parts of another learning opportunity (e.g. a degree programme), so that the subsequent period of study may be reduced accordingly. Apart from these formal aspects it might also be worth examining the extent to which the knowledge, skills and competence acquired through work-based learning actually enable the learners to thrive in the education system and in the professional world ('learning to learn' and 'learning to work' at the same time). The skills development of learners is also relevant for the analysis of costs and benefits (see Section 4.2), as a higher level of professional competence entails a higher level of productivity.

Potential indicators are the employment or unemployment rates of learners and the average length of the jobseeking period after completion of the WBL programme. For a longer-term perspective, career development in terms of salary and/or hierarchy level achieved could also be considered. In the context of the International Labour Organisation's (ILO) school-to-work transition surveys (see below), additional indicators have been proposed, which build on the concept of 'decent work' and reflect the quality of the transition process (Schomburg, 2016, p. 24).

Data on the performance of VET graduates in the labour market may already be available through official statistics, e.g. from employment agencies, but more often than not, especially when it comes to the monitoring and evaluation of programmes at the institutional level, these data will have to be collected first. The main instrument for doing so is tracer studies.

A tracer study, alternatively referred to as 'graduate survey', can be defined as a standardised survey of graduates of educational institutions. The survey takes place some time after graduation or immediately at the end of the programme in question and may cover a variety of topics related to the educational attainment, labour-market prospects and career development of the learners (Schomburg, 2016, p. 18). Traditionally, tracer studies or graduate surveys take place at the national level, which means they are commissioned



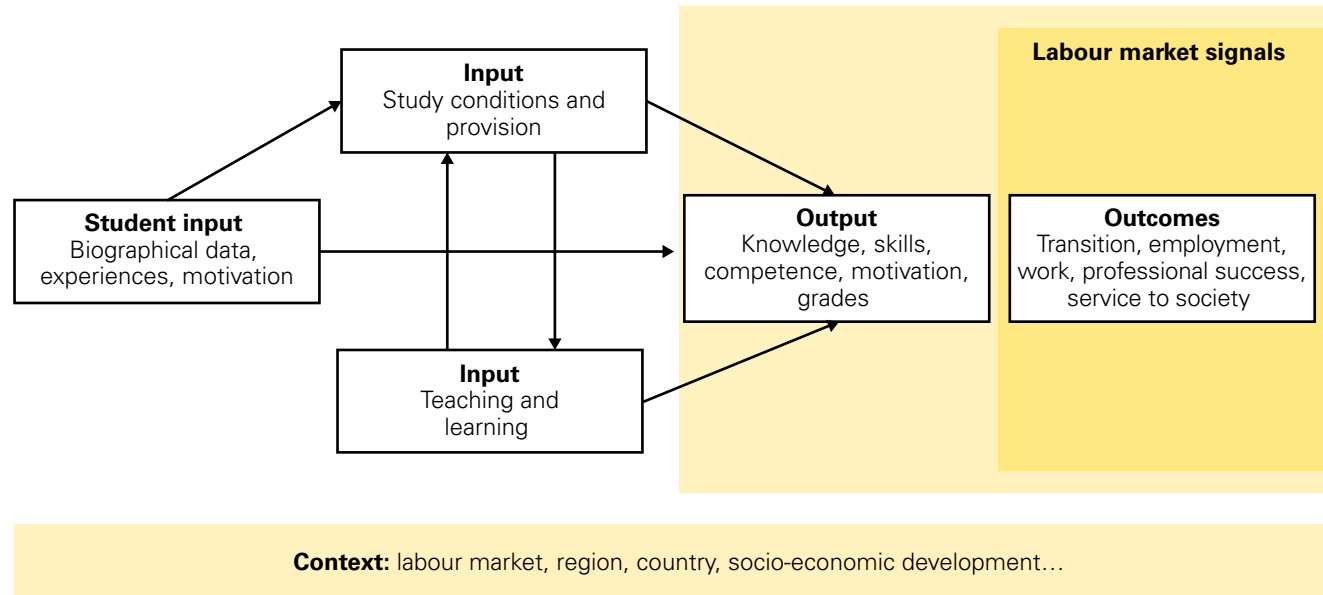
by national government bodies (e.g. ministries of education or ministries of labour) and conducted on the basis of representative nationwide samples. The approach is centralised in the sense that the study is conducted by one organisation, such as a research institute, while the role of training institutions is to provide technical support and access to potential respondents. National tracer studies are often carried out at regular intervals, e.g. every year (Switzerland, the Netherlands, the UK) or every three or four years (France) (Schomburg, 2016, pp. 16–22). Tracing graduates at the national scale has also been advocated by the European Commission as an instrument for assessing the quality of the education and for detecting possible weaknesses, such as skill mismatches (European Commission, 2017).

International tracer studies are an extension of the centralised national approach and are conducted to compare the performance of national education systems. International tracer studies, which are comparatively rare, are implemented in the context of multilateral projects or mandated by international agencies, such as the International Labour Organisation (Schomburg, 2016, pp. 22–4). A relevant example is the ILO programme for school-to-work transition surveys (SWTS), which has been conducting representative surveys in a total of 28 countries. The SWTS aims to analyse the youth labour market and the transition of young people into employment, with a view to supporting policy measures to address potential labour-market disadvantages or skill mismatches. The survey addresses two target groups, young people and enterprises. The SWTS originated from an ILO survey on gender equality in youth employment that was carried out in Indonesia, Sri Lanka and Vietnam in 2003. The following year, the analytical framework was expanded to cover the area of youth employment more broadly, and the above-mentioned concept of ‘decent work’ was included as the standard for developing criteria by which the quality of the transition from school to work could be assessed. This newly designed survey was implemented between 2004 and 2006 in Azerbaijan, China, Egypt, Iran, Jordan, Kosovo, Kyrgyzstan, Mongolia, Nepal and Syria. From 2011 onwards, the survey was taken to Eastern Europe, Latin America, the South Pacific and Sub-Saharan Africa in the context of the Work4Youth project run by the ILO and the MasterCard Foundation. The surveys were conducted by the national statistics offices in the target countries, with technical support from ILO experts. The datasets and main findings were made available through the ILO’s website, as were the national reports that were produced in each country on the basis of the survey results (Schomburg, 2016, p. 24).

Tracer studies may also be carried out by educational institutions themselves, either by one single institution or jointly, by several institutions. These institutional tracer studies constitute another main type and have gained relevance since the beginning of the 21st century. Rather than providing a basis for national policy making, institutional tracer studies aim to deliver information for the business process and quality management of the individual institution. In particular, institutional tracer studies generate feedback for the design of study programmes and curricula. In many cases, this feedback is regarded as the most important objective of institutional tracer studies (Schomburg, 2016, p. 25). This is a practical example of the Curriculum Value Chain model (see Chapter 2), according to which stakeholders use information on the performance of graduates in the labour market to revise and update curricula in accordance with the requirements of the employment system.

The general conceptual framework for tracer studies, which shows the main topics to be covered and how they relate to the process of school-to-work transition, is depicted in **Figure 7.1**.

FIGURE 7.1 Conceptual framework for tracer studies



Source: Schomburg, 2016, p. 39

COUNTRY EXAMPLE England – national tracer study

Since 2012, a system of national tracer studies with a focus on the evaluation of apprenticeships has been in place in England (Werquin, 2019, pp. 13–28). The evaluation scheme consists of two annual surveys that run in parallel and complement each other, namely the Apprenticeship Evaluation Learner Survey and the Apprenticeship Evaluation Employer Survey. The surveys are carried out by IFF Research on behalf of the Ministry of Education and aim to monitor the progress of the apprenticeship system, as well as assess the impact of policy reforms.

The Apprenticeship Evaluation Learner Survey covers four broad areas (Werquin, 2019, p. 10), namely the learners' motivation for doing an apprenticeship, their experience with the training programme, their overall satisfaction and the effects of the apprenticeship on their career. The latest survey for which a detailed description is available, the 2017 survey, was conducted between February and April 2017 by means of telephone interviews with 4,990 level 2 and level 3 apprentices plus another 835 level 4 apprentices. The sample was evenly divided between 'current apprentices', i.e. learners still registered as apprentices at the time the sample was drawn, and 'completed apprentices', i.e. those who completed their apprenticeships between 13 and 21 months prior to being interviewed. The questionnaire used for the interviews was divided into the following sections (Werquin, 2019, pp. 13–4):

- course and employer details (e.g. subject of the course, name of employer, type of contract, working hours, current employment status);
- deciding on an apprenticeship (e.g. reasons for starting an apprenticeship, details of the recruitment process);
- training (e.g. duration, number of learning hours per week, learning venues, methods of instruction, learning experiences in the workplace);
- satisfaction (e.g. overall level of satisfaction, comparison of expectations and actual experience, reasons for any dissatisfaction);
- perceived impact (e.g. skills gained, promotion or pay rise, attribution of the former to the apprenticeship, other benefits such as job satisfaction);
- future plans (e.g. likelihood of continuing working with the same employer or in the same sector, plans for further learning activities);
- demographics.

These characteristics are used for the calculation of indicators that aim to give a complete picture of the apprenticeship system from the learners' point of view. The indicators fall into five groups, which cover the entire process according to the conceptual framework of this handbook, from the input to the outcome stage.

The first group is termed 'Profile of apprentices' and characterises the apprentices in terms of features such as completion status, apprenticeship subject, gender and age. For the most part, this group of indicators does not directly relate to the outcome dimension as defined in the present handbook, an exception being the completion status. An overview of selected indicators from this first group is given in **Table 7.1**.

TABLE 7.1 Apprenticeship Evaluation Learner Survey: profile of apprentices (selected indicators)

Name	Description	Short definition
Completion status	Proportion of apprentices who completed their apprenticeship	Number of apprentices having completed their apprenticeship divided by the total number of apprentices
Apprenticeship subject areas	Proportion of apprentices by subject area	Number of apprentices in each broad subject area (business, health, engineering, retail, construction, IT, leisure, agriculture, arts and media, science) divided by the total number of apprentices
Gender distribution	Proportion of apprentices by level (2 or 3) and gender	Number of apprentices in each level (2 or 3) by gender divided by the total number of apprentices in each level (2 or 3)
Age distribution	Proportion of apprentices by age band, within subject area	Number of apprentices in each broad subject area and in each age band (19, 19–25, 25+) divided by the total number of apprentices in each broad subject area
NEET (not in education, employment or training) status before apprenticeship	Proportion of NEETs before entering apprenticeship	Number of those aged 16–24 and not in education, employment or training for at least three months in the 12 months prior to starting their apprenticeship divided by the total number of those who will enter apprenticeship

Source: Adapted from Werquin, 2019, p. 16

The second group, which is termed ‘Route into apprenticeships and motivations’, concerns the input rather than the outcome stage. This group includes indicators such as:

- recruitment into apprenticeships;
- employment prior to apprenticeship;
- application method;
- awareness of apprenticeships;
- reasons for choosing apprenticeships;
- whether apprenticeships were a preferred choice;
- alternatives to apprenticeships.

The third group is labelled 'Quality and content of apprenticeships' and obviously relates to the process stage. The indicators in this group include:

- duration of apprenticeships;
- employment status during apprenticeships;
- type of training undertaken while on apprenticeship;
- time spent on training while undertaking an apprenticeship.

The fourth and fifth groups deal with the effects of apprenticeship on the learners. The fourth group relates to the relatively 'soft' criterion of customer satisfaction and is labelled 'Satisfaction with apprenticeships'. Some of the indicators are presented in **Table 7.2**.

TABLE 7.2 Apprenticeship Evaluation Learner Survey: satisfaction with apprenticeships (selected indicators)

Name	Description	Short definition
Overall satisfaction among apprentices	Proportion of apprentices by overall satisfaction	Number of apprentices according to level of overall satisfaction (very satisfied, satisfied, dissatisfied) divided by the total number of apprentices (one group, e.g. very satisfied, could be mapped against subject areas)
Apprentices' satisfaction with 'relevance of training'	Proportion of apprentices reporting their satisfaction with different aspects	Number of apprentices reporting their satisfaction with individual aspects of apprenticeship on a scale from 1 to 10, divided by the total number of apprentices Usual categories: 0–4: dissatisfied; 5: neither dissatisfied nor satisfied; 6–7: satisfied; 8–10: very satisfied
Advocacy	Proportion of apprentices that would recommend apprenticeship and advocate the benefits of apprenticeship	Number of apprentices reporting they would advocate the benefits of apprenticeship or not, on a scale from 1 to 10, divided by the total number of apprentices Usual categories: 0–4: would speak critically; 5: indifferent; 6–7: would speak positively; 8–10: would speak highly positively

Source: Adapted from Werquin, 2019, pp. 19–20

The benefit in terms of ‘hard’ criteria, such as employment status or career prospects, is addressed by the fifth group, which is termed ‘Apprenticeships outcomes’. **Table 7.3** presents some of the indicators defined for this group.

TABLE 7.3 Apprenticeship Evaluation Learner Survey: apprenticeships outcomes (selected indicators)

Name	Description	Short definition
Skills gained during apprenticeships	Proportion of apprentices who felt they had gained ‘more appropriate skills/knowledge for area of work’	Number of apprentices who felt they had gained ‘more appropriate skills/knowledge for area of work’ divided by the total number of apprentices
Employment status of apprentices who had completed their apprenticeship	Proportion of apprentices reporting they are unemployed	Number of apprentices reporting they are unemployed divided by the total number of apprentices who completed their apprenticeship
Impacts at work	Proportion of apprentices who feel they are ‘better at doing job’	Number of apprentices who agree on the fact that they feel ‘better at doing job’ or not (disagree, neither agree nor disagree, tend to agree, strongly agree), divided by the total number of apprentices

Source: Adapted from Werquin, 2019, p. 20

It should be noted that this national tracer study does not follow an experimental or quasi-experimental design, i.e. the survey addresses only the target population and no control group. This is typical of national tracer studies. The possibilities of impact assessment are limited, therefore, in the sense that the survey delivers information about the success and performance of apprentices, but leaves open the question as to whether this performance can be attributed to the apprenticeship.

COUNTRY EXAMPLE Albania – institutional tracer study

In the context of the Skills for Jobs (S4J) programme of the Swiss Agency for Development and Cooperation (SDC), an initiative for introducing an apprenticeship system in Albania was launched in 2016. The aim of the project is to establish dual apprenticeship programmes within a system of school-based vocational education and training. While in the beginning only one vocational school participated in the project, the number of schools involved had grown to six by the 2018/19 academic year, with a total of 1,138 apprentices undergoing training in 436 companies (Posthumus, 2020, p. 2).

The apprenticeship model follows a similar logic to that of the Curriculum Value Chain model. Programmes are developed by the vocational schools, taking into consideration the feedback from employers on the employability of students. When necessary, curricula are updated according to the needs of employers. This means that the programmes follow the idea of demand-driven training (ibid., p. 4). The implementation of the training programmes is based on one-to-one relationships between vocational schools and enterprises, i.e. each school has its own network of companies that are willing to host apprentices. The cooperation is outlined in a memorandum of understanding signed by the school and the company in question. Training contracts are concluded between the school, the learner and the business. These tripartite agreements are concluded separately for the different phases of the training programme, and, typically, with different companies. Learners initially receive generic, sector-specific training in one company and subsequently undergo more specific, job-related training in another (ibid., pp. 5–6).

A Monitoring and Results Measurement (MRM) system was set up for the purpose of impact assessment and feedback, with a view to adapting the training programmes, if necessary. The MRM was established at the project level with the individual schools serving as points of reference, which is why it can be used as an example of an institutional tracer study, or, more specifically, a collaboration of several institutions on a joint tracer study. The core of the MRM system is a school-based tracing system, which surveys the participants of the apprenticeship programmes with regard to their transition to work and their future plans. The tracing system is designed as a census rather than a sample survey, meaning that the surveys address all of the students in a given cohort. The graduate surveys are implemented in two phases, namely a pre-tracer phase shortly before completion of the programme and a tracer phase that takes place between nine and 12 months after graduation (ibid., p. 14; Skills for Jobs, 2018, pp. 32–3). Both surveys are conducted by means of online questionnaires. The questionnaire for the pre-tracer survey is quite short (five questions) and concentrates on the learners' plans and expectations concerning employment. The questionnaire for the tracer survey is divided into three sections:

- labour-market outcomes,
- link between prior education/training and current work,
- socio-demographic data.

The questionnaire focuses on topics such as employment situation, working conditions, income, job searching, relevance of training and future plans (Posthumus, 2020, p. 14). In addition to the tracer survey, the MRM system includes annual assessments consisting

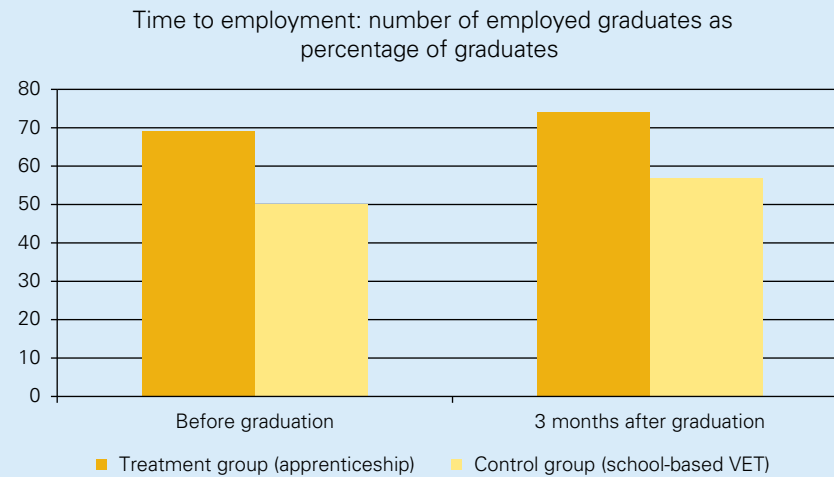


of in-house surveys of students, teachers and management at the participating vocational schools, focus group discussions, interviews and observations (ibid.; Skills for Jobs, 2018, pp. 34–5). The objective of these annual assessments is to collect the perceptions of schools, learners and enterprises concerning the implementation of apprenticeships at the different institutions.

The tracing system also serves as the basis for an impact analysis of the apprenticeship programmes. The impact analysis was based on a comparison between the students who participated in the apprenticeship programmes and a control group composed of students from other vocational schools that were not part of the project. The comparison had to be limited to two schools operating not only in the same sector (tourism and hospitality) but also in regions with comparable economic conditions (Posthumus, 2020, p. 17). Given that the treatment group and the comparison group were selected according to theoretical considerations and on the basis of already existing groups, this example represents a quasi-experimental design, as per the description in Chapter 2. Some differences already existed, therefore, between the treatment group and the control group before the intervention, i.e. the implementation of the apprenticeship programme in question, which means that different labour-market outcomes of the two groups can only be partly attributed to the apprenticeship programme. The impact analysis therefore adopted a ‘Difference in Difference’ (DiD) approach, according to which the impact of the intervention is equal to the difference between the two groups minus the difference already existing prior to the intervention.

Practically, the analysis was carried out by means of the online questionnaire for the tracer study, which was shared with the other school and distributed by the school itself among its students. Owing to the applicable privacy regulations it was not possible to obtain contact details of these respondents or to verify the composition of the control group or conduct follow-up interviews (ibid., p. 18). These limitations, together with the fact that the impact analysis was carried out at an early stage of the project, mean the results have to be regarded as preliminary. Still, the findings suggest early signs of an impact in the sense that graduates of the apprenticeship scheme find employment earlier than their colleagues who undertook school-based training (ibid., p. 11). While 69% of the graduates from the treatment group had already found a job before graduation, the corresponding figure in the comparison group was 50%. Three months after graduation, 74% of the treatment group were in employment, while only 57% of the comparison group had found a job by that time (see **Figure 7.2**).

FIGURE 7.2 Employment effect of S4J apprenticeship schemes in Albania



Source: Posthumus, 2020, p. 11

While this last example from Albania looks at the benefits of work-based learning schemes for learners, the potential benefits to companies are equally important (see Section 4.2 for a discussion of the financial resources, costs and benefits of WBL to companies).

8. International indicators on work-based learning

Owing to the diversity of national VET systems, work-based learning has traditionally been viewed from a country-specific perspective and has not played a major role in international comparative studies on education and training. In recent years, however, political initiatives, especially at the European level, to strengthen work-based learning (see Section 1.2) have increased interest in transnational comparisons and benchmarking. For instance, the Osnabrück Declaration, signed in late November 2020, calls for the exchange of information and peer-learning activities on innovative policy reforms in VET (Osnabrück Declaration, 2020, p. 6), which implies the need for comparison across country plans and measures, in order to identify good practices. As mentioned in Section 1.2 above, the [Council Recommendation on VET](#) stipulates, as a target, that by 2025, 60% of recent VET graduates should benefit from exposure to work-based learning during their training, setting a benchmark against which national VET systems and policies may be comparatively assessed, in principle. Country data from the 2021 European LFS will be used to measure the attainment of this objective, the target population comprising individuals aged 20 to 34 years who left education and training between one and three years previously.

From a purely scientific point of view, the variety of vocational education and training provision across countries is a challenge. However, it also offers a valuable opportunity: comparative research could be an effective method for investigating which features of VET systems and programmes have a positive effect on the labour-market outcomes for and socio-economic conditions of the participants (Kis, 2020, p. 9). Furthermore, it is argued that comparative analyses of VET are supportive of evidence-based policy making, with the aim of promoting quality, inclusiveness and efficiency in VET (Grollmann and Hoppe, 2011).

On another front, the OECD, building on previous work undertaken in collaboration with the European Union and the United Nations Educational, Scientific and Cultural Organisation (UNESCO), has identified four key areas of VET policy for which appropriate indicators and data are available at a transnational scale:

- structure of national VET systems,
- participation and profile of VET students,
- learning venues,
- resources dedicated to VET.

The last area covers both financial and human resources, i.e. the supply and qualification of VET teachers and trainers.

Regarding potential descriptors for comparative analysis, the first area can be covered by basic features, such as types of programmes, qualifications and institutions involved in VET. Another general feature that would fit into this category is the prevalence of work-based learning within the education system. **Box 8.1** shows how data from the 2016 LFS was used to compare the exposure of learners to work-based learning within formal education in different countries.

BOX 8.1 Data on work-based learning from the 2016 ad hoc module of the EU LFS

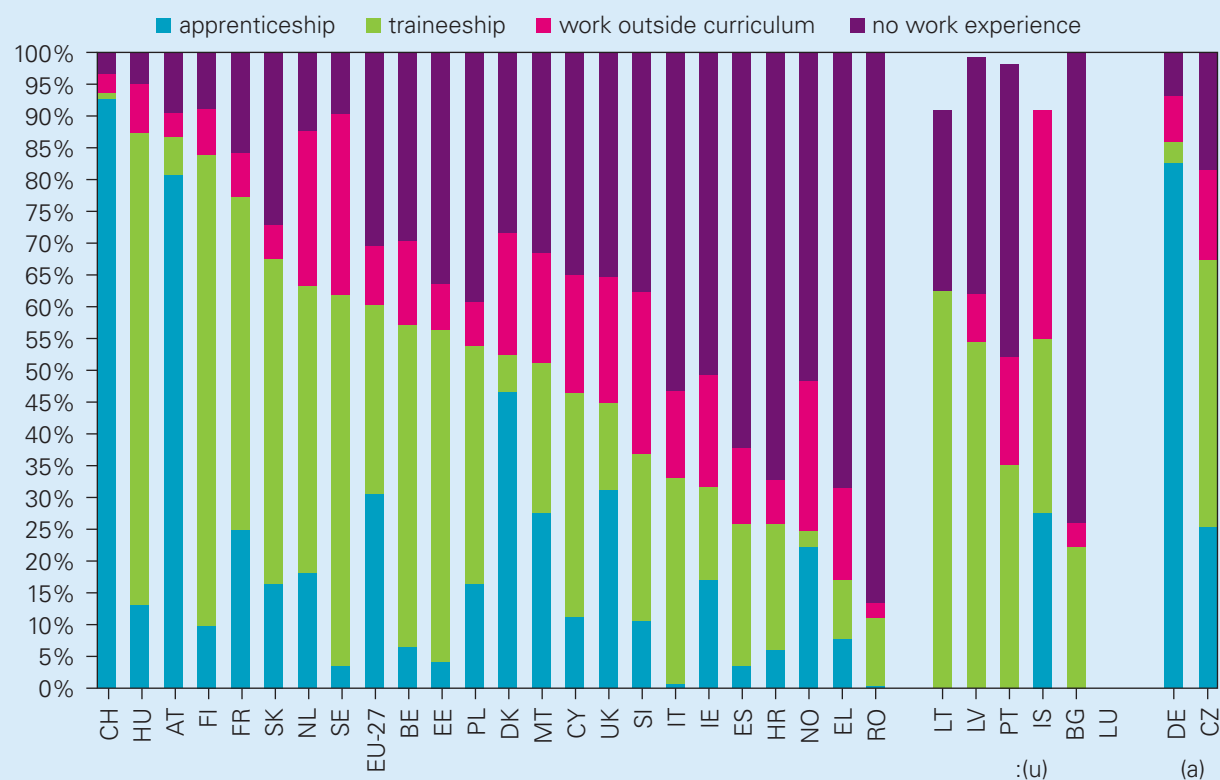
The ad hoc module covered the topic of young people on the labour market and provides data from the 27 Member States of the European Union, the United Kingdom, Iceland, Norway and Switzerland.

Detailed analysis of the data has been presented in a recent report from Cedefop (Cedefop, 2021). The report looks at work-based learning in formal initial education and training, and focuses on graduates who had work-based learning curricular experiences as part of their highest level of education attained. The analysis in the report is restricted to individuals aged 20 to 34 who were no longer in formal education at the time of the survey. It aims to provide EU-wide updated statistical evidence on the prevalence of work-based learning, socio-demographic profiling and labour-market outcomes. Furthermore, the report tries to answer questions on how many young graduates experienced work-based learning as part of their highest level of education attained, who they are and how well they perform on the labour market. In the survey, apprenticeship was defined as work experience occurring in the context of the highest level of formal education attained, whereby all of the following characteristics are combined: it is a mandatory part of the curriculum; it lasts six months or more; it is paid. Traineeship was defined as work experience occurring as part of the curriculum of the highest level of education attained and missing at least one of the above-mentioned characteristics for apprenticeship (Cedefop 2021, pp. 14f.)¹³.

Figure 8.1 shows the prevalence of work-based learning for graduates with, at most, medium-level qualifications of vocational orientation (ISCED 3–4 VOC). It was estimated that 31% of graduates from medium-level vocational education in the EU-27 did not have any work experience during their studies, 9% worked outside the curriculum, 30% spent time as a trainee; and 31% spent time as an apprentice. In 18 countries, more than 50% of graduates from medium-level vocational education (ISCED 3–4 VOC) participated in either traineeships or apprenticeships (Cedefop 2021, pp. 56ff.). The survey looks at the highest level of education successfully completed. Learners that were exposed to a work-based learning experience before entering tertiary education are therefore not counted.

¹³ Since 2019, the LFS follows a new definition of work experience at a workplace as part of the highest level of education attained. See Commission implementing regulation (EU) 2019: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R2240&from=EN>

FIGURE 8.1 Prevalence of work-based learning (traineeship and apprenticeship) and other types of work experiences: graduates aged 20–34, no longer in formal education with, at most, a medium-level qualification of vocational orientation (ISCED 35, 45)

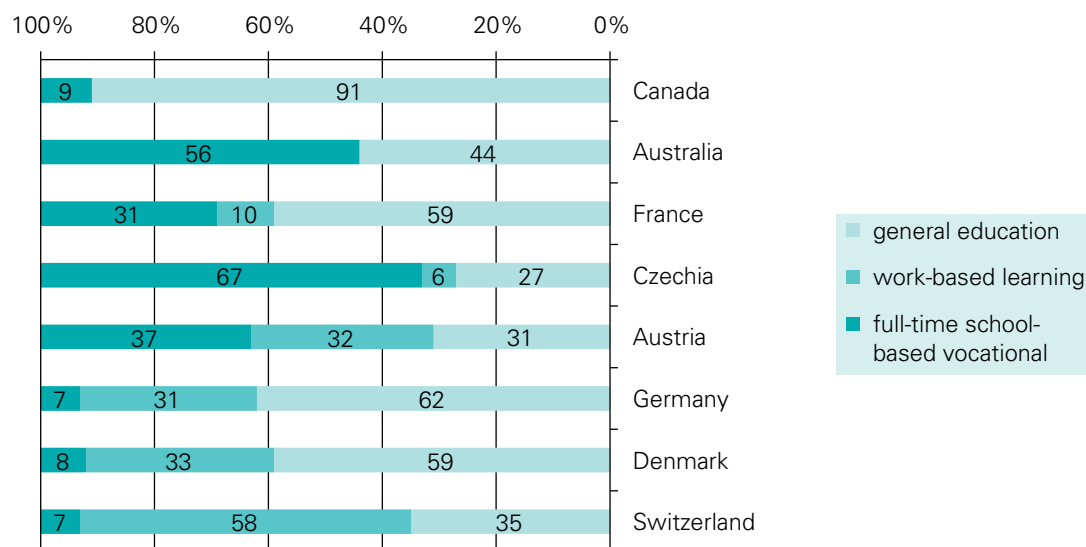


Note: :(u) – Flagged value, not published. (a) – High item non-response (>15%), results to be treated with caution.

Source: Cedefop 2021, p. 59

The participation of VET students can be measured and compared in terms of their enrolment rates (see Section 4.1). Here below is an example of how the percentage of students in different branches of education may be used for comparative analyses.

FIGURE 8.2 Percentage of upper secondary-level students in vocational and general education, 2016¹⁴



Note: These statistics cover courses of education with qualifications classified at ISCED level 3 (a, b, c). When comparing the data, it should be borne in mind that the length of the courses varies internationally (e.g. 12 or 13 years of schooling, compulsory education up to the age of 16 or 18). The data for Austria include pre-vocational education in the category 'full-time school-based vocational' (6%). The way the data is collected and categorised has recently changed. The figure reproduces data from the 2018 Education at a Glance report based on 2016, where the (small) share of work-based learning was not reported for the two countries Australia and Canada. In 2020, more differentiation was made for the first time and shares of work-based learning for upper secondary education are also shown for Australia but not for Canada. These were obtained on the basis of an ad hoc survey and differentiate the picture somewhat.

Source: BIBB, 2019, p. 494; and OECD, 2018 (Table B1.3, p. 161)

Another important indicator that provides evidence of the relevance of VET and work-based learning is the training ratio, which is discussed at length in Chapter 4. This indicator may also be used to analyse the characteristics of different national VET systems, as the following example shows. Here, in comparison to the preceding table, figures on Australia and Canada are more pronounced. This supports the interpretation that work-based learning should not only be regarded through the perspective of the educational but also as part of the employment system.

¹⁴ For Germany, the educational pathways were summarised as follows:
General education: grammar schools (upper secondary school), integrated comprehensive schools (upper secondary school), independent Waldorf schools (11th to 13th grade), special schools (11th to 13th grade), specialised secondary schools – two years old, specialised grammar schools, vocational schools that provide a qualification to study.
Vocational training: basic vocational programmes with credit transfer to the first year of apprenticeship (at vocational schools, basic vocational year). Vocational schools (dual system). Vocational schools that provide a fully qualifying vocational qualification (excluding health and social professions, educator training); one-year programmes in health professions (at vocational schools or schools of health care). Students in the so-called 'transition zone' are counted here.

Vocational training programmes are divided into work-based vocational training and full-time school-based vocational training. The category work-based (vocational) includes all programmes that are more than 25% on the job. Not included in ISCED level 3 are those pupils who have already completed a course of education or the baccalaureate and would now have to be assigned to upper secondary education a second time (education + baccalaureate, baccalaureate + apprenticeship, etc.).

EXAMPLE OF INDICATOR Training ratio in international comparisons

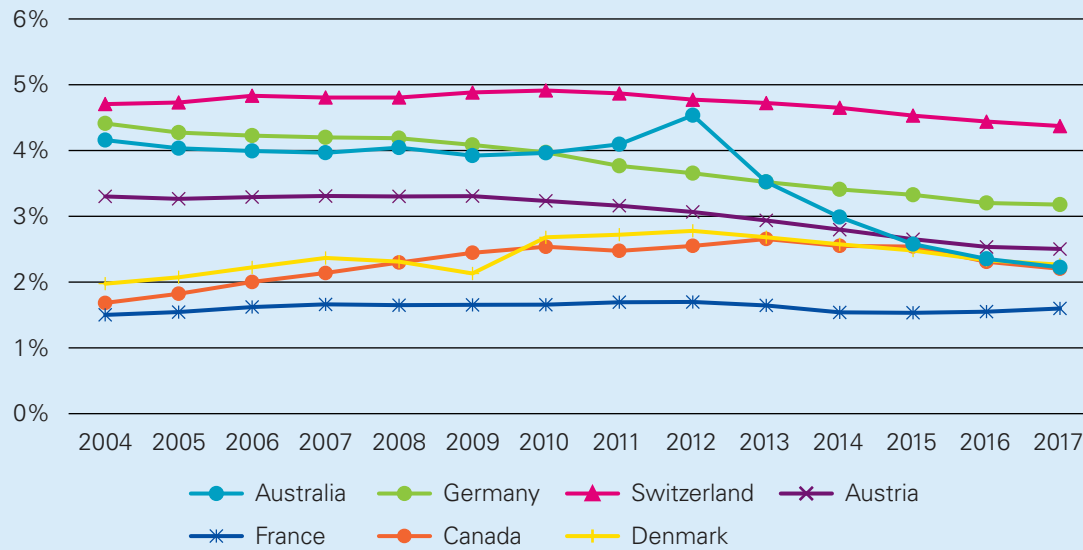
To measure the training ratio, the share of individuals with apprenticeship contracts (according to national legislation), regardless of the level of education (upper secondary or higher), in the total number of employed people in the respective country is calculated using the following formula (the higher the percentage value, the more significant the vocational training as contractually regulated, practical training in the company):

$$\left(\frac{\text{Number of individuals with training contracts}}{\text{Number of employees}} \right) \times 100$$

In Germany, the ratio of trainees to employees is calculated as the proportion of trainees as a percentage of employees subject to social insurance contributions. Since there are major national differences in the way employment relationships are organised, the training ratios were calculated on the basis of the number of employees (denominator) for the purposes of international comparison. The data on employed people are from the ILO; the data on in-company training relationships (numerator) are based on data from national training statistics. These apprenticeships are based on very different concrete regulations and arrangements regarding content and form. According to the ILO definition, an employee is any person of working age who has actually worked for at least one hour during a one-week reporting period for remuneration or as a self-employed or assisting person. Also, anyone in a formal employment relationship is considered gainfully employed even if they did not work during the reporting period, provided that the interruption was only temporary.

With regard to interpreting the training ratio, the absolute number of training contracts must always be differentiated from their share. For example, the absolute number of trainees may increase, but if the share of the working population rises even more, the training rate will be lower. Thus, an increase in the number of in-company training contracts does not automatically result in a higher training ratio. This can be seen in Switzerland, where, since 2004, the number of (absolute) training contracts has been increasing, but the training ratio has been slightly decreasing. A similar situation can be observed in France.

FIGURE 8.3 Training ratio trends – proportion of in-company trainees as a percentage of the workforce in international comparison



Source: BIBB, 2020, p. 422

Conclusions

Some essential indicators and tools have been presented in this handbook, along with components of the work-based learning process as viewed through the lens of the IPOO model. These core

elements of monitoring and evaluating work-based learning are briefly recapitulated here below.

IPOO components and potential indicators for monitoring and evaluating work-based learning

Components and sub-components of WBL	Indicators (examples)	Tools (examples)
Input		
How many companies participate in WBL and why? What are the costs of WBL for companies? How are curricula developed and aligned with labour-market needs? How are the skills of teachers and trainers being developed and kept up to date?	Company participation rate Supply and demand ratio Frequency of updates of VET curricula Qualifications of VET teachers and trainers Frequency of CPD activities	Registry of companies Survey/panel Company survey/cost-benefit analysis National VET reporting
Process		
How much time do learners spend in the workplace? How effective is the cooperation between the learning venues and how well are the two aligned with each other? To what extent are teaching and learning activities supported by digital technologies? Is the performance of learners assessed on a regular basis?	Share of WBL in the total training time Frequency of meetings between companies and training centres Frequency and variety of the use of digital technologies Digital skills of teachers, trainers and learners Share of completed examinations	National VET reporting Self-assessment (e.g. SELFIE)



Output		
How do learners perform in terms of competence development? How many learners complete WBL programmes? How many learners leave the system, and why?	Competence level of learners Completion and graduation rates Contract termination rate	Large-scale assessments (e.g. PISA, PIAAC) National VET reporting, e.g. on the basis of statistical data from competent bodies (chambers) or employment agencies
Outcome		
How many graduates of WBL programmes gain employment, and how quickly? What are the effects of WBL on the income of graduates? What are the benefits of WBL for companies? How satisfied are learners with their WBL programmes?	Percentage of graduates in employment (e.g. six months after graduation) Income level of WBL graduates compared with other groups of learners	Tracer studies Cost-benefit analysis

It has become obvious – not least in the wake of international advisory and development activities on the topic of work-based learning – that the importance of clear responsibilities and transparent regulation cannot be overestimated. It is therefore key, in addition to collecting data, to establish indicators and identify suitable tools and approaches, promote exchange between the (potential) actors in a data collection system and agree on a common goal (Hoppe, Burmester and Ebben, 2011; Eddington and Eddington, 2011). In the example above of reporting on VET in Vietnam, for instance, overall responsibility for coordinating data collection was assigned to the Ministry of Labour. In a best-case scenario, data to be collected, responsibilities and the use of indicators are clearly regulated, e.g. on the basis of a law. In many cases, the data are already available and only their systematisation and targeted evaluation need to be regulated. In some cases, adjustments in data collection

and the relevant characteristics are necessary. In the long term, responsibilities, data collection and relevant characteristics must be subject to recurrent revision, e.g. with regard to changes in current data collection techniques or in the characteristics of the education system. As well as being highly significant at the operational level, this results in additional tasks for those who are politically responsible for vocational education and training.

The application of some of the above-mentioned indicators in one integrated reporting system can be summarised in the form of an example from Germany. In its system of dual vocational education and training, information on the market for training places is systematically collected within the federal government's system of annual VET reports (Krekel and Milde, 2018).

COUNTRY EXAMPLE Germany – the VET reporting system

The legal basis for VET statistics and an annual report is Section 86 of the German Vocational Training Act (*Berufsbildungsgesetz*), according to which it is the duty of the Federal Ministry of Education and Research to submit, by 1 April of each year, a report on the state of the German VET system to the cabinet. Sections 87 and 88 regulate the purpose and implementation of vocational training statistics and the data to be collected. Thus, for each training contract, a set of socio-economic data is collected, regarding the likes of gender, year of birth, nationality of the trainees, region of origin and general school leaving certificate, field of specialisation, region of the training company, etc. (input and process). In addition, there are data on exam participation and exam success (output), and on training personnel (gender, year of birth, type of professional aptitude (process)).

The VET report and statistics draw on a variety of sources, most notably statistical data from the statistics offices of the federal and individual state governments, as well as the Federal Employment Agency, various authorities (e.g. chambers) with responsibility in the system and the BIBB's own surveys. The law also specifies who is responsible for the collection of what data in the complex network of federal players.

The annual Vocational Education and Training Report (*Berufsbildungsbericht*) has been published by the Federal Ministry of Education and Research (BMBF) since 1977. It covers the main developments in the VET system over the previous year, forecasts future trends and proposes policy measures to counteract any imbalances or disruptions in the VET system, if applicable.

The report must include at least the following indicators:

- number of training contracts concluded before 1 October of the previous year over 12 months, as reported by the competent bodies, i.e. the chambers of commerce and industry or similar bodies responsible for the supervision of training in a given economic sector;
- number of training places still vacant by 30 September of the previous year and number of individuals still in search of a training place by 30 September of the previous year, both as reported by the Federal Employment Agency;
- the estimated number of people expected to be in search of a training place over the period until 30 September of the current year; and
- the estimated number of training places available over the period up to 30 September of the current year.

Technical responsibility for the annual VET report lies with the Federal Institute for Vocational Education and Training (BIBB), which, according to Section 90 of the Vocational Training Act, 'collaborates' in the preparation of the report.

In practice, this shared responsibility of the BIBB and the BMBF is reflected in the structure of the VET report, which consists of a 'political' part (Part I) and a descriptive or non-political part (Part II). While Part I is officially authored by the BMBF, the main responsibility for Part II lies with the BIBB. Since 2009, the VET report has been accompanied by a comprehensive data report that is also authored by the BIBB.



This data report includes background information and analyses on initial and continuing vocational education and training in Germany, as well as international indicators and benchmarks. In addition, each issue of the data report features a thematic section in which a selected topic is treated in greater detail.

The main indicators used are the following:

- extended supply and demand ratio;
- rate of unsuccessful applicants (data supplied by the Federal Employment Agency);
- rate of vacant training places – note that vacant training places are taken into consideration only if they have been notified to the Federal Employment Agency. Since employers are under no obligation to do so, the real figures may be higher. The current development trend suggests that corresponding problems in the German training market are intensifying (Krekel and Milde, 2018, p. 288);
- immersion rate of young people interested in training – this indicator describes the share of young people interested in training who actually enter a training programme. It is a measure of the successful transition from school to work.



List of abbreviations and acronyms

ANQEP	Agência Nacional para a Qualificação e o Ensino Profissional (National Agency for Qualification and Vocational Education), Portugal	LFS	Labour force survey
BBL	Beroepsbegeleidende Leerweg (company-based part-time vocational training), the Netherlands	MRM	Monitoring and results measurement
BIBB	Bundesinstitut für Berufsbildung (Federal Institute for Vocational Education and Training), Germany	NIVET	National Institute for Vocational Education and Training, Vietnam
BMBF	Bundesministerium für Bildung und Forschung (Federal Ministry of Education and Research), Germany	PIAAC	Programme for the International Assessment of Adult Competencies
BOL	Beroepsopleidende Leerweg (school-based full-time vocational training), the Netherlands	PISA	Programme for International Student Assessment
Cedefop	Centre européen pour le développement de la formation professionnelle (European Centre for the Development of Vocational Training)	S4J	Skills for Jobs programme, Albania
CPD	Continuing professional development	SANQ	Sistema de Antecipação de Necessidades de Qualificação (system for anticipation of skills needs), Portugal
ETF	European Training Foundation	SBB	Samenwerkingsorganisatie Beroepsonderwijs Bedrijfsleven (Foundation for Cooperation on Vocational Education, Training and Labour Market), the Netherlands
ICT	Information and communication technology	SELFIE	Self-reflection on effective learning by fostering the use of innovative educational technologies [tool]
ILO	International Labour Organisation	SWTS	School-to-work transition survey
IPOO	Input, process, output and outcome model	TVET	Technical and vocational education and training
ISCED	International Standard Classification of Education	VET	Vocational education and training
		WBL	Work-based learning



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