# Editorial: Vocational Education and Training Systems Between School and Company

Dietmar Frommberger, Silke Lange & Christoph Porcher

A key feature of vocational education and training (VET) systems and specific vocational education programs lies in the integration of school-based learning processes with practical applications in the workplace. Within school-organized vocational learning processes, this connection is established through the subjects and content taught, which are linked—either in a more concrete or abstract form—to typical work and business processes. Additionally, school-based vocational education programs often include learning processes in workshops or laboratories. Practical work experience and problem-solving approaches also play a relatively significant role in traditional classroom instruction.

However, VET also includes learning processes that take place directly within the professional and company-specific experience space, thus considering the application context directly. This model of VET, in which learning processes predominantly occur outside of school, directly in companies and at the workplace, is traditionally and internationally referred to as "apprenticeships".

Apprenticeships are company-specific forms of socialization and qualification that are widespread across the globe (e.g. Baumann et al., 2020; European Centre for the Development of Vocational Training, 2018; Fuller & Unwin, 2013; International Labour Organization, 2020). Regarding their development, a distinction is often made between "formal apprenticeships" and "informal apprenticeships" (Gewer, 2021). The difference lies in the degree of standardization and legal regulation of company-based qualification processes. Formal apprenticeships are based on minimum standards, such as training contracts, defined training durations, regulated final examinations, curricula, ac-

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credited training authorizations, etc. Informal apprenticeships, on the other hand, take place through informal agreements between apprentices and the training company. Informal apprenticeships have traditionally been common, especially in crafts and small businesses, and this approach remains prevalent in many regions and countries today.

However, only in a few countries has this craft-based apprenticeship approach undergone significant formalization in the course of industrial development, gaining importance for widespread skills qualification and transition into employment across various economic sectors—especially in technical and commercial occupations (Greinert, 1999). In countries where apprenticeships have maintained and expanded their relevance, "dual apprenticeships" (Deißinger & Gonon, 2021, p. 197) emerged at the beginning of the 20th century, combining apprenticeships with school-based learning. The specific forms of these dual approaches have varied historically and continue to differ across countries, regions, and industries in terms of learning locations, cooperation between learning sites, curriculum design, and funding models (Bertuletti et al., 2025; Frommberger, 2022).

Internationally, however, school-based VET models have become predominant, closely integrated with general education systems and based on a meritocratic logic of education and qualification systems. Systematic learning in companies has remained largely outside of regulated vocational education systems (European Centre for the Development of Vocational Training, 2004; Frommberger, 2017). Nonetheless, even these school-based VET models now often incorporate strong connections to workplace practice by systematically integrating internships.

#### International and European Policies to Promote Dual VET Approaches

In bilateral and international cooperation in the field of VET, dual VET systems play a significant role (African Union, 2018; Council of the European Union, 2013; International Centre for Technical and Vocational Education and Training, 2018; Organisation for Economic Co-operation and Development, 2010). The reference frameworks for these often politically initiated programs are typically traditional dual apprenticeships. However, there is also a broader understanding of dual VET structures that includes systems where school-based vocational education is systematically combined with workplace learning experiences. One reason for this broader perspective is that school-based vocational education structures dominate in most countries, while traditional apprenticeships with strong company involvement are not widespread.

The European Union's VET policy has long aimed at enhancing the comparability and convergence of diverse vocational education structures. Between the 1950s and 1970s, the European Community sought to harmonize these structures. In the 1980s, and especially with the Maastricht Treaty of 1992, the EU shifted its focus—based on the principle of subsidiarity—to promoting mobility, recognition mechanisms, and transparency (Münk, 2010). Against this backdrop, in 1979, during the earlier phase of harmonization efforts, the Council of the European Communities adopted a resolution providing guidelines for member states on "alternating vocational education" (Rothe, 2003, 2004).

The concept of alternating vocational education aimed at fostering cooperation between schools and companies.

Strengthening companies as learning sites in vocational education and training and promoting collaboration between schools and businesses remained key objectives within the European Union throughout the 1990s. The 1994 White Paper Growth, Competitiveness, Employment—The Challenges and Ways into the 21st Century (European Commission, 1994) assigned vocational education and training a crucial role in combating unemployment and enhancing competitiveness. During the European Year of Lifelong Learning in 1996, the European Commission published its widely discussed White Paper on Education and Training: Teaching and Learning—Towards the Learning Society (European Commission, 1996), which became a milestone in shaping European vocational education policy. It emphasized opening general education to the world of work, involving companies in vocational education and training, promoting dual VET models, and increasing the mobility of apprentices.

At the beginning of the 2000s, VET gained further importance within the European Union. Initiatives such as the *Lisbon Strategy* of 2000, the *Copenhagen Declaration* of 2002, and numerous other programs reinforced VET as a crucial policy area. Following the economic and financial crisis of 2008, the *Youth on the Move* initiative highlighted VET approaches that strongly emphasized workplace learning. This employability approach was primarily aimed at combating high youth unemployment.

In the *Riga Conclusions* of 2015, the EU particularly emphasized the need to promote "work-based learning in all its forms, with special attention to apprenticeships, by involving social partners, companies, chambers, and VET providers". The *Riga Conclusions* reflected a broad understanding of dual VET models, encompassing both traditional dual apprenticeships and dual approaches that systematically combine school-based vocational education with workplace learning experiences or practical simulations.

This sketch shows that there is now a wide range of dual VET models worldwide that combine school-based and workplace-based learning. Traditional dual VET models often originate from apprenticeships, whereas newer dual VET models typically integrate school-based vocational education with systematically structured workplace learning and experience processes. The latter are gaining significance, even in higher education. Across various models, the temporal, content-related, and organizational linkages between school-based learning processes and workplace experience processes differ significantly (Frommberger & Schmees, in press).

#### Research on Firm Involvement in Dualized Apprenticeships

It seems that in the end, all European or international policies to promote dualized VET programs did not reach their desired goal. The existing literature on dualized apprenticeship acceptance by firms examines this issue through the lens of human capital theory, which distinguishes between general and firm-specific human capital. However, human capital theory comes to its limits when it raises the question of why firms offer apprenticeships.

In the German dual system, firms invest in apprenticeships, effectively contributing to general human capital. This contradicts traditional human capital theory, which assumes that companies primarily invest in firm-specific skills. However, this investment can still be rational if the labour market is imperfect (Schönfeld et al., 2016, p. 12). Contrary to traditional assumptions, young people who complete apprenticeships are often less mobile and less informed than expected. As a result, firms do not necessarily offer them the highest possible wages (Acemoglu & Pischke, 1998).

Therefore, Robert Lerman (2017) argues that traditional human capital theory must be adapted to explain why some firms provide more apprenticeships than others. His findings suggest that:

- Investment in apprenticeships should not be assessed solely based on cost but also on the improvement of information available to firms.
- · Political actors can enhance apprenticeship participation through advertising and standardized curricula, which help businesses recognize the benefits of apprenticeships.
- Integrating apprenticeships into secondary or post-secondary education increases • firm participation, as it allows them to hire and train young workers at lower wages.

Interestingly, both cited works, Lerman (2017) as well as Acemoglu and Pischke (1998) draw their evidence mostly from data collected from the German case but apply them to develop suggestions for other countries. Studies that mostly focus on a particular case apart from Germany come to the following conclusions:

According to a survey conducted for the U.S. government with the goal of identifying benefits for U.S. companies offering apprenticeships, the following metrics were identified (Helper et al., 2016, p. 2):

- "Production: Companies gain the value of output by apprentices and later by apprentice graduates, plus a reduction in errors.
- Workforce: Companies experience reduced turnover and improved recruitment, gain a pipeline of skilled employees, and develop future managers.
- Soft skills: Apprenticeships lead to improved employee engagement, greater problem-solving ability, flexibility to perform a variety of tasks, and a reduced need for supervision."

The plausible reason for companies not to invest in apprenticeships due to the fear of poaching is challenged by Robert Lerman (2019):

Economists have long believed that firms will not pay to develop occupational skills that workers could use in other, often competing, firms. Researchers now recognize that firms that invest in apprenticeship training generally reap good returns. Evidence indicates that financial returns to firms vary. Some recoup their investment within the apprenticeship period, while others see their investment pay off only after accounting for reduced turnover, recruitment, and initial training costs. Generally, the first year of apprenticeships involves significant costs, but subsequently, the apprentice's con-

9

tributions exceed his/her wages and supervisory costs. Most participating firms view apprenticeships as offering certainty that all workers have the same high level of expertise and ensuring an adequate supply of well-trained workers to cover sudden increases in demand and to fill leadership positions (p. 1).

His main message is:

Apprenticeship training is usually a profitable investment for firms as well as workers. Often, firms can recoup all or most of their costs within the apprenticeship period. By providing firms with information on economic returns, by helping them set up apprenticeships, and by funding off-site training, policymakers can promote the expansion of effective career training and increased worker earnings with only modest public expenditures (p. 1).

While certainly these arguments are helpful, other aspects seem to be neglected. For instance, the structural context in which companies can act is as important as their individual motives. The mentioned "structural context" can be translated into institutions that regulate the (vocational) education system. Examples for these institutions are laws or governing bodies. In the case of Germany, the chambers of commerce are an important institution for the functioning of the dual system. Why institutions may reduce the costs of apprenticeships for companies is explained by Lerman (2019). He suggests that "employers may simply lack institutional support and knowledge about how apprenticeship programs can increase profitability. After all, in countries with major initiatives to help firms understand and start programs (such as Australia and England), apprenticeship programs have expanded rapidly" (p. 9).

Against this backgdrop, a key question for vocational education studies is how the connection between school-based and workplace-based learning processes is established and organized and how these different systems have evolved historically.

Understanding VET across different countries and historical periods requires analyzing the current state and the development of various approaches to integrating and coordinating school-based and workplace-based learning. The following questions are particularly relevant in this context:

- **Macro level**: What legal standards ensure the quality of workplace-based and schoolbased vocational learning processes? Are there curricular standards (e.g., training regulations, syllabi), minimum quality requirements for the training capacity of companies and schools (e.g., through accreditations, certification of training capability), and qualification requirements for vocational educators in both settings (e.g., defined qualification prerequisites)? How are examinations and assessments for school-based and workplace-based learning outcomes standardized? What authorities oversee the actual quality of VET?
- **Meso level**: How is the organizational and content-related coordination between school-based and workplace-based learning structured? Are there regulations requiring school attendance or granting release time for apprentices to attend school? How are vocational learning processes in schools and workplaces coordinated

in terms of timing and content? Are there common curricula, or are school and workplace curricula aligned with each other?

• **Micro level**: How do vocational educators collaborate in implementing VET programs? How are learning processes in schools and workplaces interconnected? Are there cross-location coordination processes for planning and conducting instruction and workplace training?

Beyond these questions, two additional research objectives emerge: First, gaining explanatory knowledge about the development of dual vocational education systems—specifically, why certain dual structures have developed in particular countries and why they have not in others. Second, this explanatory knowledge can provide insights for shaping vocational education, particularly in designing and developing dual VET systems in a way that aligns with the specific national context.

## **About This Issue**

**Beifang Ma** and **Esther Winter** present a longitudinal analysis of school-workplace cooperation. Their study is based on a sample of 458 trainees in the industrial management occupation in Germany. Behind their study lies two quite interesting research questions: How organizational and pedagogical dimensions of subjective perception of school-workplace cooperation change throughout the entire training course across individual trainees? And: How do time-invariant and time-varying factors influence trainees' perceptions of school-workplace cooperation throughout their vocational training both at the organizational and pedagogical level? Their results allow an evidence-based discussion on the cooperation between school and company within a VET context.

**Fernando Marhuenda-Fluixá** and **Lorenzo Bonoli** compare and contrast the Spanish and Swiss case. Their focus lies on the highly relevant issue of inclusion at the upper secondary level of the respective education systems. By considering the demands of companies and the standardisation of VET curricula, which are necessary for high quality skilled labour, Fernando Marhuenda-Fluixá and Lorenzo Bonoli offer interesting results that will hopefully enhance the academic discussion.

In the **general section** of this issue, **Sietse Brands**, **Bas Kollöffel**, **Elwin Savelsbergh**, and **Maaike Endedijk** present their study on peer feedback in the Dutch VET system. They discuss the importance of carefully designed prompts and how they can contribute to better peer feedback formulation.

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