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Focus

Vocational Education Between School and Company

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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-

> 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 school-based 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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Thematic Section

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Longitudinal Analysis of School-Workplace Cooperation in Vocational Training

Exploring Time-Invariant and Time-Varying Predictors

Beifang Ma & Esther Winther

Abstract *School-workplace cooperation is a unique research field within the dual training system, where trainees' subjective experience of this cooperation is crucial for investigating training quality. In this study, we tracked 458 industrial administrative assistant trainees throughout their entire training period and modeled changes in their experience of one organizational and two pedagogical dimensions of school-workplace cooperation over time and across individual trainees. Using a Latent Growth Model (LGM), we included both time-invariant and time-varying predictors to explain the growth dynamics of these dimensions of trainees' experience of school-workplace cooperation. The results show that all three dimensions have unique growth dynamics over time and across individual trainees. The way predictors influence their growth also differs significantly from each other. Among the dimensions, the practical relevance of school learning shows a decline and is the most sensitive to predictors. The integration of specialized knowledge has seen an increase but can rarely be explained by factors included in this study. The transparency and organization of training dimension has remained relatively stable.*

Title *Longitudinal Analysis of School-Workplace Cooperation in Vocational Training: Exploring Time-Invariant and Time-Varying Predictors*

Keywords *school-workplace cooperation, Latent Growth Model (LGM), time-invariant predictors, time-varying predictors*

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1 Introduction

In countries with prevalent dual vocational education and training (VET) systems, such as Germany, Switzerland, and Austria, the distribution of learning sites between companies and vocational schools characterizes the uniqueness of VET. This dual structure opens up a crucial and irreplaceable research area that significantly differs from research in general education systems. Unlike general education, which typically focuses on school-based learning, dual VET systems uniquely combine two distinct learning sites—companies and vocational schools. This not only requires organizational cooperation between these sites but also necessitates the integration of practical, workplace-based training with theoretical education. This distinctive context allows for the study of how educational and vocational institutions collaborate, how knowledge is transferred between schools and workplaces, and how these elements contribute to the development of students' professional competencies.

The term "site" here implies more than a mere temporal or spatial separation, but rather emphasizes the pedagogical functions they fulfill in the learning process (Tippelt & Reich-Claassen, 2010; Bundesinstitut für Berufsbildung [BIBB], 2017). This characteristic of allocating pedagogical functions to distinct learning sites—companies providing practical on-the-job skills and schools delivering theoretical education—and integrating these components is closely associated with the concept of cooperation. Unlike coordination, where tasks and processes are merely aligned but carried out independently, cooperation in VET means that the tasks and processes cannot be executed without the involvement of both partners (Buschfeld, 1994, pp. 126–127). This cooperation between training companies and vocational schools in VET is defined as organizationally working together, always based on pedagogical principles (Pätzold, 2003). Accordingly, school-workplace cooperation in Germany within the dual apprenticeship system can be concreted as the organizational and pedagogical collaboration (Sekretariat der Kultusministerkonferenz, 2018, p. 33). The pedagogical guiding principle of school-workplace cooperation is the integration of theoretical knowledge with the practical skills of the learned profession and the reflection on this connection (Marwede & Stolley, 2012, p. 5). This integration and reflection have been operationalized by Aprea and Sappa (2015) as bidirectional transfer processes of boundary-crossing skills.

In addition to studies on factors affecting school-workplace cooperation in VET, particularly within German-speaking research and focusing on the dual apprenticeship system in Germany, some studies investigate this cooperation from institutional aspects (e.g., Aprea & Sappa, 2015). Several other studies explore the subjective perspective of trainees (e.g., Wenner, 2022; Berger, 1999). In the research field of general education, the significance of students' subjective perception has been increasingly confirmed, as students' school experience significantly impacts their school-related outcomes (Thapa et al., 2013). For VET research, this underscores the importance of identifying specific aspects of the trainees' experience that can be controlled, to some extent, through training policies, procedures, and practices. Also, VET research suggests that the trainees' subjective perception of the training reality is particularly crucial for investigating training quality (Heinz, 1991; Jungkunz, 1995; Lempert, 1998).

Findings about factors influencing trainees' perceived school-workplace cooperation in the context of the German-speaking VET system show a heterogeneous and unclear picture. Beicht et al. (2009) and Ebbinghaus (2016) have empirically confirmed that the perceived training quality in smaller companies generally lags behind that of larger companies. Although this is not direct evidence about school-workplace cooperation, empirical findings suggest that apprentices who rate the quality of their training highly also perceive better coordination between learning sites (Berger, 1999). This indicates that company size may influence trainees' perception of school-workplace cooperation. Interestingly, this assumed relationship between company size and perceived school-workplace cooperation was not confirmed by Wenner (2022). Furthermore, the level of prior educational attainment correlates with perception of school-workplace cooperation (Berger, 1999). It implies that the higher the educational attainment of the apprentices, the poorer their evaluation of school-workplace cooperation. However, this assumed correlation between prior educational attainment and perceived school-workplace cooperation was not statistically significant in Wenner's (2022) study. Moreover, the degree of digitization in vocational training increasingly plays a role in school-workplace cooperation (BIBB, 2021). This relationship is confirmed by Freiling and Saidi (2022) using qualitative methods. Risius and Meinhard (2021) also investigated how digitization in VET influences the subjectively perceived school-workplace cooperation, but from the perspective of trainers.

Special research interest has been drawn to the impact of the COVID-19 pandemic, which significantly influenced the global educational system at multiple levels, especially during 2019–2021. This crisis is an issue that should not be ignored in educational research investigating students' school-related experiences during this period. Vocational schools were affected by times of complete closures during the 2019/2020 and 2020/2021 school years in Germany. While the impact of the closure of general education schools was extensively discussed in the media, the area of dual vocational training has received little attention, despite the significant disruptions caused by the pandemic. The Industrie- und Handelskammer (IHK, Chamber of Industry and Commerce) midterm exams were canceled without replacement, central vocational final exams were postponed, and both company-based and school-based learning processes had to quickly adapt to the current conditions to maintain training programs and goals, ensuring a qualified professional certification. Freiling et al. (2022) analyzed the impact of this pedagogical crisis on school-workplace cooperation in German VET using qualitative interviews and descriptive statistics. Their study indicates the necessity of considering COVID-19 pandemic-related predictors when explaining school-workplace cooperation.

While these earlier studies delving into school-workplace cooperation of the German-speaking VET system are insightful, there are several areas for optimization. Firstly, some studies focus on training quality and treat school-workplace cooperation only as a subdimension (e.g., Beicht et al., 2009; Ebbinghaus, 2016). Consequently, the explanatory power of predictors identified for training quality on school-workplace cooperation is unclear. Secondly, some studies use qualitative methods and achieve exploratory results (e.g., Freiling et al., 2022; Freiling & Saidi, 2022). While qualitative studies are primarily exploratory, it is sensible to use quantitative methods to further verify and quantify these results. Thirdly, previous studies investigating the factors

affecting trainees' perceptions of school-workplace cooperation have often treated it as a single, uniform construct (e.g., Wenner, 2022). This is despite the existence of theoretical frameworks suggesting the heterogeneity of school-workplace cooperation. One reason for this discrepancy might be that these theoretical frameworks are not specifically tailored to trainees' subjective perceptions of school-workplace cooperation. Consequently, some dimensions may not be assessable from trainees' perspectives (e.g., formal communication strategies between schools and training companies as discussed by Aprea & Sappa, 2015). Nonetheless, these theoretical works still indicate that the construct of school-workplace cooperation is not uniform. Fourthly, focusing on the studies investigating trainees' experience of school-workplace cooperation, there is a lack of longitudinal research methods. One of the foundational goals of contemporary educational research is to systematically construct a reliable and valid understanding of the trajectories of students' school-related outcomes. To achieve this, longitudinal studies have long been essential and are becoming increasingly prevalent in empirical research focusing on the development of students' school-related outcomes. Employing a longitudinal design is crucial for both the outcome and explanatory variables. For the outcome variable, a longitudinal design can track changes in the perception of school-workplace cooperation throughout the training period, thus providing a comprehensive understanding of how these perceptions evolve over time and the factors influencing these changes. For explanatory variables, a longitudinal design allows the categorization of predictors into time-invariant predictors, which differ among individuals but remain constant over time (e.g., gender, school-entrance age, and migration background), and time-varying predictors, which differ among individuals and change over time (e.g., trainees' self-evaluation or experiences during the COVID-19 crisis). Thus, employing a longitudinal design enables a more nuanced analysis of how different types of predictors influence school-workplace cooperation over time, providing a deeper and more accurate understanding of these dynamics.

The presented study aims to close these research gaps by employing longitudinal data collected throughout the entire training course. To observe the growth of different dimensions of trainees' experiences with school-workplace cooperation across both training years and individual trainees, we used a latent growth model (section 3.3). To provide a more valid and comprehensive prediction of trainees' experience of school-workplace cooperation, we consider both person-specific time-invariant predictors and the concurrent impact of person-time-specific characteristics. Given that this study was conducted during the pandemic period, we specifically include the effect of corona measures taken by training institutes, rather than ignoring it. By extending the growth curve model to incorporate time-varying covariates, we aim to monitor and explore how these dynamic factors influence trainees' experiences, including their perceptions of school-workplace cooperation.

The study focuses on the vocational training program for *Industriekaufleute* (Industrial Management Assistants), a popular apprenticeship occupation in Germany's dual system (Statistisches Bundesamt, 2023). This program prepares trainees for a broad range of roles in various sectors, including manufacturing, service industries, trade, logistics, finance, and healthcare (BIBB, 2021). Trainees in this program typically work in departments such as accounting, human resources, marketing, logistics, and

procurement, gaining essential skills in business operations, financial management, and organizational processes. Upon completion of their training, they are equipped to work in administrative and management positions within companies across different industries (BIBB, 2021; Industrie- und Handelskammer [IHK], 2022).

The *Industriekaufleute* apprenticeship typically lasts for three years and is structured around the dual system, which combines practical, on-the-job training in companies with instruction in vocational schools (Deissinger, 2015; Cedefop, 2024). The program's curriculum includes financial accounting, cost control, human resources management, procurement, and logistic, as well as communication skills and business law. The training aims to provide a holistic understanding of business operations, preparing trainees for future management or specialized administrative roles (BIBB, 2021). Trainees spend three to four days a week at their companies and one to two days in vocational schools, where they receive theoretical instruction that supports their practical training. This combination of work-based learning and classroom education is designed to help trainees apply theoretical knowledge to real-world business scenarios, thus enhancing their professional competence and readiness for the workforce (Kultusministerkonferenz [KMK], 2021).

2 Research Question and Operationalization

The research question of the presented study is how the 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? This research question encapsulates the core of the study, emphasizing both the static (time-invariant) and dynamic (time-varying) elements that we are examining in relation to school-workplace cooperation.

The trainees' perceptions of school-workplace cooperation are operationalized as practical relevance of school learning, integration of specialized knowledge and transparency and organization of training. While the first two dimensions focus on the school-workplace cooperation at pedagogical level, the last dimension addresses the cooperation at the organizational level. The dimension practical relevance of school learning evaluates the extent to which vocational schools provide specialized knowledge that is directly applicable to the trainees' work in the company. It focuses on how the school reinforces practical skills with theoretical background information and helps students understand the connection between classroom content and workplace practices. The dimension integration of specialized knowledge measures how well the knowledge and skills acquired in vocational school are integrated and applied in the workplace. It assesses the alignment between the curriculum taught in school and the practical tasks performed in the company. Both pedagogical dimensions highlight bidirectional transfer processes of boundary-crossing skills (Aprea & Sappa, 2015), while the first dimension (Practical Relevance of School Learning) is concerned with the immediate application of school knowledge to daily work tasks, the second dimension (Integration

of Specialized Knowledge) emphasizes the deeper theoretical support and specialized insights that vocational school provides to enhance practical skills and understanding in the workplace. The organizational dimension (Transparency and Organization of Training) assesses the clarity and systematic organization of the training process between school and training company from the trainee's perspective.

The focus on the practical relevance of school learning and the integration of specialized knowledge gained in school is driven by two key considerations. First, since the ultimate goal of vocational education is to prepare trainees for careers in companies, it is essential to assess how school-based knowledge and skills are applied in the workplace. The emphasis lies on ensuring that the school-based education aligns with and supports the trainees' long-term professional development in their future roles at the company. Conversely, evaluating how company-based skills influence school learning would shift the focus from workplace readiness to school-based education, which is not the primary aim of vocational training. Second, although these dimensions are formulated to assess the relevance and integration of school-based learning, they inherently imply an interactive relationship between the two learning environments. The concepts of "relevance" and "integration" inherently suggest a bidirectional dynamic, as they depend on the connection between theoretical knowledge from school and its practical application in the workplace. Therefore, these dimensions capture the cooperation between school and company as a mutually reinforcing process, rather than a unilateral flow of knowledge. By focusing on these dimensions, the study aims to evaluate how well vocational schools and companies collaborate to provide trainees with the comprehensive skills needed for their professional careers, ensuring the practical applicability of their education in real-world contexts. However, we recognize that the quality of company-based training is equally important in evaluating overall cooperation. The dimension of transparency and organization of training was included to address the collaboration between school and workplace from an organizational perspective, ensuring the coordination between both learning environments.

Time-invariant predictors include at first the size of the training company. In addition to the number of employees, as tested by Beicht et al. (2009) and Ebbinghaus (2016), we also considered the size of the city in which the training company is located. Regarding the time-invariant predictor of prior educational attainment, we aim to gain better insight into the previously inconsistent findings concerning the relationship between trainees' perceptions of school-workplace cooperation and their level of prior educational attainment (Berger, 1999; Wenner, 2022). Therefore, we included the highest school leaving certificate as indicator of prior educational attainment and extended the scope of educational level to incorporate the average grade on the final school report as a time-invariant predictor, and the trainees' expected grades. Notably, trainees' expected grades are treated as a time-varying predictor, assumed to be a dynamic indicator of prior educational attainment. Trainees continuously adjust their expected grades based on their prior attainment throughout their training. In addition to trainees' expected grades, we also integrated their experiences with the measures implemented by companies and schools to address the challenges posed by the COVID-19 crisis as a crucial time-varying predictor (Freiling et al., 2022). The digitalization level of their training is treated as a time-invariant predictor, serving as a contextual factor. We utilize the spoken lan-

guage at home as an indicator of migration background. Additionally, we include variables such as entrance vocational training age and gender. While these variables have not been previously studied or confirmed as predictors of perception of school-workplace cooperation, they have been empirically confirmed to influence trainees' dropout behavior (BIBB, 2022; Lange, 2020). Table 1 summarized all time-varying and time-invariant predictors.

Table 1: Overview of Predictor Types

Predictors	**Type***	**Time Point of Measurement**
Age (short for entrance vocational training age)	TIP	T0
Gender	TIP	T0
Language (short for the spoken language at home)	TIP	T0
Company size (short for the number of employees of the training company)	TIP	T0
City size (short for the size of the city in which the training company is located)	TIP	T0
Digital level (short for the trainees' evaluation of the digitalization level of their training)	TIP	T0
Educational level (short for trainees' level of prior educational attainment before entering their current training)	TIP	T0
Prior grade (short for trainees' final grades from their prior educational attainment before entering their current training)	TIP	T0
Expected grade (short for trainees' expected grades during their training)	TVP	T0,T1,T2
Corona measures (short for trainees' experiences with the measures implemented by companies and schools to address the challenges posed by the COVID-19 crisis)	TVP	T1,T2

* TIP: short for time-invariant predictor; TVP: short for time-varying predictor

T0, T1, and T2 correspond to the first, second, and third training years, representing key phases in the trainees' development. These timeframes are part of a longitudinal design that tracks the trainees' experiences over the entire training period, from the beginning of the apprenticeship (T0) through the midpoint (T1) to the completion of their training (T2). This design reflects the full change trajectories of trainees' perceptions of school-workplace cooperation. By capturing data at these three distinct points, we are able to observe how trainees' perceptions evolve throughout their training. In the early stages (T0), trainees are more focused on school-based learning, while by the final stage (T2), they have had significant workplace experience and are better able to assess the integration of theoretical knowledge with practical application. This longitudinal approach allows for a detailed examination of the dynamic interplay between school-based and

workplace-based learning and provides a comprehensive view of how perceptions shift over time.

3 Methods

3.1 Sample

Data was gathered in autumn 2019 (T0), autumn 2020 (T1), and autumn 2021 (T2). The dataset comprises 458 trainees training to become industrial management assistants who completed the survey at all three stages. In the sample, 64 % of the trainees were female, which is consistent with the statistical population (58.4 % female; Bundesinstitut für Berufsbildung [BIBB], 2020). The average age at T0 was 19.66 years (ranging from 15 to 31 years), nearly identical to the average age (19.7 years) of the statistical population at the beginning of training (BIBB, 2020). Most trainees live in families where only German is spoken (75.9 %).

3.2 Instrument

Outcome variable trainees' experience of school-workplace cooperation encompasses three dimensions: practical relevance of school learning (four items), integration of specialized knowledge (three items), and transparency and organization of training (three items). All three dimensions were measured on five-level Likert scales (0 = strongly disagree; 4 = completely agree) at T0, T1, and T2.

All TIPs were measured at T0. The educational level comprises four levels of German school leaving certificates obtained from different school types: *Hauptschulabschluss* (below a secondary school level), *Mittlere Reife* (corresponding to a secondary school certificate), *Fachhochschulreife* (enabling advanced technical college studies), and *allgemeine Hochschulreife* (allowing university studies). The scale level of digitalization assesses the integration of digital tools and platforms in the trainees' learning environment on a five-level Likert scale (0 = strongly disagree; 4 = completely agree). It includes three items on the use of electronic documentation, video archiving, and networked communication, providing an overview of how digital methods enhance vocational training processes. For more information about TIPs see Appendix Table A1.

The TVP expected grade, collected at T0, T1, and T2, was measured on a scale ranging from 1.0-1.5 (highest) to 3.1-3.5 (lowest), capturing trainees' anticipated academic performance throughout their training. Soon after the onset of the pandemic, at T1 and T2, we included a five-level Likert single-item-scale to assess trainees' satisfaction with the compensatory measures implemented by companies and schools during the pandemic.

3.3 Analytical Procedure

The latent growth model (LGM) is used to analyze items across time in longitudinal studies, where the researcher is interested in modeling and assessing growth trajectories. In this study, we aim to model the trajectory of trainees' experience of school-workplace co-

operation among a cohort of industrial management assistants throughout their vocational training. Unlike other longitudinal data analyses that model trajectories by pooling all individuals within the sample, a special characteristic of LGM is its ability to represent the variance of individual trajectories around these group means. For example, panel regression estimates the mean intercept (i.e., starting point) and mean slope (i.e., rate of change) that jointly define the underlying trajectory for the entire sample. In contrast, LGMs estimate the between-person variability in the individual intercepts and slopes. Additionally, LGM approaches are highly flexible in terms of the inclusion of time-invariant (TIPs) and time-varying predictors (TVPs). TIPs can be incorporated to predict the growth factors, such as the random variability in starting point and rate of change. This directly evaluates hypotheses about whether individual characteristics (e.g., gender and school entrance age) are predictive of higher or lower starting points or steeper or less steep rates of change over time (Curran et.al., 2004; Curran et al., 2010). While TIPs directly predict the growth factors (Bollen & Curran, as cited in Curran et al., 2010), whereas TVPs directly predict the repeated measures while controlling for the influence of the growth factors (Bollen & Curran, as cited in Curran et al., 2010). For example, in this study, we analyzed the individual trajectories of changes in trainees' experience of school-workplace cooperation throughout their training. Rather than attributing the variability around the best-fit line for individual trajectories at each time point to unexplained random errors, we propose that part of these residuals might be attributed to occurrences during specific times, such as trainees' expectations of their goal grades or the impacts of the COVID-19 pandemic.

4 Results

4.1 Preliminary Analysis: Scale Statistics

Firstly, we checked the reliabilities of all scales comprising more than two items. The detailed results are listed in Appendix Table A2. The Cronbach's alpha of the scale measuring Practical Relevance of School Learning at three time points ranges from 0.72 to 0.79, indicating good internal consistency. The Cronbach's alpha of the scale measuring Integration of Specialized Knowledge at three time points ranges from 0.66 to 0.79, reflecting acceptable to good internal consistency. The Cronbach's alpha of the scale measuring Transparency and Organization of Training at three time points ranges from 0.64 to 0.67. While this is lower than the commonly accepted threshold for psychological scales, it is still considered acceptable for non-psychological scales, where lower reliabilities are more tolerable due to the complex and multifaceted nature of the constructs being measured (e.g., Schmitt, 1996). Additionally, the scale measuring the TIP digitalization level has a Cronbach's alpha of 0.72, demonstrating good internal consistency. Overall, these reliability coefficients suggest that the scales used in the study are reasonably consistent in measuring the intended constructs across different time points.

Trainees' overall satisfaction with the compensatory measures implemented by companies and schools during the pandemic increased from 2020 to 2021, while their expected grades decreased across the three years. All three dimensions of their experience

of school-workplace cooperation decreased over the same period, with the Practical Relevance of School Learning experiencing the steepest decline. The reasons for these trends will be analyzed in the next section. Detailed descriptive statistics are provided in Appendix Table A2.

4.2 Latent Growth Model

We conducted three rounds of Latent Growth Model (LGM) analyses for each dimension of trainees' experiences with school-workplace cooperation, utilizing both TIPs and TVPs. The results are summarized in Table 2.

It can be observed from Table 2 that, the growth trends, growth curve across individual trainees and the effects of predictors on outcomes differ for each dimension of trainees' experiences with school-workplace cooperation. These results also highlight the necessity of avoiding the treatment of trainees' experiences with school-workplace cooperation as a single, uniform construct.

Table 2: Results of Growth Curve Model of Experience of School-workplace Cooperation

	Trainees' Experience of School-workplace Cooperation		
	Practical Relevance of School Learning	**Integration of Specialized Knowledge**	**Transparency and Organization of Training**
Intercept	3.551***	1.823***	2.744***
Slope	-1.184***	1.015**	-0.462
Var(intercept)	0.288***	0.062	0.190**
Var(slope)	0.036***	0.105**	0.065*
r(intercept and slope)	-0.118**	-0.041	-0.001

			Trainees' Experience of School-workplace Cooperation		
			Practical Relevance of School Learning	**Integration of Specialized Knowledge**	**Transparency and Organization of Training**
TIPs	Language	on intercept	0.057	0.030	0.092
		on slope	0.014	0.018	-0.085
	Gender (0,female; 1,Male)	on intercept	-0.169*	0.010	-0.059
		on slope	0.041	-0.108	-0.048
	Age	on intercept	-0.040*	-0.021	-0.027
		on slope	0.023	-0.012	0.022
	Digital level	on intercept	0.066	0.070	0.054
		on slope	-0.056*	-0.042	0.005
	Educational level	on intercept	-0.011	0.050	0.110*
		on slope	0.018	-0.028	-0.096**
	Prior grade	on intercept	-0.038	-0.015	-0.011
		on slope	0.026	0.017	-0.034
	Company size	on intercept	0.016	-0.026	-0.017
		on slope	-0.003	-0.025	-0.014
	City size	on intercept	-0.073	0.020	-0.002
		on slope	0.035	-0.003	-0.033
TVPs	Expected grade	on outcome T0	-0.100*	-0.001	0.059
		on outcome T1	-0.182***	0.144**	0.129**
		on outcome T2	0.100***	0.026	0.024
	Corona measures	on outcome T1	0.106**	0.046	-0.032
		on outcome T2	0.097**	0.015	-0.001

* p < .05, ** p < .01, ***p < .001

Concerning the results of LGM for Practical Relevance of School Learning, intercept=3.551 (p<.001), slope=-1.184 (p<.001) which means that the experienced Practical Relevance of School Learning in the first semester (T0) is 3.551 and for every sequential training year Practical Relevance of School Learning is expected to decrease by 1.184 points. The parameters σ^2 intercept=0.288 (p<.001) and σ^2 slope=0.036 (p<.001) represents the variances of the intercept and slope across trainees respectively. Finally,

the estimated covariance or cov(intercept, slope)=-0.118 which implies that there is a negative covariance between the intercept and slope. which implies that the higher the starting experienced Practical Relevance of School Learning, the weaker the increase in experienced Practical Relevance of School Learning. Gender and age significantly negatively influenced the intercept, indicating initial differences in the Practical Relevance of School Learning based on these two variables. Male trainees experienced lower Practical Relevance of School Learning at the beginning of the training (T0) compared to female trainees. This is indicated by the significant negative regression coefficient for gender (-0.169, p = 0.030), suggesting that male trainees' initial evaluations of the practical relevance of their school learning were less favorable than those of their female counterparts. Additionally, Older trainees evaluated the Practical Relevance of School Learning at T0 lower than younger trainees. This is shown by the significant negative regression coefficient for age (-0.040, p = 0.035), indicating that as the training entrance age of trainees increased, their initial perception of the practical relevance of their school learning decreased. Digitalization level had a significant negative impact on the slope (s), suggesting that higher digitalization is associated with a slower decline in Practical Relevance of School Learning over time. TVPs Expected grades and satisfaction with compensatory Corona measures showed significant effects on the observed values of Practical Relevance of School Learning at various time points, highlighting the dynamic interplay between trainees' expectations, their experiences during the pandemic, and their perceptions of school-workplace cooperation. Trainees' satisfaction with compensatory measures during the pandemic positively influences their evaluations of Practical Relevance at T1 and T2. The effect of expected grades is interesting. Initially, higher expected grades are associated with lower perceived relevance, but this relationship reverses by T2.

Concerning the second dimension of trainees' experience of school-workplace cooperation, the estimate of Intercept has significant positive value (Estimate = 1.823, p < .001), indicating the initial status of integration of specialized knowledge. Slope also has significant positive value (Estimate = 1.015, p = .002), indicating a positive growth trend over time. Notably, the slope becomes positive after adding predictors, even though the raw means of Integration of Specialized Knowledge (M_T0=2.53, M_T1=2.52, M_T2=2.40) suggest a decrease. This change occurs because the added predictors might alter the variance structure in the model, affecting the estimation of the growth parameters. This indicates the necessity of considering that part of these residuals might be due to specific occurrences during that time, rather than attributing the variability around the best-fit line for trajectories at each time point solely to unexplained random errors. There is not a statistically significant variability in the initial levels of integration of specialized knowledge among the trainees (Estimate = 0.062, p = 0.244). This means most trainees started with similar levels of perceived integration. The significant slope variance (Estimate = 0.105, p = 0.001) indicates that some trainees experienced a steeper increase (or decrease) in perception of integration of specialized knowledge over time, while others had more gradual changes. This suggests individual differences in how trainees' perceptions of specialized knowledge integration evolved throughout the training period. The estimated covariance (Estimate = -0.041, p = 0.213) is not significant which implies that there is no significant covariance between the intercept and slope. Among all predictors,

only the effect of expected grades is significant, indicating a positive effect on trainees' perception of integration of specialized knowledge at T2.

The third dimension of school-workplace cooperation has significant intercept (Estimate = 2.744, $p < 0.001$) with significant intercept variance (Estimate = 0.190, $p = 0.001$, which indicates that trainees started with different levels of perception of transparency and organization of training at the beginning of the training. The slope is not significant (Estimate = -0.462, $p = 0.096$), whereas the slope variance of it is significant (Estimate = 0.065, $p = 0.034$). When the variance of the slope is significant but the slope itself is not, it suggests that while there is considerable variability in how individuals' scores change over time (i.e., the growth trajectories differ), on average, these changes may not be statistically significant. In other words, although there are differences in how trainees' experience of transparency and organization of training scores evolve over time, the average change across the entire sample may not be large enough to be considered significant. However, the fact that there is significant variability in these changes indicates that some individuals may experience substantial improvements or declines in experience of transparency and organization of training, while others may remain relatively stable. This finding underscores the importance of considering individual differences in growth trajectories rather than relying solely on average trends. It suggests that while the overall change in organizational learning may not be significant when looking at the entire group, there are still meaningful variations in how individuals' scores change over time, which should be taken into account in further analysis and interpretation. The covariance (Estimate=-0.001, $p = 0.978$) between intercept of slope is not significant, which means that the relationship between the initial levels of experience of transparency and organization of training and the rate of change is not significant.

5 Conclusion and Discussion

In this study, to examine how the organizational and pedagogical dimensions of subjective perception of school-workplace cooperation change throughout the entire training course across individual trainees, we analyzed these dimensions using a latent growth model (LGM). This approach allows us to track the growth trajectories of these dimensions over time and across trainees. We specifically investigated how time-invariant and time-varying factors influence trainees' perceptions of school-workplace cooperation at both the organizational and pedagogical levels throughout their vocational training. Time-invariant factors, such as baseline characteristics of trainees and training conditions, remain constant over time. In contrast, time-varying factors, such as changes in training conditions or personal circumstances, fluctuate during the training period. Our analysis aimed to uncover: 1. The growth trends in organizational and pedagogical dimensions of school-workplace cooperation across the training duration. 2. The effect of COVID-19 pandemic during the special time period. 3. The differential impact of time-invariant and time-varying predictors on these growth trends. 4 The unique contributions of these predictors in shaping the trainees' experiences and perceptions of cooperation between schools and workplaces. By examining these aspects, we gain a comprehensive understanding of how trainees' subjective perceptions evolve and the

factors that drive these changes, thereby providing valuable insights for enhancing the effectiveness of vocational training programs.

5.1 Growth Trajectories in Trainees' School-Workplace Cooperation Experiences

The analysis of trainees' experiences of school-workplace cooperation reveals notable differences across the dimensions of Practical Relevance of School Learning, Integration of Specialized Knowledge, and Transparency and Organization of Training, particularly in terms of their initial levels (intercepts), changes over time (slopes), and variability among trainees. Firstly, regarding the intercepts, trainees initially perceive the Practical Relevance of School Learning most positively (intercept = 3.551), followed by Transparency and Organization of Training (intercept = 2.744), and then Integration of Specialized Knowledge (intercept = 1.823). The significant variance in the intercepts for Practical Relevance of School Learning (0.288) and Transparency and Organization of Training (0.190) indicates substantial differences among trainees in their initial perceptions for these dimensions. In contrast, the variance in the intercept for Integration of Specialized Knowledge (0.062) is not significant, suggesting more uniform initial perceptions among trainees.

In terms of changes over time, the slope for Practical Relevance of School Learning is significantly negative (-1.184), indicating a decline in this perception throughout the training period. On the other hand, the slope for Integration of Specialized Knowledge is significantly positive (1.015), showing an improvement over time. The slope for Transparency and Organization of Training (-0.462) is not significant, indicating stability in perceptions over time. The significant variances in the slopes for Practical Relevance of School Learning (0.036) and Integration of Specialized Knowledge (0.105) highlight considerable differences among trainees in how their perceptions change over time. The variance in the slope for Transparency and Organization of Training (0.065) shows some variability but is less pronounced.

Furthermore, the correlation between intercept and slope differs across dimensions. For Practical Relevance of School Learning, the significant negative correlation (-0.118) suggests that trainees with higher initial perceptions tend to experience a faster decline. In contrast, there are no significant correlations between intercept and slope for Integration of Specialized Knowledge (-0.041) and Transparency and Organization of Training (-0.001), indicating that initial perceptions do not predict the rate of change in these dimensions.

Overall, these findings answered the research question about the growth of perception of school-workplace cooperation across both training years and individual trainees, and highlighted the distinct trajectories and variances of different dimensions of school-workplace cooperation. The decline in the practical relevance of school learning, the improvement in the integration of specialized knowledge, and the stability in the transparency and organization of training underscore the necessity of considering these dimensions separately rather than treating trainees' experiences of school-workplace cooperation as a uniform construct.

Trainees might start with high expectations about the practical relevance of their school learning, which could explain the high initial intercept. However, as they progress

through their training and face real-world challenges, they may find that the school knowledge cannot be immediately and directly used to deal with workplace demands, and they face the realities of the workplace, the disconnect between theory and practice can become more evident, leading to a decline (negative slope). The positive growth trend (positive slope) in the integration of specialized knowledge suggests that as trainees advance in their training, they gradually see how specialized knowledge fits into their practical work. As trainees progress, they typically gain a deeper understanding of how specialized knowledge indirectly supports their work. This cumulative learning effect can result in an improvement over time (positive slope). The lack of significant variance in the intercept for this dimension suggests that trainees generally start with similar levels of perceived integration, possibly due to a shared understanding of the relevance of specialized knowledge at the beginning of their training, reflecting a common baseline at a deeper pedagogical level. While both dimensions evaluate pedagogical cooperation, they exhibit distinct patterns of growth curves. It is logical that trainees, at the onset of training, possess varying levels of understanding regarding how school knowledge directly applies to workplace issues. However, they share a common level of deeper understanding about the implicit integration between them.

The decline in the Practical Relevance of School Learning may not necessarily be negative, especially when viewed in light of the concurrent increase in the perception of Integration of Specialized Knowledge. This suggests that as trainees progress, they may move away from expecting direct applicability of school learning to workplace tasks and instead develop a more nuanced understanding of how specialized knowledge indirectly supports their professional roles. To facilitate this transition more smoothly:

- Structured Sessions and Guidance: Training programs should incorporate mentorship-guided structured sessions, encouraging trainees to adopt a systematic approach to problem-solving and to apply abstract concepts to predict outcomes. These approaches help trainees adapt from school-based learning to workplace practice. To link practice back to theory, a reflective observation process is essential for transforming experiences into learning, allowing trainees to question the validity and usefulness of their experiences. Additionally, an abstract conceptualization process helps students understand general concepts by relating them to concrete experiences and reflective observation. This aligns with Kolb's Experiential Learning Theory, which emphasizes bridging the gap between theory and practice to improve students' comprehensive understanding through active experience and involvement (Pamungkas et al., 2019). The goal is to support trainees in shifting their focus from seeking immediate, tangible results to deeply integrating school-based knowledge with workplace skills, fostering a holistic and comprehensive understanding.
- Gradual Integration of Complexity: A Kolb-based training curriculum is designed to progressively introduce more complex, real-world tasks, illustrating how specialized knowledge becomes more relevant over time (Pamungkas et al., 2019). The progression follows Kolb's stages: from diverging (feeling and seeing) to assimilating (seeing and thinking), then to converging (thinking and doing), and finally to accommodating (feeling and doing). This approach helps trainees recognize the evolving nature of

their learning in the process of moving from simple tasks to more complex workplace challenges.

- Value of Long-Term Relevance: The integration of school-based knowledge and workplace skills is a long-term process. To maintain motivation, training programs should offer learning opportunities that trainees can immediately apply, while also emphasizing the cultivation of deeper, specialized knowledge that will prove invaluable later in their careers. From the beginning, educators and workplace supervisors should communicate the long-term value of specialized knowledge. Rather than focusing solely on immediate results, trainees should understand that the skills and knowledge they are acquiring will significantly contribute to their career development over time. The goal is to help trainees shift their expectations from short-term, tangible outcomes to appreciating the long-term benefits of their theoretical learning.

The dimension Transparency and Organization of Training involves the clarity, structure, and organizational aspects of the training program, including communication and procedural transparency. Organizational structures and communication policies tend to be stable and consistent throughout the training period, leading to stable perceptions over time (non-significant slope). Trainees might be unfamiliar with dual training system and have varied initial perceptions based on their prior experiences or individual expectations, which explains the significant variance in initial perceptions (intercept).

The stability in the perception of Transparency and Organization of Training suggests that these aspects of vocational training are well-maintained throughout the program. However, the variance in initial perceptions points to the need for clear communication at the outset to ensure all trainees understand the structure and expectations of the program.

- Clear Orientation Programs: Implementing robust orientation programs that provide detailed information about the structure, policies, and expectations of the training program can help standardize trainees' initial perceptions. This will help ensure that trainees start with a solid understanding of how the program is organized and what is expected of them.
- Maintaining Organizational Standards: The consistency in perceptions of transparency and organization reflects strong organizational practices. Vocational training programs should continue to uphold these standards while ensuring that any changes or updates are clearly communicated to trainees.

The findings reflect the complex and dynamic nature of trainees' experiences with school-workplace cooperation. The decline in the perceived practical relevance of school learning, the improvement in the integration of specialized knowledge, and the stability in transparency and organization of training highlight the importance of addressing these dimensions separately. Practical Relevance of School Learning is dynamic and context-dependent, Integration of Specialized Knowledge benefits from cumulative learning and application, and Transparency and Organization of Training tends to be stable due to standardized organizational practices.

5.2 Effects of TIVs

We find Gender Effect and Age Effect on the initial level of the perception of practical relevance of school learning. These results highlight important demographic influences on trainees' initial perceptions of the practical relevance of their school learning. Gender and age were significant factors, with male and older trainees starting with a less favorable view of the practical relevance of their education. Older trainees may have had more opportunities to be exposed to different workplace environments before their entrance into their actual training program. Consequently, they may have a clearer understanding of how theoretical concepts translate into practical skills based on their prior experiences. Gender effect regarding work roles and responsibilities may shape perceptions of practical relevance. For example, males may perceive their education as more relevant if it aligns with perceptions of hands-on skills required in technical settings, while females may prioritize aspects such as communication or organizational skills that are traditionally associated with administrative roles (Anker, 2001; Barbezat, 2003). Furthermore, the occupation industrial management assistants has seen higher representation of females (BIBB, 2020; 2021; 2022), female trainees may perceive their school-learning as more directly applicable to the workplace.

Educational level influences trainees' perception of the Transparency and Organization of Training (one sub-dimension of trainees' experiences of school-workplace cooperation) with a positive intercept and a negative slope due to several factors. Trainees with higher prior educational levels (such as "Fachhochschulreife" (enabling advanced technical college studies) and "allgemeine Hochschulreife" (allowing university studies)) may begin their training with a stronger foundation in organizational and structural understanding. This initial preparedness can lead to a higher initial perception of transparency and organization in their training. Additionally, higher prior educational levels often come with higher standards for organizational practices. Trainees with such backgrounds might initially perceive the training structure as more transparent and well-organized because it aligns with prior experiences. Over time, trainees with higher educational levels might develop a more critical perspective and start noticing inconsistencies or areas for improvement that were not apparent initially. This growing awareness can lead to a decline in their perception of transparency and organization. Furthermore, higher prior educational levels might enable trainees to handle more complex tasks and responsibilities. As they advance, the training might become more intricate, and the organizational aspects might seem less transparent and more challenging to navigate, causing a negative slope in their perception. However, this assumption whether trainees handle more complex tasks and responsibilities should be tested based on the concurrent competence during their training, rather than solely prior educational level.

These findings concerning the significant influence of gender, age and prior educational level on how trainees perceive the school-workplace cooperation highlight the importance of programs offering flexible, personalized learning paths and regular feedback and adjustment to help keep trainees engaged and aware of the trajectory of their learning.

- Addressing Gendered and Occupational Perceptions: Gender sensitivity measures in educational sectors, aimed at imparting knowledge about structural gender inequalities and fostering collaboration to reduce them, are gaining increasing attention (see Steinweg et al., 2023). To promote gender equity and balanced skill development in VET, it is essential to incorporate gender-sensitive strategies from macro to micro levels. Introducing both male and female mentors who have successfully navigated industrial management roles can demonstrate the importance of both technical and organizational skills for career success, while also helping to balance gendered perceptions of school-based learning. Alongside this, gender-sensitive assessment criteria should be implemented. Diversifying the assessment framework to account for traditionally gendered skillsets ensures that both male and female trainees feel their strengths are acknowledged. Additionally, regular gender sensitivity training for staff help foster a more inclusive environment where trainees, regardless of gender, feel supported in their development and empowered to succeed.
- Gender and Age-Specific Interventions: Not all trainees transition smoothly from valuing the immediate applicability of school learning to appreciating the deeper integration of specialized knowledge. To address these differences, early-stage interventions that cater to the specific needs of male and female trainees, as well as younger and older participants, are essential.
- Workshops that emphasize both soft and hard skills can be instrumental in balancing gendered perceptions of relevant knowledge. For instance, showcasing the importance of soft skills like communication alongside technical expertise in various workplace settings helps trainees understand that both are crucial for success. This approach allows male trainees to value soft skills and female trainees to recognize the importance of technical skills, fostering a more holistic view of workplace competencies. Customized onboarding programs for older trainees to link theoretical concepts to the trainees' prior experiences can effectively help bridge the gap between previous knowledge and current training.
- International VET programs provide examples of personalized, need-oriented initiatives that address gender and age-specific requirements. Programs that focus on gender-sensitive measures, such as those highlighted by Dietz et al. (2021), offer concrete strategies for analyzing and addressing gender-specific needs while providing context-specific support. These tailored interventions into vocational education and training can help ensure that all trainees, regardless of gender or age, receive the support they need to navigate their learning journey successfully by acknowledging the diverse needs of trainees.
- Adapting Training for Different Educational Backgrounds: Training programs should be adapted to maintain engagement and satisfaction across different educational levels. From the outset, providing clear and comprehensive explanations of the training structure can help align expectations. As the program continues, regular feedback opportunities allow trainers to assess how trainees' perceptions evolve, ensuring that any misalignment in expectations can be addressed before dissatisfaction sets in. Additionally, incorporating more advanced organizational and project management training can offer these trainees practical applications for their higher expectations, keeping them engaged by providing leadership oppor-

tunities within the training context. By continuously monitoring perceptions and adjusting the organizational approach to better meet the expectations of trainees with advanced educational backgrounds, the training can remain responsive and supportive, ensuring that all participants feel their needs are addressed throughout the program.

Another important finding is that the level of digitalization significantly and positively influences the growth rate of trainees' perception of the practical relevance of school learning. However, the other two dimensions of experienced school-workplace cooperation were not statistically influenced by this factor. This may be because the integration of specialized knowledge depends more on curriculum measures than on infrastructure such as digitalization. Teachers and trainers with higher media-didactic competence are better equipped to leverage digital tools based on various didactic concepts and learning situation goals (Ma & Winther, 2024). The dimension of transparency and organization of training depends more on policies and strategies and is relatively stable, rather than being influenced by the level of digitalization.

The findings indicate that digitalization positively impacts trainees' perceptions of the practical relevance of school learning but does not significantly influence the deeper integration between school-based knowledge and workplace-based practice. This suggests that the deeper integration may be more closely tied to the media-didactic competence of teachers and trainers, who are responsible for effectively using digital tools. Therefore, training programs should prioritize developing media-didactic competence in educators and incorporating more digital tools and platforms into the curriculum to enhance both learning and workplace preparedness.

- Professional Development for Educators: Offer professional development programs aimed at building media-didactic skills, enabling teachers and trainers to effectively integrate digital tools that connect theoretical knowledge to real-world applications. These programs should cover digital pedagogy, the use of simulations, interactive learning platforms, and digital collaboration tools to create more engaging and relevant learning experiences.
- Incorporating Digital Platforms into Curriculum and Work-Based Learning: Expand the use of digital tools that allow trainees to collaborate virtually, analyze real-time data, and participate in digital simulations that mirror workplace challenges. This not only enhances the perception of school-workplace cooperation but also equips trainees with the skills needed for an increasingly digitalized work environment. Educators should incorporate media-didactic practices into their daily teaching routines to strengthen the integration of digital tools in both theoretical and practical learning contexts.

5.3 Effects of TVPs

The expected grade in the TVP has a reversed effect on the perceived Practical Relevance of School Learning during the final stage of training. In the initial and middle stages, in line with assumptions and previous research findings, trainees with higher expected

grades may believe that the knowledge acquired in school can be directly applied to meet workplace requirements, and this belief leads them to evaluate this aspect more critically (Berger, 1999; Wenner, 2022), resulting in a decline. However, in the final stage, there is a shift in perspective towards a deeper understanding of theoretical concepts and their broader implications in the workplace. This change in mindset prompts a reassessment of the perceived Practical Relevance of School Learning, leading to the reversed effect on the TVP expected grade. This interpretation is further supported by the significant positive impact of the expected grade predictor on the Integration of Specialized Knowledge at T1, indicating that trainees expecting better grades tend to focus on deeper integration rather than immediate application.

This reversed effect of trainees' expected grade also serves to highlight the existence of a long-term effect. To address this, monitoring trainees' performance expectations can provide valuable insights into their perception of school-workplace cooperation. By regularly assessing these expectations through check-ins, performance reviews, and reflective sessions, educators can tailor the curriculum to better support trainees' evolving needs. For those with high expectations, curricula should be designed to enhance deeper pedagogical cooperation, providing them with challenging tasks that align with their high performance goals. For trainees with lower expectations, the curriculum should focus on offering additional support to help them overcome difficulties and foster greater engagement with school-workplace integration. Ultimately, being sensitive to trainees' performance expectations allows educators to adjust the curriculum dynamically, ensuring that school-workplace cooperation is reinforced and trainees are fully supported in their development, regardless of their initial expectations.

The other TVP, corona measures, also has limited effect on the contemporary perception of school-workplace cooperation. The dimension "Integration of Specialized Knowledge," which is assumed to be more dependent on curriculum and didactic factors, and the dimension "Transparency and Organization of Training," which perhaps involve more stable policies and strategies, were statistically not influenced by corona measures.

The limited impact of pandemic-related measures on school-workplace cooperation, particularly in the dimensions of "Integration of Specialized Knowledge" and "Transparency and Organization of Training," suggests that disruptions caused by the pandemic did not significantly affect curriculum-based or policy-driven aspects of training. This finding implies that temporary external factors, such as the pandemic, can be buffered through robust curricula and policies, ensuring continuity in the integration of specialized knowledge and the organization of training processes. This was especially true during the pandemic crisis, where there was strong commitment from both teachers and students, as well as the training companies, to continue learning processes digitally in order to safeguard trainees' progress toward their vocational qualifications (Maier, 2020).

5.4 Study Limitations and Future Research

It is important to note that in this study, we based our findings on prior research and included only a limited scope of predictors. The variability of experienced school-workplace

cooperation might be influenced by various factors such as individual characteristics (e.g., age, gender), contextual factors (e.g., digitalization level, pandemic-related measures), and possibly other unmeasured variables. For example, the growth in perceived integration of specialized knowledge may result from better curriculum alignment, improved teaching methods, or increased opportunities to apply specialized knowledge in the workplace. Investigating the dimension of transparency and organization of training should consider more macro-level factors such as cooperation and communication strategies and policy. This also raises the question of whether trainees can accurately perceive and evaluate these factors.

In conclusion, this study confirmed the various subdimensions of trainees' experiences in school-workplace cooperation, highlighting their diverse growth dynamics and the varying perceptions among individual trainees. Further research is required to develop predictive models across different levels, from micro to macro, in order to identify and understand these factors. This knowledge can then be used to customize interventions and support to effectively address the unique needs of each trainee. Several key directions for future research can be derived from these findings, including but not limited to:

1. Causality Instead of Correlation: While this study identifies correlations between trainees' perceptions of school-workplace cooperation and TVPs, future research should focus on determining whether a causal relationship exists. For example, the positive relationship between desired grades and the perception of Integration of Specialized Knowledge raises the question of whether ambitious trainees perceive deeper school-workplace cooperation at a pedagogical level—potentially due to psychological factors such as goal-oriented attention—or if the perception of greater integration of specialized knowledge enhances trainees' self-confidence and ambition. Understanding causality would provide more actionable insights for educational program design and curriculum development.
2. Using School-Workplace Cooperation as Predictors for Training Outcomes: In this study, we used TIPs and TVPs to explain the perception of different dimensions of school-workplace cooperation. Future studies could explore the potential of school-workplace cooperation as a predictor for broader training outcomes, such as long-term career success or satisfaction. By analyzing how cooperation between educational institutions and workplaces influences these outcomes, researchers can gain deeper insights into the long-term benefits of strong school-workplace integration.
3. Analyzing the Effect of Concrete School-Workplace Cooperation Strategies: In this study, although we distinguished between three dimensions of school-workplace cooperation, further research should investigate the specific strategies used to enhance school-workplace cooperation and their effectiveness in improving both practical skills and theoretical knowledge integration. By analyzing different cooperation models (e.g., digital learning platforms, mentoring programs, project-based learning), researchers can identify best practices that contribute to more effective training programs. This could lead to more targeted interventions that ensure a stronger and more seamless connection between school-based education and workplace demands.

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Appendix

Table A1: Sample Characteristics

Aspect	Coding	Frequency	Percentage	Valid Percentage	Cumulated Percentage
Gender n = 455	Female	291	63.5	64	64
	Male	164	35.8	36	100
Educational Level (highest school leaving certificate) n = 456	Below Secondary school (e.g. Hauptschulabschluss)	1	0.2	0.2	0.2
	Secondary school certificate (Mittlere Reife)	91	19.9	20.0	20.2
	Advanced technical college (Fachhochschulreife)	133	29.0	29.2	49.3
	General higher education certificate (allgemeine Hochschulreife/Abitur)	231	50.4	50.7	100
Expected Grade n =602	1.0 – 1.5	116	25.3	26.2	26.2
	1.6 – 2.0	237	51.7	53.6	79.9
	2.1 – 2.5	81	17.7	18.3	98.2
	2.6 – 3.0	7	1.5	1.6	99.8
	3.1 – 3.5	1	0.2	0.2	100
Language(s) (spoken at home) n = 453	Only German	344	75.1	75.9	75.9
	More than German	101	22.1	22.3	98.2
	Only other than German	8	1.7	1.8	100
Company Size (Number of employees) n = 438	1 – 5	2	0.4	0.5	0.5
	6 – 10	2	0.4	0.5	0.9
	11 – 20	9	2.0	2.1	3.0
	21 – 50	30	6.6	6.8	9.8
	51 – 100	49	10.7	11.2	21.0
	101 – 250	95	20.7	21.7	42.7
	251 – 500	105	22.9	24.0	66.7
	501 – 1000	68	14.8	15.5	82.2
	> 1000	78	17.0	17.8	100

Aspect	Coding	Frequency	Percentage	Valid Percentage	Cumulated Percentage
City Size (location of company) n=431	Large city with a population of 100.000 or more	67	14.6	15.5	15.5
	Medium-sized city with a population between 20.000 and 100.000	181	39.5	42.0	57.5
	Small town with a population under 20.000	183	40.0	42.5	100

Table A2: Scale Statistics

Scale	Time point	Item Number	Cronbachs Alpha	M	SD
Practical Relevance of School Learning	T0	4	0.736	2.51	0.73
	T1	4	0.723	2.06	0.69
	T2	4	0.788	1.83	0.76
	T0	3	0.794	2.53	0.74
	T1	3	0.661	2.51	0.80
	T2	3	0.689	2.40	0.82
Transparency and Organization of Training	T0	3	0.636	2.40	0.80
	T1	3	0.689	2.23	0.84
	T2	3	0.671	2.13	0.87
Digitalization	T0	3	0.716	0.93	0.95
Corona Measures	T0	1		2.55	1.06
	T1	1		2.62	1.14
Expected Grade	T0	1		0.96	0.73
	T1	1		1.07	0.89
	T2	1		1.20	0.95

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Between Selection and Inclusion in Vocational Education and Training

Contrasting Switzerland and Spain

Fernando Marhuenda-Fluixá & Lorenzo Bonoli

Abstract *This article discusses inclusivness of Vocational Education and Training (VET) at Upper Secondary Education (USE). While inclusion has become a policy aim in compulsory education, it is not so clear that it is the case beyond post-16 education. In the case of VET, the demand of high quality standardized vocational qualifications challenges inclusion. The article addresses three different dimensions of inclusion: access to VET at USE, successfully achieving a qualification, and entering the labor market in a position according to the qualification achieved. We approach inclusion from a policy rather than a pedagogical perspective in section 2, and in section 3 our hypothesis about the inclusiveness of a school-based VET and a dual VET system are presented. In section 4 we choose Spain and Switzerland as examples of these systems, we show indicators, and we describe how both systems deal with the three dimensions of accessing, achieving a qualification and entering the labor market. The analysis concludes by stating that inclusion is particularly difficult because of the first dimension: it is in transition to VET in USE where both countries have more difficulties and could improve their inclusiveness. The problem is the same, but the reasons are different and these are explained in the text, addressing tensions between reputation and inclusiveness and the externalization of measures. Some considerations on comparative education also result from our analysis.*

Title *Between selection and inclusion in Vocational Education and Training: Contrasting Switzerland and Spain*

Keywords *Vocational education, inclusion, upper secondary education, Switzerland, Spain*

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1 Introduction

Vocational education and training (VET) has faced a number of challenges worldwide in recent years. In addition to its central task of training qualified workforce for national economies it has to contend with: First, the drift to a knowledge economy, which is leading to a profound change in the nature of professions, with a shift from industrial to service occupations; second, the trend towards digitalization, which is impacting the way work is done, upon labor relations, upon the content of work and occupations, some of which are in danger of disappearing while others are not yet foreseeable; third, the need to improve sustainability, which is recognized not only and not mainly by an aware and resisting citizenship but also by the scientific evidence of climate change and therefore the need to rethink ways of production, consumption and pollution; and fourth, the growing awareness of the importance of inclusive education systems, to which VET is called upon to make a decisive contribution.

Some authors have already pointed to the problems that collective skill formation systems face in the knowledge economy (Bonoli & Emmenegger, 2022), the first challenge we have mentioned. The second and third challenges, digitalization and sustainability, are addressed in recent years in a wide range of publications of policy and academic literature on VET (Anselmann et al. 2022; McGrath et al., 2019).

In this paper, we want to focus on the fourth challenge, inclusion, which is both underdeveloped and underestimated. Inclusion has only recently become a central issue in debates on public education, which has led several countries to adopt measures to extend and increase participation in Upper Secondary Education (USE) to all young people in the reference age group[1].

Inclusion issues have been subject of numerous studies in compulsory education, and its importance is growing in international debates on the reform of education systems especially at the USE level. While in policy studies inclusion in VET has only received little and recent attention (Bonoli & Emmenegger, 2022; Gamboa et al., 2024); research on transition pathways and pedagogical measures have tackled it at various levels (Duc & Kammermann, 2024; Friese, 2017; Kammermann, 2008, 2009; Marhuenda-Fluixá, 2006a, 2006b, 2009; Martínez, 1998; Molpeceres, 2004; Stolz & Gonon, 2012).

The issue of inclusion concerns the entire range of programs offered by an education system. However, VET, more than academic programs, has gradually come to be seen as the appropriate stream to provide qualifications at USE level for a wide range of young people who would normally have difficulty entering a program after compulsory school, and particularly for young people with low academic records or young people with migratory background.

It is therefore at the heart of the debate on the inclusiveness of education systems and in the center of our article. The question is hence: How can VET ensure inclusion of all profiles of young people in its programs at USE level? The challenge is particularly complex today, insofar as VET systems are expected to impart not only skills that can

1 Promoting larger access to USE indicates a trend in Europe towards making USE universal, if not compulsory as it is already the case in some countries: https://fra.europa.eu/en/publication/2017/mapping-minimum-age-requirements-concerning-rights-child-eu/compulsory-schooling

be used directly in a vocational context, but also those skills that are needed to continue training at a later level.

International statistics clearly show that people with a vocational USE qualification are more likely to enter the world of work quickly and to stay there than their peers without such a qualification[2]. Likewise, the economic prospects indicate that more qualified workforce will be needed in the future. At the same time, governments are beginning to consider investing in measures to increase, broaden and facilitate access to VET, especially for young people who are considered "vulnerable", because of "low educational performance, social background, low level of cognitive skills and other challenges" (Bonoli & Wilson, 2019, p. 8).The damage to people's lives and the costs caused by the possible exclusion that threatens people without a USE diploma are much greater, especially in terms of unemployment insurance and social assistance.

Nevertheless, the demand of inclusion challenges the ways that USE functions in every country. The design, structure and frame of USE were established in the 19th century as educational provision with limited access, for an elite. Selection was originally based upon a combination of social origin and individual capacities (Bonoli, 2021; Merino, 2023). Despite the massification of USE in the second half of the 20th century, its structures still contain selective features difficult to reconcile with policies aiming at widening access to all types of audiences. The ongoing discussions surrounding the criteria for accessing general education schools at USE (grammar schools) or the selection of the most qualified candidates by companies in the context of dual apprenticeship in Switzerland serve as illustrative examples of this phenomenon (Hafner et al., 2022; Imdorf, 2018). Meanwhile, the generalization of upper secondary education and training comes with the demand of a higher level of qualification of the workforce. At the individual level, this demand turns into a further requirement in order to successfully enter a recognized position in the world of work and hence in society. Therefore, the elites have been able to reposition themselves and USE is still nowadays recreating patterns of reproduction of social inequalities that used to take place at LSE in the past, as Verdier (2001) has shown for France.

In parallel, if the right to education for all becomes part of the policy aims of USE, a major challenge is adopting pedagogical measures to ensure the completion of the program and to avoid the risk of early school leaving, particularly for those for whom compulsory education was already enough and for those whose schooling was abrupt or interrupted (Duc & Kammermann, 2024; Palomares-Montero & Marhuenda-Fluixá, 2024; Scharnhorst & Kammermann, 2020). Another question is whether a more inclusive education system guarantees a more inclusive society, and particularly a more inclusive labor market. It cannot be overlooked that these two systems, education and production, have different logics.

Our article analyses these issues by looking at Spain and Switzerland, which are faced with the challenges of inclusiveness and selectivity in their education systems, and which are responding in different ways due to their different VET models, that we can broadly refer to as the *Spanish school-led system* and the *Swiss dual system*.

2 Cf. among other data set: CEDEFOP 2020, indicators 24 and 25 ("Employment premium for Initial VET graduates").

In other words, we are going to explore the question of inclusiveness by analyzing the case of two countries, Switzerland and Spain, which offer two particularly interesting cases for reflection on the issues inherent to inclusion. On the one hand, the two countries have different VET systems, the former being organized predominantly on a dual basis, the latter predominantly on a school-based basis. Moreover, international statistical indicators also highlight major differences, particularly in terms of youth unemployment, early school leaving and the attainment of upper secondary qualifications, suggesting that the Swiss system could be more inclusive than the Spanish system. However, a more detailed analysis of how the two systems work allows us to nuance this initial interpretation and show how the two countries are both confronted with problems of inclusiveness, even though these manifest themselves at different levels and the two countries react to them with different measures.

It is important to specify that our perspective is institutional. We focus on the organization of the education system, with particular attention to VET, in order to highlight the structures, dynamics and logics that characterize its functioning and underpin the decision-making process in the field. Our article will not, for this reason, go deeply into the more specifically pedagogical aspects of inclusion, particularly in relation to the functioning or effectiveness of any specific measures adopted (Duc & Kammermann, 2024; Palomares-Montero & Marhuenda-Fluixá, 2024; Scharnhorst & Kammermann, 2020).

After clarifying the notion of inclusion and specifying three key moments affecting it (access to USE, achieving a USE qualification, access into the labor market or to further education), we present several international indicators that can help us compare the two countries and situate them in relation to the European average. This will be followed by a more detailed examination of the situation in each country to give a more accurate picture. Our conclusion allows us to return to the most important aspects of our analysis; particularly, how difficult it is to state that one of the two models is more or less inclusive or selective. It is clear that the Spanish and the Swiss models are confronted to different degrees and at different moments by the challenges of inclusion and selection, applying *filtering mechanisms* which help ensuring the smooth running of the system and safeguard its reputation: Gatekeeping seems to be stronger than facilitating access.

By considering the situation in Spain and Switzerland, our article adopts a comparative approach, with all the problems that comparisons entail in the field of VET (Evans, 2020; Georg, 1997, 2005; Grollmann et al., 2022; Li & Pilz, 2021; Pilz, 2012; Pilz & Li, 2020; Renold, 2020). At the international level, VET is characterized by great diversity (Billet, 2011; Renold, 2020) and the difficulty of finding universal concepts and of establishing appropriate criteria for comparison. As Ursula Renold (2020) points out, "it is difficult to define VET programs or VET systems as a transnational category. These systems are too different with regard to the social constructs of concepts and are most likely founded on different political economy concepts" (p. 33). To get around this problem, it is essential to "reduce the complexity of VET" and to try to develop "transnational concepts so that comparisons have a valid basis" (p. 33). These transnational concepts can be developed by identifying what Dubar et al. (2003) call "common problems" – problems, stakes, questions "with which all members and institutions would be confronted and which, historically, would have given rise to different answers according to the diverse and contingent configuration of the actors involved" (p. 61). In the following pages, therefore, we will fo-

cus on the general problem of inclusion as an issue faced by both countries. This problem will be analyzed at three different levels, raising challenges that, although contextually different, pave the way for a comparative analysis. A comparative analysis that, given the limits of the comparative exercise and the methodological choice of "reducing complexity", does not necessarily insist on the similarities that would emerge from the choice of this "common problem", but rather on the differences between the two countries that this perspective allows us to grasp better. With the words of Dietmar Frommberger (2004): "In this more limited context, comparing does not mean assuming or establishing similarity; instead, comparing means understanding, acknowledging, and accepting difference and not insisting on generally applicable conclusions" (p. 15).

2 Defining Inclusion

The European Commission tends to speak of inclusion as social inclusion and to link it to poverty and risk of poverty and a limited participation in social and cultural life; however, when defining it, education is not considered relevant to the issue[3]. When it comes to young people, social inclusion is addressed within youth policies (including housing, health, social and financial services), VET, if mentioned, is only a side dimension to it, not the central one. Inclusion is a social issue, not an education or qualification one.

The recently published terminology of VET (European Centre for the Development of Vocational Training , 2024) characterizes inclusion with adjectives like digital and social; related to equity. Inclusive education and training is defined as:

> Learning which ensures equal access and successful participation of all citizens – including those from disadvantaged groups – to promote their social and occupational inclusion […]. An inclusive education and training system requires appropriate structures and activities: learning opportunities (compensatory learning, special needs education, second chance education); incentives and human / financial resources; support (lifelong guidance, personalized learning) (European Centre for the Development of Vocational Training, 2024, p. 194).

Related terms in the same CEDEFOP volume are 'career guidance practitioner / career practitioner, compensatory learning, disadvantaged group / vulnerable group / group at risk, lifelong guidance, lifelong guidance system, social inclusion, social integration, second chance education, special needs education, vocational integration / occupational integration' (European Centre for the Development of Vocational Training, 2024, p. 194).

For the purposes of this article, we define inclusiveness as the capacity of a VET system to include the largest possible number of people into quality education or training provision at USE level and inclusion as the result of this capacity. By quality education we understand one that is conducive to an officially recognized qualification free of any stigmatization and with good value in the labor market.

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3 Cf. National policies plateforme: https://national-policies.eacea.ec.europa.eu/youthwiki/policy-fields/4-social-inclusion

Therefore, the inclusiveness of a system can be assessed by considering at least 3 aspects. First, in terms of access to USE, an inclusive system is able to provide VET for all young people, regardless of their conditions of vulnerability and marginalization (United Nations Educational, Scientific and Cultural Organization , 2005), and it presents conditions of access to various training courses that do not discriminate, create or prolong social inequalities. What is at stake here is the transition from LSE into USE, namely Transition 1 (T1). Second, an inclusive system must ensure that a relatively large number of young people successfully complete their training and attain a diploma while providing alternative transition solutions for those who cannot complete the ordinary ones. Third, an inclusive system is also one that offers diplomas that open good prospects for professional and social integration into adult life. What is at stake here is the Transition 2 (T2), the transition to the world of work or to further education or training (Chester, 2024; Raffe, 2013).

Our perspective on inclusion is thus close with the political sciences perspective, which draw its attention particularly on the balance between social and economic aims of education policies (Bonoli & Emmenegger, 2020; Gamboa et al., 2024), and on issues like stratification and selection, codependence and/or state intrusiveness (Durazzi & Geyer, 2022). VET, in its traditional understanding, aims at preparing young people for the world of work and therefore reflects inevitably the competitive and selective feature of the labor market. In contrast to academic USE, which is a continuation of the LSE school logic and aims to pave the way for entry into academic higher education, VET is positioned at the crossroads of the educational and productive systems, it is an educational offer that is traditionally aimed to prepare young people to leave the educational system rather than to continue in it directly . Until recently, it was intended to bridge education and work. Nowadays, in most countries, it has also become a gate for further and higher (vocational) education. For this reason, we can say that the challenges for VET are particularly complex: VET must satisfy both the internal objectives of the education system and the external demands of the labor market, while academic education is free from this double demand and pressure (Gonon, 2014).

We can then rephrase our question into the extent to which a VET system can maintain and foster inclusion before the demands of the labor market, while at the same time offering programs that integrate certain people or groups of people that the labor market might be ready to discriminate.

3 How Well Prepared is VET at USE to Achieve Inclusion? Should we Expect Differences Between Dual and School-Based Systems?

In recent years, public education policies have focused on VET both for economic reasons (to improve the skill levels of the national workforce) and for social reasons (to combat unemployment, particularly among young people, and to promote the broad inclusion of all sections of the population in USE-level training)[4]. From a political point of view, youth

4 Cf. the initiatives related to the European Vocational Skills week: https://vocational-skills.ec.europa.eu/

unemployment has become the most quoted indicator to evaluate the effectiveness of a system. This might also be considered as a sign of its potential of inclusiveness.

The resistance of countries such as Germany and Switzerland to the 2008 financial crisis placed their dual apprenticeship model at the center of international debates, portraying it as a miracle recipe that would not only provide skilled workers, but also help to control youth unemployment[5]. The dual model is often referred to as the best anti-youth unemployment measure that could be transferred from these to other countries to solve the problem of youth unemployment (Gessler, 2019; Jäger et al., 2016), and there have been important attempts to do so, as the topic of internationalization of (German or Swiss) dual VET indicates (Gessler et al., 2019; Jäger et al., 2016).

International data, like Eurostat , show a kind of correlation between a low level of youth unemployment and a higher share of dual VET. But these international data are difficult to interpret, and it is not easy to establish a direct causality between dual model and low youth unemployment. Many parameters influence this indicator: the general functioning of a state's economy, the length of compulsory education, the available structures for transitions school-to-work, or the supply of full-time school education at USE, among others.

The caution with which we must read these data is also justified by several studies which clearly show the selective nature of the dual model, which tends to exclude the vulnerable profiles from its programs (Hupka et al., 2010; Imdorf, 2009). Due to the large participation of companies, the dual model reflects the selective logic of the world of work, and it can only work properly if companies agree to participate and have a direct interest in the training of apprentices[6]. In practical terms, this means that companies need to have the possibility to choose their future apprentices among young people with strong profiles. This selection is one of the decisive elements that ensures that companies can make a profit from their investment of time and money in training an apprentice, as cost-benefit analysis indicate (Gehret et al., 2019).

The alternative model for offering VET at USE level is represented by school-based systems. This model may offer advantages in terms of the inclusiveness of the system, insofar as the conditions of access can be established by national education policy and facilitate access to such training even for young people who would not get an apprenticeship contract in dual systems. School-based VET systems may have proved more able to continue training at a time where apprenticeship vacancies were scarce, both in the 2008 crisis as well as in the 2019 one; that is clearly seen in Spain, where the offer of VET schools and enrolment of students grew during both crises, as limited or reduced activity in companies does not result in less training positions.

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5 Cf. the documentary "Le miracle suisse: la recette anti-chômage", made by France 2 in 2012, broadcast as part of the program "Un oeil sur la planète".

6 Here we see a kind of tension emerging between an economic rationale, which characterizes the economic expectations of companies, naturally looking for the most productive employees, and a pedagogical rationale, which promotes the work-based learning model as the ideal solution for young people with non-academic profiles. Managing this tension is by far one of the greatest challenges facing dual models of VET.

However, this model also has disadvantages compared to the dual model, including higher costs to society, insufficient or inappropriate practice-oriented teaching, a greater risk of a mismatch between the qualifications taught and the actual needs of the job market, with the corollary risk of having diplomas that are hardly recognized on the job market.

In this paper, we take a closer look at these two VET systems in relation to their inclusiveness potential, based on the three dimensions we mentioned earlier: T1, completion of VET at USE and T2. To focus our analysis, we will address mainly initial VET and some VET programs preparing for initial VET. VET at tertiary level is out of our scope.

The cases of Switzerland and Spain are ideal for such an analysis. Switzerland, with a long tradition of the dual model, is currently the European country with the highest rate of young people in this type of training and at the same time it is among the countries with the lowest youth unemployment rates. The Spanish VET system is quite different. It can be described as a *school-led system*, without being a fulltime-school system, since VET programs integrate also work-based learning. The Spanish VET has grown stronger in recent decades. However, Spain has one of the highest youth unemployment rates in Europe.

A first question is whether comparing these two systems enables us to identify specific characteristics of their inclusiveness. The question here is if one of the two models can be considered more inclusive than the other. While a definitive answer is hard to achieve, our analysis will enable us to highlight the different mechanisms and the advantages and disadvantages of both.

Our analysis will also lead to highlighting the key role played by companies in determining the inclusiveness of a VET system, whether in terms of the apprenticeship or traineeship positions offered for learners or in the provision of suitable jobs for VET graduates. In this perspective, a school-led system could result less selective then a dual-model, but that does not mean that the labor-market is also less selective and T2 can prove very difficult. On the opposite, T2 in dual-model systems is often considered as relatively smoother (Steedman, 2012).

Our analysis will show some differences but also some analogies between the two countries. The main finding of our analysis is that both systems, beyond their very different organization, are exposed to similar problems concerning T1. In both countries, we find a form of filtering which, ensures smooth running of the programs at USE on the one hand, with the side effect of more selection on the other. As we will see, in Switzerland, this filtering is achieved through the selection of apprentices by companies, a selection which is particularly discriminating young people from immigrant backgrounds or with poor school results. In Spain, the filtering is ensured by the diploma on compulsory secondary education, a prerequisite for accessing USE. The remainder of this article will provide a more detailed description of this filtering process and its role in both systems.

4 Spain and Switzerland: Significant Indicators

Even if the data available for comparing education systems are relatively limited, and when they exist must be taken with great caution (Rambla & Bartolini, 2023), we find

useful to refer to a series of indicators drawn up by CEDEFOP, Eurostat and OECD to try to describe the general situation in these two countries, and to position them in relation to international averages (Table 1).

Table 1: Choice of Indicators Spain – Switzerland

Indicator	Spain	Switzerland	International values
1. Population (2024) *	48 610 458	8 960 800	449 206 579 (EU27)
2. Pupils enrolled in USE (2022) *	1 897 577	349760	18 229 991 (EU27)
3. Proportion of USE pupils out of all young people aged between 15–19 in (2022) *	75.8 %	82.7 %	78.6 % (EU27)
4. VET students as % of all USE students in (2022) *	39.1 %	61.1 %	49.0 % (EU27)
5. Dual VET students as % of all VET students in (2022) *	2.6 %	90.8 %	24.6 % (EU27)
6. Initial VET students with direct access to tertiary education as % of all USE Initial VET (2021) **	58.0 %	92.6 %	71.7 % (EU27)
7. At least USE educational attainment, age group 20–24, (2023) *	79.0 %	88.3 %	84.1 % (EU27)
8. Early leavers from education and training (2021) **	13.3 %	4.9 %	9.8 % (EU27)
9. Unemployment rate for 20–34 years old (2022) **	17.2 %	5.0 %	8.5 % (EU27)
10. Employment rate for recent Initial VET graduates, age group 20–34, (2022) **	65.7 %	84.8 %	79.7 % (EU27)
11. Completed USE by theoretical duration plus two years. Total USE (2021) ***	81 %	91 %	82 % (OECD)
12. Completed USE by theoretical duration plus two years. Vocational track (2021) ***	63 %	90 %	73 % (OECD)

*Source: Eurostat online data base, (EU27). **Source: CEDEFOP online data "Key indicators on VET". ***Source: OECD 2023, Education at a Glance.

These indicators show at first the differences in the size of our two countries, Spain having more than 5 times as many inhabitants and people enrolled in USE than Switzerland. Then they show differences in the organization of USE: Switzerland has a higher share of young people attending USE programs, and a much higher share of learners in VET. The difference is even bigger if we consider the rate of learners in dual model VET (90.8 % against 2.6 %), a rate which confirms the different nature of the two systems: dual on one side and school-led on the other. These data show also that Switzerland has

a higher rate of Initial VET learners who have direct access to tertiary education than Spain, with a rate well below the EU average.

It is therefore worth considering the educational attainment in the age group 20–24,where Switzerland has a higher rate than Spain. At the same time, the rate of early leavers is higher in Spain than in Switzerland, as well as the unemployment rate (20–24). Data show also that after completing Initial VET, 84.8 % of the graduates in Switzerland are in employment, against 65.7 % in Spain. Finally, data on the duration of USE programs show a higher rate of learners succeeding in the theoretical duration plus two years in Switzerland than in Spain.

These data give us an initial picture of the situation in the two countries. However, it is extremely difficult to make general judgements about the functioning of a particular system solely on the basis of such indicators. And it is particularly difficult to deduce from these indicators how inclusive a system is. Switzerland scores better than Spain on several of these indicators, even though Spanish data are improving relatively fast since 2013[7]. But does this also mean that the Swiss system is more inclusive than the Spanish system? And that a system based on the dual model is more inclusive than a school-led one?

To answer our questions, we need to deepen our analysis and to go into the details of how the two systems work. This will allow us to grasp the nuances that are not apparent from these international indicators.

4.1 The Challenges of Inclusion for Spanish VET

4.1.1 Access to VET in USE

In Spain, T1 starts at the age of 16, when students can choose between the academic and the vocational path at USE. This choice is only for those who have achieved the General Certificate of Secondary Education (known as GESO, its Spanish acronym standing for *Graduado en Educación Secundaria Obligatoria*). This is a requirement without which no further education within formal education is possible, neither in the academic nor in the vocational pathway.

To facilitate achievement of that Certificate[8], a comprehensive LSE has developed five different pedagogical measures that most secondary schools adopt: 1) individual curricular adjustment; 2) curricular diversification; 3) basic VET, a vocational offer for those students older than 15 who have little prospects to achieve the GESO; 4) the so called PROA+ program[9], a nationally funded program for schools in very complex contexts, with the aim to facilitate the educational success of students with a vulnerable condition; and 5) guidance provided by secondary schools, often addressed to facilitate the continuation of their studies if they comply with the requirements.

Given that the entry requirements for academic and vocational paths are equal, most students and families choose to take the academic one, with the expectation of better

7 Cf. Eurostat data, 2013.

8 Spain has the highest repetition rate in LSE of all of Europe, 8,6% (Ministerio de Educación y Formación Profesional, 2023, 24)

9 Programa para la Orientación, Avance y Enriquecimiento Educativo, its full name in Spanish.

prospects. National and regional policies have been struggling to promote VET at the USE as this was a demand of the productive system, to have a workforce with more vocational qualifications (Merino, 2023).

Since the surge of the 2008 financial crisis, formal VET has improved its prestige and attractiveness. The VET offer at USE level has almost doubled in the past decade and the demand for VET is increasingly growing, resulting in students not being able to opt for the vocational qualifications of their choice and, as a side effect, for a rapidly growing business of private VET providers and schools, paradoxically when the country policies apparently go in the direction of more company involvement to provide practical dual training.

On the other side, young people without GESO cannot follow these standard transitions from LSE and USE. They have to go through "de-standardized" transitions outside the formal education system. For these groups three options are available: a) entering a non-qualified job, often under precarious and temporary conditions; b) becoming a young person neither in education nor in employment or training; or c) joining either an LSE program called Basic VET or one of the many non-formal VET programs.

In 2022, 13.9 % of Spanish youth were not able to proceed to USE[10] (Ministerio de Educación y Formación Profesional, 2023, p. 33) and were considered early school leavers from education and training[11]. These data show that LSE measures are not enough and do not achieve their aims although they have improved, as in 2012 this proportion was of 24.7 %. Official data are scarce and hard to interpret properly for the lack of sufficient information, and therefore we find discrepancies between those announced by Eurostat, official Spanish sources (Ministerio de Educación y Formación Profesional, 2023) and recent research relying on them (Salvà et al., 2024).

This applies to both formal and non-formal VET, where there is a wide offer which is, however, unstable, short-term, funded through a variety of mechanisms and run by diverse VET providers that make it impossible to register data of the offer, attendance and success. There are no official data for enrolment nor for offer in non-formal VET. This is, however, the only chance for all those young people that do not achieve the GESO and cannot therefore remain in the formal education system.

4.1.2 Achieving a Qualification

As stated above, the efforts taken at LSE to increase registration in VET at USE have proved effective, so that between 2012 and 2022 there have been clear improvements: in 2012 only 63 % of the population aged 20–24 had at least a USE (ISCED 3) according to Ministerio de Educación y Formación Profesional (2023, p. 26), these data had risen to 79 % in 2022, as shown in table 1.

As initial VET competes with academic USE, many opt to follow the academic path under family pressures, but they may realize to be unable to follow this route and may drop out, perhaps choosing a VET qualification at a later stage. Among those whose first

10 This and other data correspond to schoolyear 2022/2023. Source: https://www.educacionyfp.gob.es/dam/jcr:f36ffb54-2052-43d5-a0a2-e4d96b2a5b2f/datos-y-cifras-2022-2023-english.pdf

11 The percentage of the population aged 18 to 24 having attained at most LSE and not being involved in further education and training.

choice is VET, most attend it in a VET school near the family home. A single VET school does not usually offer a very wide range of qualifications, many schools have an offer of qualifications that demand low investment in machinery and infrastructure. Therefore, there are many students enrolled in a qualification that is not so appealing to them (Merino, 2023), which may have an impact on their motivation to complete the course.

Even though, there are no official data on students leaving a vocational qualification, specific studies show a considerable amount of dropout with huge variations according to regional and occupational differences, and among student profiles too: migration background is a clear factor of higher dropout and of not achieving the vocational qualification.

The most comprehensive and updated study on this issue identifies three main reasons (Salvà et al., 2024): individual and family features (educational and economic conditions, family support, low self-esteem, gender and nationality); the organization of education (low performance, lack of chances to study their first vocational choice, lack of guidance, no bond to teachers and too large groups) and labor market (hiring unqualified youth and low expectations to improve career prospects).

However, in another recent study, Gamboa et al. (2024) state that VET is more inclusive at USE than the academic pathway, given that the enrolment of potentially vulnerable people like migrants, people with disabilities, people in rural areas or women is higher. Anyhow, these authors are clear that basic and initial VET are inclusive, though that is not the case of VET at the tertiary level.

This inclusiveness of VET at USE can also be interpreted from a different view: Merino (2023) takes a sociological viewpoint to offer an explanation for this situation where certain social groups are overrepresented in comparison to the academic path at USE. Merino shows with data that there are many more students in VET at USE whose parents do not have an academic USE or tertiary diploma. Therefore, he speaks of a discriminatory effect of inclusion in VET, and he states that VET is still a USE choice considered for certain social groups, as if it would still be the choice to educate the working class.

4.1.3 Access to the Labor Market

Compared with data of the previous decades, T2 performs rather well; however, Spain still has room for improvement in international comparisons. In year 2022, unemployment rates of the population aged 25 to 34 (Ministerio de Educación y Formación Profesional, 2023, 37) were of 28.1 % for youth with primary or lower education, decreasing to 21 % for those with LSE and to 16.1 % for those with USE. In the case of tertiary education, the rate goes down to 10.2 %. The overall youth unemployment rate is still very high, 17.2 %[12]; though significantly lower than in 2012, when it was 53.2 %.

Youth unemployment has been and still is a huge problem in the country, particularly for those of migrant origin (Consejo Económico y Social, 2019). Diverse studies have detailed particular features such as overqualification and displacement of people with lower qualifications (Consejo Económico y Social, 2020), difficulties to enroll in lifelong learning (Montero, 2022), and precarization of the labor market (Comisiones Obreras,

12 Cf. Eurostat data, 2012.

2023). There have hardly been official longitudinal studies on transitions, and these have been interrupted so that they are outdated and relatively useless nowadays.

If we consider transition into tertiary VET after successfully completing VET at USE, the Ministry of Education and VET offers data on enrolment showing that between 2012 and 2022 access from VET at USE into tertiary VET has almost doubled. There are little doubts of the increased employability of tertiary VET graduates, but the labor market may still make greater efforts at several levels: According to Salvà, Moso and Quintana (2024), using data from 2017, one out of four employments in Spain are for tertiary VET (25.48 %), while only one out of seven for VET at USE (14.84 %). These data would explain why access to the labor market after VET at USE is so hard and scarce; while these data also provide a contrast to the complaint of companies about difficulties to find appropriately qualified workers, given that their offer is not that wide for VET qualified people, neither at tertiary nor at USE level: it is widely assumed that the workforce in the Spanish labor market faces too many overqualified and unqualified jobs, and there are not so many offers for VET qualified jobs.

There are however companies that care to provide VET qualifications, even if rather for lower than higher level. Efforts have been taken through three kinds of legal support for companies: a) Special Employment Centers hiring people with disabilities, qualified and unqualified, providing them training and support; b) Work Integration Enterprises, hiring vulnerable and low qualified people (young people unqualified, migrant origin, people who were in prison, had trouble with addictions, homelessness, etc.) with the aim to qualify them and equip them with a validly recognized vocational qualification within a timeframe of three years (Marhuenda-Fluixá et al., 2020); and c) Job Enclaves for people with disabilities (Salinas-Tomás & Marhuenda-Fluixá, 2020), who find training support in ordinary companies, though not aiming to any specific vocational qualification.

A related issue, anyhow, is whether these measures facilitate access to a non-dualized, non-fragmented, non-precarious labor market, and whether the training and support provided in such measures facilitates access to qualified or to low or non-qualified employment. We should bear in mind that inclusion in adult life is not only active participation in the labor market, but also in other domains of life.

This is particularly relevant because the labor market is characterized by strong unemployment rates and precarization, a trend only reversed through reforms initiated in 2019. The fact that several VET and employment initiatives have been promoted by the civil society indicates, on its side, that companies apart from those part of the social and solidarity economy are not interested in employing people with difficulties unless they get a reward under the form of subsidies. Training is still a missing value in entrepreneurial culture in Spain.

4.2 The Challenge of Inclusion for the Swiss VET

4.2.1 Access to VET in USE

In Switzerland, T1 raises several problems. Existing restrictions on the transition between LSE and USE create a filtering effect which leaves on the sidelines young people with lower educational performance or young people with a migratory background (Scharnhorst & Kammermann, 2020).

On the one hand, access to gymnasiums is limited to LSE leavers with the best grades. In some cantons, there is also a clear political will to restrict access to this type of training and to keep it below 20 % of young people in each cohort (Hafner et al., 2022).

On the other hand, access to VET does not depend on obtaining a LSE qualification or a certain grade. However, in practice, young people with poor LSE grades or without a LSE qualification find it more difficult to find an apprenticeship position (Imdorf 2007, 2016).

According to recent data, 21.7 % of young people do not make a direct transition from LSE to USE. 12.1 % are in a temporary solution waiting for a suitable apprenticeship position, which often takes at least a full year for most young people, sometimes even longer (Swiss Federal Statistical Office, 2024).

These data show that T1 is not easy in Switzerland. Many young people cannot follow the program they would like to, whether access to a Gymnasium or an apprenticeship they would like to do. The factors affecting this situation are restricted access to Gymnasiums; lack of control over the supply of apprenticeship positions; freedom of companies to offer apprenticeship positions and to choose apprentices; and limited alternative outside Gymnasium or apprenticeship (Hafner et al., 2022; Imdorf, 2007, 2016; Scharnhorst & Kammermann, 2020).

This situation creates very strong competition to enter academic USE or to find the best apprenticeship positions. This competitive situation puts specific social groups in difficulty with a clear discriminatory effect. This makes T1 particularly difficult for young people from disadvantaged social groups: young people with lower school grades; migration background; parents without USE diploma; and, for certain occupations, young women too. At the same time, the pressure is high on young people to accept second-choice solutions, running the risk to interrupt training before its conclusion (Lamamra & Masdonati, 2009).

These transition problems are relatively well known, and many measures have been put in place to try to solve them (better career guidance, temporary solutions, creation of a certificate with reduced requirements, etc.). However, most of the measures do not affect the selective nature of the dual system. Instead, they focus on better preparing vulnerable young people to succeed in the selection process, helping in this way to reduce the negative impact of the selectivity of dual apprenticeships. Bonoli and Wilson (2018) speak of "external measures" that try to improve the inclusiveness of the system, without touching its main characteristics (selective nature, autonomy of the companies), but trying to adapt or to better prepare young people to the existing conditions. This is particularly true if we consider the temporary solutions offered by most cantons for young people who are not enrolled in a USE program after the end of LSE. These temporary solutions, which are not integrated in the formal education system and do not lead to an official certificate, are mainly school-based and aim to help young people choose a future occupation, compensate for deficits in their school education and prepare them for job interviews so that they can successfully get an apprenticeship offer the following year (Scharnhorst & Kammermann, 2020). This VET policy means that the system does not have to take structural and far-reaching measures to improve its inclusiveness and, above all, companies are not obliged to change their practices and to increase their commitment to a more inclusive system (Bonoli & Emmenegger, 2020).

4.2.2 Achieving a Qualification

While T1 clearly represents the critical moment in the Swiss education system, the course of education leading up to the award of a degree is relatively positive. Longitudinal statistics show that 90 % of young people who entered USE in 2011 obtained a diploma within 5 years (Swiss Federal Statistical Office, 2018). If we look in more detail at the graduation rate for young people following a three-year initial VET program, we can see that 74 % obtained their diploma without any loss of years, 9 % did with a repetition year, and 5 % with a reorientation, interruption or after a first failure at the exams (Swiss Federal Statistical Office, 2018).

While these figures may seem positive, the relatively high rate of apprenticeship interruption should not be overlooked. Statistics from 2022 show that 23.5 % of young people starting an apprenticeship experience a break in their training (Swiss Federal Statistical Office, 2022). There are many reasons for these, from a bad choice of vocation on the part of the young person, who realizes that the chosen vocation is not for him or her, to problems with the company's trainers, which make it impossible to continue training (Kriesi et al., 2016). For a significant proportion of these young people, training is quickly resumed in another occupation or another company, but this period can also extend over several years.

Interruption of a training pathway is not per se a problem. It is perfectly normal and desirable to have the opportunity to change training pathways. It becomes a problem when the interruption rates become significant, revealing a problem both in terms of the choice and therefore the guidance that young people have received and in terms of support in the company, relating to apprenticeship conditions in companies, control on them as well as the preparation of trainers in the companies (Duc & Lamamra, 2022).

While an average interruption rate of 23.5 % is not considered alarming in Switzerland, as similar rates have also been recorded for general education courses (Kriesi et al., 2016), it is certainly worrying in certain occupations where the rate rises above 40 %, for example in occupations like caulker, plasterer/drywall builder or building cleaner, to name a few (Swiss Federal Statistical Office, 2022).

Despite these problems, the Swiss education system enables a high proportion of young people to obtain a diploma at USE level. Current Swiss statistics (Swiss Federal Statistical Office, 2024) show that 91 % of young people obtain a USE diploma before the age of 25, one of the highest rates at international level: Eurostat shows a rate of 88.3 % of educational attainment against a rate of 84 % for EU 27.

Obtaining a USE diploma before the age of 25 is the result of a strong commitment on the part of all players in the Swiss education system. Since 2006, the confederation and the cantons have stated their intention to achieve a graduation rate of 95 %, which is not yet the case. It is also interesting to note that this rate also points to a problem with the inclusiveness of the Swiss system. If we look at Swiss young people born in Switzerland, the rate is already 94 %, whereas the rate for those born abroad drops to 72 % (Swiss Federal Statistical Office, 2024). These figures clearly show that the Swiss system has difficulty integrating young people with migration background and enabling them to obtain a USE diploma.

4.2.3 Access to the Labor Market After Upper Secondary VET

If we look closely at the Swiss system, we can recognize that T2, between USE and tertiary education or the world of work, is working well, especially in international comparison. The good data at this level have contributed to the reputation of the Swiss system as a model that ensures an easy transition between the world of school and the world of work, and the Swiss society and politics are highly satisfied with this picture, even though the academic world is far more critical (e.g., Bonoli et al., 2018; Duc & Kammermann, 2024).

Data on youth unemployment provide initial indications of T2. More precise longitudinal data also show that 84 % of young people who obtained an initial VET diploma in 3 or 4 years are either in training or in employment within six months of obtaining their diploma. This rate rises to 92 % after 42 months, with only 2 % of young people registered as unemployed (Swiss Federal Statistical Office, 2018).

Although these data are particularly positive, especially at international level, we must be careful not to conclude that the Swiss system is highly inclusive. These data tend to hide the high level of selectivity at T1, the consequence of which can be seen in the difficulty vulnerable young people have in making that transition. The dual system can work well only if companies can play their chances and look for competitive profiles (Muehlemann & Wolter, 2014). Of course this leads inevitably to the exclusion of less competitive profiles.

Based on these elements, we can state that, the dual model does not appear to be a particularly suitable tool for inclusion, since it tends to exclude vulnerable young people, as they are considered less "suitable" (Muehlemann & Wolter, 2014) by the companies. But we must also consider that this exclusion of vulnerable profiles has a, so to say, "positive effect" on the very functioning of the Swiss dual apprenticeship system. It acts as a kind of filter, blocking 'unsuitable' young people at T1 level and allowing only more competitive profiles to enter the dual system: a filtering which naturally meets the interest of the companies and, *de facto*, increases the chances of these more competitive profiles of successfully completing the apprenticeship and finding a job after graduation.

Despite these selection issues in T1, the overall Swiss data are relatively robust, particularly when viewed in an international context, as demonstrated by the indicators presented in Table 1. The VET system, as the general education system, can offer training to many young people, leading them to a USE diploma, which opens the door to further training or to the labor market. This remains true even though it is highly selective, especially around T1. Here, we encounter a certain paradox.

One possible explanation could be the high demand for apprentices. The fact that the curricula are clearly geared to the needs of companies encourages Swiss companies to engage in the dual model in order to ensure the succession of qualified internal labor and the shortage of qualified labor in Switzerland has been such that companies have had to train not only young people with highly competitive profiles, but also young people with less competitive profiles. This produces certain inclusion effect: also, vulnerable profiles have had the chance to find an apprentice position. They might have to wait one or two years to find a suitable training, running the risk to interrupt their apprenticeship once or twice, but, in the end, a large majority of young people obtain a USE diploma. The problem that arises is whether and how these indirect effects can be stimu-

lated, and whether Swiss education policy is in a position to control these indirect effects, or whether it simply leaves them to the goodwill of the market and companies.

5 Conclusion

VET in both Switzerland and Spain has nowadays a relatively good reputation, a long standing one in the case of Switzerland, and one that has increased significantly in the last three decades in Spain. Selection in access seems to be one of the reasons for such prestige, set by companies in the Swiss system and by the GESO in the Spanish one.

Our analysis reflects a debate that has been recently tackled by European institutions, like the one held by CEDEFOP in October 2024 named 'excellence and inclusion at the crossroads', although excellence has greater visibility than inclusion[13].

If we take a step back and consider the two cases presented in the previous pages, the following ideas can be concluded: both countries find major problems in T1; both countries face tensions between reputation and inclusiveness of the system, although these are addressed differently; both tend to externalize measures that remain in the margins of VET to preserve the prestige of the system; which results in both the Swiss dual and the Spanish school-led system being capable to improve their inclusiveness at the institutional level. We explain each of these conclusions below.

Despite their differences, both countries present major problems when considering T1, i.e. access to USE programs, whereas obtaining a diploma and the T2 seems to raise less difficulties. This result is surprising for Switzerland, since international indicators did not point to such a problem, and they indicate a filtering action that is evident in the case of Spain, as it is legally regulated.

It is worth taking a closer look on that blind spot of international indicators. The choice of indicators at international level is particularly influenced by the many countries that have a school-led system and for which the major challenges in the transition between the world of education and the world of work manifest themselves at the level of T2 and not T1. This is generally not considered as problematic insofar the supply of schooling easily covers the demand for training and public policies allow inclusion in school training even for young people with difficulties. Symptomatic of this is the fact that none of the 54 indicators selected by CEDEFOP[14] refers directly to the difficulties that young people might have in accessing training at USE level.

Against this backdrop, with indicators that focus predominantly on T2 and obtention of a diploma, it is not surprising that the picture of the Swiss system does not reveal problematic areas. But this first finding is also surprising for the Spanish system, because as a school-led system, we expected greater ease in T1 for all young people coming from LSE, in the hope that the system would be inclusive by default.

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13 https://www.cedefop.europa.eu/el/events/future-vet-excellence-and-inclusion-crossroads The hashtag #VETExcellence goes by #FutureofVET, while there is no hashtag for inclusion

14 Cf. Cedefop Key indicators on VET: https://www.cedefop.europa.eu/en/tools/key-indicators-on-vet

However, what is particularly interesting to note is that beyond this common problem, the reasons for its emergence in Switzerland and Spain are profoundly different. In Switzerland, the difficulties of T1 are a combination of two factors: restrictive policies on access to USE general education and a system of selection of apprentices by companies, which leaves out vulnerable young people.

In Spain, the problems at T1 are linked to the conditions of access to USE, both general and vocational, which require an LSE diploma, which de facto excludes young people who do not achieve this certificate from any further formal education.

In Spain, however, the introduction of such a condition of access to USE courses was motivated by the desire to improve the reputation of VET programs; in this regard it has been a success in recent decades. On the Swiss side, it should be noted that the selective nature of the system, which stems directly from the freedom of companies to choose if they want to train and to whom they want to train, also helps to ensure the reputation of the dual VET system: companies can choose better prepared young people and, as a result, also achieve very good training results, which has a positive effect on the sector as a whole. But, as we have seen, this also has the effect of excluding young people who are not so successful.

In the light of these considerations, we can ask ourselves whether VET policies at USE still gives more value to the reputation of the system than to its inclusiveness, as seems to be the case in the two examples we have dealt with in this paper. If this is the case, we can understand the selection at this level as a desired effect of this struggle. But here we find some kind of contradiction, because at the same time the demand for inclusiveness has been placed on VET at USE rather than on its alternative, the academic pathway at USE, which remains an elitist pathway. This kind of contradiction emerges clearly from educational policies in several Swiss cantons, where academic USE is considered an elite pathway and VET is seen as the most appropriate offer for learners with certain difficulties, but at the same time, access to VET remains difficult for exactly these types of learners. Anyhow, the role of VET in the economy and the expectation of providing properly qualified workforce to contribute to the advancement of the economy through productivity and competitiveness seems to be more relevant than the social function VET might fulfill. It is perhaps for this reason that both Switzerland and Spain, aware of the selection mechanisms, propose external measures to mitigate the inclusion problems they encounter, as we explain hereafter.

It is worth noting that in both systems, external non-formal solutions are put in place to try to recover the young people who are initially excluded by formal training. In Switzerland, these young people have the opportunity to follow temporary solutions, programs designed to help them improve their profiles so that they have a better chance of finding an apprenticeship. In Spain, these young people can follow non-formal training courses designed to help them integrate into the world of work, without however receiving a diploma recognized by the formal education system. Even if these non-formal solutions in both countries are of different nature and have different effects, both systems have established them as external measures, allowing them to avoid intervention in the internal structures of the system, while protecting at the same time the quality and reputation of their VET at USE.

However, these extra-systemic solutions can be criticized in both countries. In Switzerland, various cantonal education policies are explicitly aimed at encouraging direct access to training leading to a USE qualification, thereby reducing the number of people in these transitional solutions. In Spain, the new VET law in 2022 opens the door to possible recognition in the education system of qualifications acquired in these non-formal training courses.

We can't avoid coming back to the comparison we proposed between a system based on a dual model and a system based on a school model. Our analysis of the situation in Spain and Switzerland shows that, from the point of view of the inclusiveness of the system, both models face problems, even if their origins are different. Our article therefore does not allow us to conclude that one model is superior to the other in terms of inclusion. Even if the Swiss system is clearly better considered than the Spanish one in international comparison, when it comes to their inclusiveness, both could do much better, even Switzerland (Duc & Kammermann, 2024).

To conclude, we want to reconsider the exercise of international comparison itself and the challenges it poses. It has been particularly difficult to find aspects that lend themselves to direct comparison between the two countries, beyond a few general points of reference. The issue of inclusion, analyzed on the basis of the three levels, constituted the "common problem" (Dubar et al., 2003), providing us with the general framework within which to construct our comparison. However, each time an in-depth analysis of a particular aspect has revealed profoundly different institutional, economic or cultural conditions, it has been difficult to find analogies that would allow the comparison to be maintained at a more detailed level. For this reason, we have refrained from a systematic point-by-point comparison, preferring instead a general description of the situation in the two countries based on these three levels. This enabled us to show the emergence of the issue of inclusion in two profoundly different contexts and to note the equally different reactions of the two systems.

We believe that we have been able to show how two countries with very different characteristics are confronted by the challenges of inclusion in their respective education systems. This is a pressure that comes from outside VET and that is related to the expansion of USE, for which VET is demanded to be more inclusive than the post-compulsory academic pathway, where elitism and selection are not under question. We have also shown that these challenges do not necessarily appear where we might have expected to find them, especially if we were to rely solely on statistical indicators and international typologies. In this way, we hope to have contributed to advancing the debate on the challenges of inclusion and selection of VET at USE and providing new elements to understand these challenges.

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Principal online sources

Eurostat data base: https://ec.europa.eu/eurostat/web/main/home
CEDEFOP Key indicators on VET: https://www.cedefop.europa.eu/en/tools/key-indicators-on-vet
OECD Education at a Glance: https://www.oecd.org/en/publications/education-at-a-glance-2024_c00cad36-en.html
Swiss Federal Statistical Office (SFSO): https://www.bfs.admin.ch/bfs/en/home.html

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General Section

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Supporting Peer Feedback Formulation in a Video-Based Digital Platform in Technical Vocational Education

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Abstract *Vocational education and training (VET) students often have difficulties with formulating peer feedback for various reasons. This is a problem as only well-argued peer feedback positively affects learning. Thus, supporting peer feedback formulation is desirable. This study explores the effectiveness of a prompt consisting of evaluative markers and sentence openers on the quality of peer feedback formulation. 48 VET students in a technical domain in the Netherlands watched the same five videos on practice and then provided peer feedback to the performers. An experimental group (24 students) had access to evaluative markers and sentence openers to support feedback formulation. The control group (24 students) did not have access to these supports. The generated feedback was analysed on feedback quality indicators and compared using independent sample t-tests. The results indicated that prompt-based supports can improve the quality of student-formulated peer feedback. We discuss the importance of carefully designed prompts and how they can contribute to better peer feedback formulation.*

Title *Supporting Peer Feedback Formulation in a Video-Based Digital Platform in Technical Vocational Education*

Keywords *Feedback Formulation; Vocational Education; Video Annotation; Sentence Openers; Evaluative Markers*

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1 Introduction

Peer feedback is becoming more popular as a form of formative feedback. It requires students to take up the teacher role and (formatively) assess the performance of their peers, and is expected to contribute to learning effectively (Harris & Brown, 2013; Panadero & Lipnevich, 2022; Shute, 2008). Peer feedback has several advantages over tutor feedback, as giving and receiving peer feedback requires students to take a critical view towards the practice and opinions of their peers, which may lead to improved understanding and performance over tutor feedback (Gielen et al., 2010). This is because peer feedback is analysed more critically by the receiver, as peers are novices that could give inaccurate or even incorrect feedback.

But to be effective, feedback has to be formulated in such a way that it is accepted by the receiver (Alqassab et al., 2023; Panadero & Alqassab, 2019; Strijbos et al., 2010). Prior research established that effective peer feedback is specific and concrete and that it contains congruent reasoning (Hattie & Timperley, 2007; Shute, 2008). But how specificity and justifications of peer feedback can be enhanced has not been studied extensively. Furthermore, peer feedback is common in domains such as health care and teacher education, but not in other vocational education and training (VET) domains, such as commercial and technical domains. Because of this, students in these domains have little experience with giving and receiving peer feedback, and are therefore also less likely to engage in critical thinking activities themselves (Jossberger et al., 2010).

Past research on peer feedback has been focused on other aspects of peer feedback. Most notably, feedback accuracy, meaning whether peer feedback is consistent with that of experts (Andrade, 2019). Therefore, most supportive measures for formulating peer feedback have been designed to help provide feedback on the elements that experts pay attention to. As a result, rubrics have become very popular supports (Panadero & Jonsson, 2020). But rubrics do not help students build a clear justification for their feedback.

Furthermore, students have difficulties writing feedback that is specific and descriptive and need to be supported to do so (Boldrini & Cattaneo, 2014). Thus, further support to generate effective feedback is necessary, not only in terms of what to focus on, but also on how to formulate feedback. This is especially important in VET, as students often do not have sufficient language skills to write cohesive argumentation for their feedback. For example, demographic studies show a decrease in literacy skills (OECD, 2013), and teachers report that VET students have difficulties with reading comprehension and writing (Jossberger et al., 2015). As language skills of students may be inadequate, we argue that supporting students with writing activities such as formulating peer feedback is of great importance.

A possible way of support is to provide students with sentence openers. Sentence openers are predefined phrases to start a sentence (van Joolingen et al., 2005) and have been used in online learning environments to support students in formulating hypotheses (van Joolingen et al., 2005) and arguments (Yiong-Hwee & Churchill, 2007). This type of support has not received a lot of research attention as of yet. Thus, it remains unclear under which conditions it provides favourable results.

Therefore, exploring the effects of sentence openers on formulating peer feedback is the focus of the current study. Specifically, we focus on exploring the effects of support-

ing VET students with sentence openers to write well specified and justified feedback. In general, we expect that better facilitated peer feedback may lead to better learning results and a more critical outlook on the practice VET students reside in in their daily or prospective jobs. The current study is conducted in a technical VET domain.

2 Theoretical Framework

2.1 Defining and Exploring Peer Feedback in VET

Feedback is a broad concept that can be defined and executed in various ways. In general, feedback is aimed at identifying mistakes and good practice, questions on decisions and performance, and providing suggestions for future performance to learn and improve practice (Alqassab et al., 2023; Gielen et al., 2010; Panadero & Lipnevich, 2022). Feedback can be directed at the task, process, self-regulation or personal level (Hattie & Timperley, 2007), be given through various modes (e.g. in person, written or video-recorded) and by various actors (e.g. self, peer, expert, computer) (Shute, 2008). Different types of feedback have their place in education and research and will depend on the learning task at hand.

In VET, various forms of feedback can be found. For example, e-learning environments allow for predefined feedback on mistakes given by a computer. In apprenticeships, in-person feedback by a tutor is more common (Mikkonen et al., 2017; Schaap et al., 2023). Further, workplace simulations or video recordings allow peers to also evaluate performance and provide additional feedback, either in-person or in writing (Gavota et al., 2010; Ortoleva & Bétrancourt, 2016). There is a difference between peer and tutor feedback. Gielen et al. (2010) describe that the main difference is the authority of the feedback provider. Tutors are experts in their field, while peers are not. Because of this, the accuracy and correctness of peer feedback may differ from teacher feedback. Despite this, peer feedback can be even more effective than tutor feedback, due to the uncertainty of feedback correctness. This uncertainty triggers the process of reflection in the feedback receiver (Gielen et al., 2010). Furthermore, also the feedback giver can benefit from peer feedback, training their noticing skills, feedback formulation and developing a critical stance on practice (Panadero & Lipnevich, 2022) and personal interdependence (Gielen et al. 2010). We conclude that peer feedback is an important learning activity in VET.

While peer feedback was found to be helpful for the learning processes in VET in general, VET students generally have little experience with evaluating the performance of others (Cattaneo & Motta, 2020; Schaap et al., 2012), as they tend to lean on the evaluations and feedback of their tutors and colleagues more than their own and peer student evaluations (Josserger et al., 2010; Mikkonen et al., 2017). This trend is underlined by very little scientific publications on the topic of peer feedback in VET. In the current study, we focus on feedback given by a student that is directed at a peer. This poses specific challenges that we will discuss in the next paragraphs.

2.2 Peer Feedback Quality

The process of generating and receiving effective peer feedback is delicate. Kollar and Fischer (2010) describe the process of peer feedback as one that moves from task performance to evaluation, to feedback formulation, to feedback reception to task revision. This means that generating feedback requires specific attention to how the feedback is received, taking into account the feelings and understanding of the receiving end. Then, also the receiving end needs to make an effort to process the feedback, understanding the intentions, reasoning and value of the received feedback (Panadero & Lipnevich, 2022).

An idea of what high quality peer feedback entails also needs to be explicated. We adopt the peer feedback quality indicators of Gielen et al. (2010), who proposed several criteria indicators for written peer feedback. The most relevant criteria indicators are specificity of the feedback, justification of feedback and providing suggestions for alternatives. Furthermore, the researchers mention appropriateness of feedback compared to assessment criteria and clear formulation.

First, feedback should be sufficiently concrete and specific (Alqassab et al., 2023; Gielen et al., 2010; Shute, 2008). Concrete feedback means that the feedback refers to specific behaviours or aspects of the performance. In other words, the feedback does not just state: "Well done", but includes a clear topic to indicate *what* was done well. Second, justification of the feedback is of importance. This requirement is related to concreteness of feedback, indicating the reasoning behind both positive and negative feedback. As peers are not authorities in the domain, their feedback might be inaccurate, incomplete, or even plain incorrect (Strijbos et al., 2010). Therefore, justification is necessary, as it allows the receiver to better understand and evaluate the quality of the feedback, prior to revision of the performance (Gielen et al., 2010). Thirdly, and in line with justification, Hattie and Timperley (2007) conclude that both positive and negative feedback can be beneficial, but this depends on the focus of the feedback. In general, negative feedback yields positive learning outcomes, especially if aimed at the performance and provides a form of justification. And better yet, suggestions for future practice should be included (Gielen et al., 2010). Positive feedback can also yield beneficial results on motivation, but generally has a lower effect on cognitive learning outcomes compared to negative feedback. Further, appropriateness of feedback towards assessment criteria is seen as an important aspect of peer feedback. As is the way feedback is formulated, meaning addressing the receiver personally (Gielen et al., 2010).

2.3 Supporting Peer Feedback Quality

There are several effective supports to help students formulate quality peer feedback. The general consensus is that students need to be directed in their attention, to focus on relevant performance aspects. For this, the use of rubrics and prompts are common supports. A rubric is a list of performance aspects, guided by indications for good and bad quality performance of these aspects (Panadero, 2017). Rubrics have been studied extensively in formative assessment contexts, and were found to positively influence the way students provide feedback, as they help students focus on relevant performance quality criteria and to more accurately evaluate the quality of their performance (Panadero &

Jonsson, 2013, 2020). The effectiveness of rubrics has been studied often and proven to a sufficient degree. Because of this saturation, the current study will not focus on rubrics, but rather on prompting students in various ways.

The use of prompts was found to be an important way of supporting students in feedback activities. A prompt can be defined as a written question or statement directed at the performance, with the aim to direct student attention on specific elements or to stimulate them to write feedback in a specific way (Gielen et al., 2010). In general, the effectiveness of prompts for feedback purposes is acknowledged, allowing for more and higher quality feedback and reflection (Cattaneo & Motta, 2020; Gielen et al., 2010). The implementation of prompts is rather diverse, as they can take many different forms and may address various topics.

Mostly, prompts are predefined questions that either pop-up at a certain time during the activity, or are visible to students during the whole activity (Kori et al., 2014). But besides prompting students with questions, we argue that prompts can also manifest as sentence openers. With sentence openers, students do not receive directive questions, but are prompted to finish predefined sentences (Gielen et al., 2010; van Joolingen et al., 2005). While sometimes mentioned in the literature, sentence openers have not been studied often. The available studies do indicate a positive attitude towards their use, especially for students new to formative assessment (Aamri, 2018; Barkhuizen & Wette, 2008; Farkas, 2019). Sentence openers may reduce cognitive load for students, as they do not have to think about formulating their feedback as much. On the other hand, forcing students to use sentence openers might have adverse effects on creativity and motivation, which may reduce students willingness to provide feedback (Farkas, 2019; Gielen et al., 2010). We argue that this downturn is not to be expected with VET students with lower language proficiency and little experience with peer feedback formulation, but that they may in fact help these students formulate higher quality feedback than they would without sentence openers.

Using symbols, such as traffic lights to prompt evaluation is another way of prompting, and has not been researched much. Such evaluative markers come in the colours green, yellow and red, respectively representing good, questionable and negative performance. In this sense, traffic light colours prompt students to evaluate. Similar to written prompts, evaluative prompts allow learners to quickly pick an evaluation and apply it to the performance, again possibly lowering cognitive load. While such evaluative markers have been mentioned in a couple of studies (Colasante & Douglas, 2016; Harris & Brown, 2013; Hulsman & van der Vloodt, 2015; Lai et al., 2020; Lavoué et al., 2015), instances of their use are scarce and the effects of these supports have not been thoroughly studied yet. Thus, exploring the effects of evaluative markers on peer feedback seems to be a worthwhile endeavour, especially in a domain where peer feedback is not commonly used yet.

2.4 Current Study

In the current study, we study the effectiveness of two types of prompts, evaluative markers, and sentence openers, on peer feedback quality produced by VET students in a digital video-annotation environment. Our research question is as follows: Does a prompt-

based support consisting of evaluative markers and sentence openers promote the quality of peer feedback formulated by VET students in a video-based digital platform? Based on the literature, we expect that this prompt-based support may increase peer feedback quality.

3 Method

3.1 Participants and Procedure

Participants in this study were dual VET students in the technical domain of Electrician Education in the Netherlands. In dual VET, students work four days a week as an apprentice and visit school the other day. Participants for this study were enrolled at various vocational schools and participated on their school day. The study procedure was approved by an ethics committee of the University of [redacted]. After agreeing to participate, each student was invited into a face-to-face session with the researcher. The researcher explained the ethical research affordances, the study procedure and finally the video-annotation software. There were no incentives for participation.

Participants were asked to give feedback on the videos as if they would write the feedback to a peer. Participants were told to focus on general aspects of performance in the domain, these being safety, procedure, and workplace organisation. The subject of feedback was a set of five short (one minute) videos of performance of common tasks by anonymous apprentices in the domain. Thus, each participant gave feedback on the same five videos. The same researcher was present during the process, primarily to answer technical questions about the video-annotation software. From pilot studies, we knew students had little experience with feedback and that it was important to help them get started by asking some generic questions without value judgement, like: "What did you think of this performance?" and "what would you say to this person if he was your peer?"

Feedback will be given through means of video-annotation. Video-annotation is a relatively new tool that allows users to create time-based comments in a video (Evi-Colombo et al., 2020). With video-annotation, instances of feedback are directly related to specific moments in a video. Participants were randomly assigned to either a control or experimental group. The experimental group had access to supports embedded in the digital video viewing environment. The control group used the same environment, but without the embedded supports. The supports embedded into the video-annotation software were evaluative markers and sentence openers. The evaluative markers represented traffic light colours: red, yellow, and green. When they selected any of these markers, it would be linked to a specific time in the video. Additionally, selecting the marker would initiate a comment, with a sentence opener. The sentence openers were respectively "Not good, because", "I have some doubts or a question, namely" and finally "Good, because". The control group did not have access to these supports and had to write their feedback from scratch.

3.2 Video Vignettes

Participants were asked to watch five videos on workplace practice. The videos all captured a part of a common domain specific procedure, performed by a student, and were recorded using a head-mounted camera. The idea behind these videos was to give a first person view of the workplace, showing the work-in-progress, tool usage and workplace organization. We asked experts to review the videos to check whether there are some typical mistakes and good behaviours in them for students to comment on. The content of the videos was as follows:

- Clip 1: a student conducting a last-minute risk analysis before working on a large consumer unit indoors.
- Clip 2: a student working on a transformer outside. He is in the process of creating an earth screen by twisting copper wires and then cutting them to attach them to the installation.
- Clip 3: a student working in a pit outside. He is in the process of branching a cable under voltage to connect a house to the power grid.
- Clip 4: a student working on a large indoor consumer unit similar to the first video. This student has started work and is close to finishing.
- Clip 5: a student measuring voltage on an electricity meter that is being replaced.

3.3 Data Analysis

In this study, students created video-annotations that contained written feedback. They would write one or more annotations per video. The video-annotations that participants created were analysed on feedback quality. In principle, each video-annotation was seen as a unit of analysis. But students would sometimes only use one annotation to comment on multiple aspects of performance. In these cases, we took the feedback on each topic separately. For the remainer of this paper, we will refer to the unit of analysis as a 'comment'.

Each comment was analysed on feedback quality indicators following a coding scheme. Coding was done dichotomously. For each comment we analysed which quality indicators were present. Those present were coded as a '1' and those that were not, were coded as '0'. Specifically, we coded feedback on the valence of feedback, meaning whether it was positive, critical or a question, specificity, and presence of justifications and suggestions. Definitions of these codes are presented in Table 1. This coding scheme is an adaptation of the work of Gielen et al. (2010). The scheme of Gielen et al. (2010) was applied to a context in which students wrote longer sections of feedback, not related to a video. Because of this difference in context and feedback mode, we could not apply their framework directly. We did not include the balance between positive and negative feedback, as we only found five of these instances in our data sample. The elements appropriateness of the feedback compared to assessment criteria and clear formulation (Gielen et al., 2010) were deemed less important for the current study and were thus omitted. This is because in our study, a wide range of performances was presented, which could also be interpreted in multiple ways. Further, we deemed it inappropriate

to include feedback formulation in this simulated context, as students did not know the persons, they would give feedback to.

We found there are two ways students constructed their sentences, and these greatly influenced coding of their feedback. In the first way, students would formulate feedback as follows: [specific topic] is [evaluation], because [reasoning]. The other way is [evaluation], because [specific topic], which means [reasoning]. In this second formulation, a pitfall in coding was that we were inclined to code the specific topic as the reasoning. This can be illustrated in the following sentence: "Not good, because you did not wear gloves." In this case, one could easily identify not wearing gloves as a justification for the evaluation. However, it does not provide any reasoning why this is wrong. A solid justification would include an argument such as "you risk getting a shock so close to live wires". Because of these findings, we decided the term 'reasoning' was better fitting than 'justification' for our data.

A second rater coded 50 comments, which were compared and discussed with the first rater, finally resulting in a kappa of 0.82 for the nature of comments, $k = 0.87$ for specificity, $k = 0.83$ for reasoning and $k = 0.84$ for suggestions.

Table 1: Overview of the Feedback Aspects and Definitions

Feedback quality		**Definition**	**Example**
Nature of comment	Positive	Positive feedback on the performance was given.	'Nicely organised tools.'
	Critical	Negative feedback on the performance was given.	'Do not place your tools on the ground.'
	Question	Questions raised to clarify aspects of the performance or the reasoning behind the way of working	'Why did you measure voltage on so many places?' 'What are you going to measure?'
Quality indicators	Specific	The comment explains *what* is right or wrong, clearly relating to a specific aspect of the performance.	'He's wearing his safety gloves.'
	Reasoning	The comment explains *why* something is right or wrong and/or *how* something might affect outcomes.	'You should press this three times, not two.' 'Tighten it right away, or you might forget.' 'You might trip over your tools.'
	Suggestion	The comment includes a suggestion for an alternative.	'I would punch holes instead of jabbing my instrument into the cable.'

After categorization and evaluating the quality indicators, we performed independent sample t-tests to compare the experimental and control group to analyse whether the experimental group created higher quality feedback.

4 Results

In total, 48 students participated in this study, of which 24 were assigned to the experimental group and 24 to the control group. Overall, the data sample consisted of 293 feedback comments. The experimental group created significantly more comments ($M = 6.67$, $SD = 1.58$) than the control group ($M = 5.54$, $SD = 2.04$) at ($t(46) = -2.135$, $p = .038$). The effect size for this was medium with a Cohen's d of 0.62. Most feedback was critical, as 168 comments consisted of critical feedback and 99 were positive. Not many questions were posed (26 comments). In some cases, feedback was clearly critical but was presented by students as a question. In those instances, we chose to code the comment as 'critical', regardless of the question form. Thus, the comments that are defined as questions in this data, do not directly contain a value judgement on the performance.

Table 2: Overview of the Feedback Nature per Group

	No support			**With support**			**t-test**
	%	*M*	*SD*	*%*	*M*	*SD*	*p*
Positive	29	1.58	1.98	38	2.54	1.69	.078
Critical	67	3.71	2.23	49	3.29	1.81	.484
Question	5	0.25	0.68	13	0.83	1.09	**.032**
Total	100	5.54	2.04	100	6.67	1.58	**.038**

Table 2 presents an overview of the feedback nature per group. In this table, ratios and means are used to compare the nature of comments between groups. For example, the percentage ratio shows that in the control group, 67 percent of comments contained critical (negative) feedback, while in the support group this was 49 percent. The t-tests indicate that the support group created less critical comments than the control group, but significantly more questions (medium effect size at Cohen's $d = 0.64$). Although not significant, the support group also appeared to create more positive comments than the control group.

Table 3: Overview of the Feedback Quality Indicators per Group

	No support			**With support**			**t-test**
Quality indicator (n)	%	*M*	*SD*	%	*M*	*SD*	*p*-value
Unspecific (44)	34	0.11	0.32	66	0.18	0.39	.103
Specific (249)	47	4.92	2.02	53	5.46	2.27	.386
Reasoning (112)	44	2.04	2.18	56	2.63	2.28	.369
Suggestion (102)	46	1.96	1.40	44	2.29	1.57	.442

The results of the analysis of quality indicators of feedback are presented in Table 3. Characteristics of feedback quality were the presence of specificness, reasoning and suggestions for improvement. In this table, we reported the percentage ratios and means per quality indicator per group. We included both specific and unspecific comments as mutually exclusive quality indicators to obtain deeper insight in the data. The quality indicators specific, reasoning and suggestion are not exclusive, which means that multiple quality indicators could be present in a single comment. From this data, it becomes apparent that for the total dataset, most comments were specific, but that other indicators were found less often in both groups. Independent t-tests indicated no significant differences between groups.

As the number of comments between groups differs, further analysis of the quality indicators is performed based on the nature of the comment. Similar to Table 3, Table 4 presents the quality indicators per group, but now split out between positive and critical comments. This allows for a more comparable view of the comments. The distribution of positive and critical comments is quite skewed, possibly because of the relative ease with which students can create a positive remark in the support group, using the evaluative markers. Stating something was good requires less effort than saying it was wrong, as this requires reasoning.

Table 4: Overview of the Feedback Quality Indicators Found Within Positive and Critical Comments per Group

		No support		**With support**		**t-test**
		M	*SD*	*M*	*SD*	*p*-value
Positive comments	Unspecific	0.46	0.72	1.21	1.25	**.015**
	Specific	0.96	1.55	1.33	1.79	.441
	Reasoning	0.17	0.38	0.92	1.21	**.006**
	Suggestion	0	0	0.08	0.28	.162

		No support		With support		t-test
Critical comments	Unspecific	0.04	0.20	0	0	.328
	Specific	3.67	2.28	3.29	1.81	.531
	Reasoning	1.83	2.14	1.50	1.53	.538
	Suggestion	1.92	1.44	2.00	1.69	.855

Table 4 shows that the support group more often created positive comments that contained reasoning. Furthermore, the support group created more unspecific positive comments than the control group did. For the other quality indicators, no notable differences were found.

5 Discussion

The current study was conducted to explore the effects of embedded feedback support in a video annotation environment on peer feedback quality. Our research question was aimed at finding out whether prompt-based supports improved the quality of peer feedback. Based on our results, we can conclude that the support helped students formulate higher quality feedback, mostly in the form of a higher quantity of comments and more reasoning for positive comments. No increase was found for other feedback aspects such as the specificity or suggestions. Further, students with access to support asked more questions to the performer than the control group did. Our overall conclusion is that both the marker and sentence opener prompt affected student feedback.

5.1 Interpreting the Results

We found that the support led to students creating more comments than without the supports. We believe this was caused by the relative ease of creating comments in the support group. Because of the supports, students only needed to click on a marker to make a positive comment, whereas the experimental group would need to think about a formulation, requiring a lot more effort from the students. Similarly, students in the experimental group also asked more questions than the control group. It seems that students are more likely to use the markers to create different types of feedback than just critical feedback. We believe this can be interpreted as a positive outcome, as balanced feedback valence is believed to be most effective for learning (Prilop et al., 2021). Based on the results of this study, it appears that evaluative markers can influence the nature of feedback that students give, reminding students that feedback entails more than giving critique.

A significant difference between groups was found for reasoning, with the support group providing more reasoning for positive feedback. Part of the explanation for this probably lies in the varying number of positive comments between groups, as the experimental group did provide more comments in general, and though insignificant, also more positive comments than the control group. As stated, we postulate that the evalua-

tive markers may have been the cause of the higher number of positive comments. Further, it seems logical that the sentence openers have influenced students to also provide reasoning for why something was evaluated positively.

We found no differences for the quality indicators specificity and suggestion. A possible explanation for the comparable specificity of comments is that both groups used means of video-annotations to create comments. Studies have shown that video-annotation allows for more specific feedback, as it relates to specific moments in a video of task-performance (Leung & Shek, 2021; McFadden et al., 2014). As a result, it is not surprising that both groups had relatively high scores for specificity of comments. Students apparently were able to easily relate their feedback to specific moments in the video. The comparable suggestion score might be attributed to the fact that students were not directly prompted to include this in their comments. The markers prompted students to include questions or positive feedback, and the initial prompt "because" would invoke students to write a justification, but not necessarily an elaborate description of the consequences and alternatives. We could very well expect that a more complex prompt could invoke further elaborations and suggestions from students. For example, instead of only a sentence opener, follow-up sentences could be prompted too: "Not good, because…" "This could lead to…/A risk is…" "Next time, you could try to…" or "It would be better if…". The prompt in our study was only focused on the prompted statement 'Not good, because'. We suspect that this might not have been specific enough, and that some students were more inclined to complete that sentence in a way that related to the specific topic. For example, the sentence "Not good, because… you didn't wear gloves." only explains what was wrong, but not why it was wrong, nor did it really explain the risks or alternatives. In this sense, the prompt we introduced might actually have supported specificity or reasoning, depending on how students interpreted it.

Another notable trend to discuss is the acceptance of the feedback by the feedback receiver (Alqassab et al., 2023; Panadero & Alqassab, 2019; Strijbos et al., 2010), which was not a part of the current study. However, we noticed that students sometimes assume some form of shared knowledge that the feedback receiver, as fellow participant in the domain, will understand. Students often try to justify their feedback using sentences such as 'as it should be done', or 'using the correct procedure'. They seem to assume that the feedback receiver will understand what this ideal way of working is. When the researcher asked students what this 'correct way' meant, they were able to explain verbally why something should be done in a certain way, and what the consequences of not doing so are. However, this often is not visible in their comments. We do not expect that feedback receivers will always be able to understand the correct way of working, as sociocultural practices and personal experiences may differ greatly across sites within a domain (e.g. Roth, 2014). Therefore, we would suggest that it might be very beneficial for student learning to be guided in sense making of the various perspectives on practice that simultaneously exist, or that feedback activities are performed between peers who know each other and their work contexts. Of course, this finding can also be caused by the context of this study, in which students do not know the recipient of their feedback, or perhaps also felt pressure to find things to comment on, that they would not have mentioned in a natural setting.

In addition to this argument, we also need to discuss the necessity of reasoning. As not all topics of performance really needed to be justified or elaborated in this study. A commonly commented aspect of the performance was the workplace organisation. Stating that an environment was a mess did not really need to be elaborated on, as it was clearly visible in the video. As we did not provide rubrics to support students to pay attention to specific aspects of performance, sometimes more general comments about work environments were to be expected, as these performance aspects stand out most. Of course, the context of this study could also be of influence here.

5.2 Limitations

A limitation to this study is the combined nature of the support. By combining both the sentence openers and evaluative markers, the effects of the isolated supports remain inconclusive. Further, in this study students were asked to provide feedback on five short instances of diverse task performance. While it is a strength of this study that all students provided feedback on the exact same performance, a more focused approach towards one specific task could allow for a more detailed analysis of peer feedback. Finally, this study is performed in a simulation. The peer feedback providers did not know the actual performers, nor would the feedback reach them. Anonymity is of influence on peer feedback provision, leading to more critical evaluations (Panadero & Alqassab, 2019). We also expect that due to the simulated setting, participants probably paid a little less attention to how the feedback would be received than in a realistic setting. Similarly, the presence of a researcher during the process may have influenced the feedback output somehow, but as this was the case for all participants, the groups remained comparable. In relation to comparable participant groups, the data sample was collected at various VET locations. Because of the randomized approach to assign participants to either condition, the possible bias of how these VET contexts influence the results is ruled out as much as possible.

5.3 Conclusion and Implications for Future Research

This study has shown that it is possible to influence student feedback using various prompts in a VET setting. While at first sight, the study results mostly did not indicate significant results between both groups, we can still conclude that a prompt-based support, combining evaluative markers and sentence openers, can improve peer feedback quality. Providing students in VET, and perhaps also outside of VET, with additional supports like sentence openers and evaluative markers may help them to formulate more effective peer feedback. This is especially true for students who are new to providing peer feedback. Using these supports as scaffolds and examples for types of feedback and ways to formulate feedback can help them understand how to formulate quality feedback. But as has been noted in previous research, providing experienced feedback providers with these supports might greatly reduce their motivation, as they lose some freedom to formulate the feedback in a way they want (Gielen et al., 2010). Thus, we conclude that sentence openers and evaluative markers can both help to support peer feedback quality for VET students.

Future research on supporting feedback provision in VET is needed, as still a lot is unknown. We invite researchers to try and alter the studied supports to fit other contexts and approaches. We postulate that results might have been different if other sentence openers, or even worked out examples of feedback were given. For example, we could have prompted students to explain noticed issues and give suggestions for alternatives. Such additional prompts might provide the required guidance for students to formulate higher-quality feedback. Additionally, instead of only sentence openers, a support could also embed other parts of sentences, or prompt certain sentence structures. Further research on such supportive elements might provide additional and complementary insight on the effects of student feedback quality in digital environments.

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Book Review

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Deissinger, Thomas & Melnyk, Oksana (Eds.) (2024). Partnership-Based Governance and Standardization of Vocational Teacher Education in Ukraine.

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1 A Very Timely Book

Having worked in the past with both editors of this volume, Thomas Deissinger and Oksana Melnyk, I have great respect for them as scholars in the field of Vocational Education. Both know very well the Ukrainian landscape, before and during the Russian invasion in 2014 and more recently in 2022. Both also know many higher education institutions and universities in Ukraine, particularly those in charge of preparing vocational education teachers. The book they have edited is one of the results of the Erasmus+ action 'New mechanisms of partnership-based governance and standardization of vocational teacher education in Ukraine (PAGOSTE)'. The volume is very opportune in informing that, even despite the war going on, there are policies, initiatives and efforts taken in higher education institutions in the country to improve the quality of the education of vocational education teachers.

The book has a brief introduction and three parts, and most chapters are written by several authors. Part I has seven chapters, part II four chapters, and part III two chapters. It also has a one-page preface written by the Minister of Education and Science of Ukraine.

Part I is on theory and practice of governance in teacher training for VET, and it consists of chapters addressing VET teacher education in different countries, some of them written by well renowned academics in this field like Philipp Gonon, Kevin Orr or the editors of the volume themselves. Chapter 1, by Lena Freidorfer and Philipp Gonon covers Switzerland; chapter 2, by Erika Smith, explains the tensions across levels and sectors in

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Australia; chapter 3, by Kevin Orr and Nena Skrbic, speaks on recent history about initial teacher education in Further Education in England. Chapter 4, by Selena Chan, focuses upon reform in vocational education in New Zealand and the expected impact upon the education of VET teachers; chapter 5, written by Thomas Deissinger and Oksana Melnyk, addresses the topic of the volume, discussing governance on VET teacher education in Germany while chapter 6, by Richard Fortmüller, focuses upon standards in VET teacher education in Austria. The final chapter in this part, written by Paolo di Renzo and Giovanni Serra, switches to adult education and lifelong learning in Italy. Part I is therefore varied both in academic scope as well as in geographical terms, as some European and Pacific countries are illustrated, although both the explanation of why these countries and approaches are selected and their relevance for Ukraine are missing in this volume.

Part II makes an important shift, perhaps even a rupture, with part I, as it entails four chapters on evolving experiences changing VET teacher education in four different higher education institutions in Ukraine through the cooperation of different partners from HE institutions, the professional bodies and other social actors. It is done in such a way that part I and II can be read independently.

Chapter 8 is authored by Svitlana Tsymbaliuk, Maryna Artiushyna, Oksana Sarkisova, Tetiana Shkoda and Larysa Korvat; with some of which the author of this review has worked between 2017 and 2019. They write on institutional changes and partnership-based governance at Kyiv National Economic University (named after Vadym Hetman). Valentin Usov, Tetiana Petukhova, Volodymyr Chernykh and Viktoriia Kozak author chapter 9, on the implementation of cooperation and partnership in the training of teachers of vocational and technical education at South Ukrainian National Pedagogical University (named after K. D. Ushynsky). Chapter 10 is authored by Mykola Dmytrychenko, Nataliia Bondar, Oleksandr Hryshchuk, Khalidakhon Bakhtiyarova and Lesia Shevchuk, who address the use of new approaches based on partnership in training vocational teachers, in this case in the sector of transport, at the National Transport University. Like the previous three, chapter 11 describes and details a fourth experience of the development of partnerships in governance in the education of VET teachers, this one written by Olena Kovalenko, Nataliia Briukhanova, Liudmyla Shtefan, Tatiana Bondarenko, Hanna Korniush and Nataliia Korolova, who explain how they have established excellence in vocational education teacher training at the Ukrainian Engineering Pedagogics Academy.

Part III in the volume consists of two chapters that provide the scope of VET teacher education in Ukraine nowadays. Chapter 12 is authored by Valentyna Radkevych, Viktoriia Kruchek, Mykola Pryhodii and Daria Voronina-Pryhodii, discussing standards in vocational teacher education in Ukraine and the problems, conflicts and debates that come with their implementation. Chapter 13 is written by Oleksandr Kupriyanov, Tetiana Bondarenko, Halyna Yelnykova, Denys Kovalenko, Roman Nesterenko and Tetiana Ruslanova, and it deals with the role of civil society and the arrangements for policy dialogue in vocational education and training. Both chapters in this section look towards future developments of VET teacher education in the country once war is over, in the expectation of VET contributing to the social and economic progress of Ukraine.

Reading a book published in 2024 on vocational education in Ukraine undergoing the Russian invasion is highly motivating and the expectations to find out how the VET

system is able to contribute to sustaining a country's production and economy as well as the education of current and future generations are also very high, even if the topics are governance of the teacher education of vocational educators and, therefore, not directly the functioning of the VET system but the preparation that takes place in different universities of teachers who have not joined the system yet.

The answer to the appeal raised by these circumstances is found mainly in section III of the book, and here it is where my review begins.

2 Landmarks in VET Teacher Education in Ukraine

Part III of the book covers Ukrainian VET teacher training 'in a broader context', entailing two chapters. The first of them deals with standards (and therefore internationalization possibilities), and it is probably the chapter where tensions and problems are mentioned in a clearer way. The final chapter of the book is on policy dialogue on VET, disguised under the title of civil society. I comment on these hereafter.

Standardization is often related to quality and governance, not necessarily to partnerships which, as addressed in part II of the book, are due to local rather than national grassroots. References to standardization in chapter 12, however, are presented in such a way as if it were a synonym of Europeanization, as if standards were required as part of the process to approach the European Union, trying to work towards recognition. No clear mention is done to the fact that education policies, including higher education, are subject to the subsidiarity principle inside the EU. Standardization is also connected to the competencies of VET teachers, though there is no reference to their identity, that is not only related to teaching practice but also to the occupational branch of their professional domain, which proves to be much harder to standardize, because professional groups and communities of practice escape the temptation of homogeneity by differentiating themselves inside and across different countries. Most of the literature employed in the chapter is mainly Ukrainian, while more use of international references might have been possible on topics such as procedures, classifications, outcomes (and competitiveness and productivity), recognition and accreditation of knowledge. The debates raised by the chapter are relevant in VET policies as well as in vocational education teachers training.

Does standardization offer the opportunity to simplify procedures, or to make existing ones more complex? Standardization is presented as something inevitable, unquestioned, as if good VET teaching practice could not be done without standards. It is also relevant that, in the conclusions, the authors point to difficulties in standardization processes due to the lack of involvement of employers, and this might be addressed as part of the central topic of the book: what are partnerships for and what are the difficulties they must face.

The final chapter draws on policy dialogue in VET, another crucial issue when it comes to governance and partnerships. There is a discussion over centralized and decentralized state intervention, but the explanation of relations among regions, municipalities and national government does not clarify whether regions take over the role of the state and recentralize educational policies, while the civil society, mentioned in

the title, remains in the backstage. The notion of civil society may be misunderstood, as the agents mentioned are in fact institutions like professional association, trade unions and the Ukrainian educational research association. The impression it gives is that these civil society representatives are in fact internal actors of the system properly organized, rather than the civil society itself – even though there is reference to international charities and funds. It cannot be easy to address the role and extent of civil society while the nation is at war, the army has mobilized a large amount of the active population and there has been a very high rate of migration into other countries. Civil society is neither only nor even mainly about funding, but rather about participation and citizenship, as well as engagement as the local level, playing a relevant role in democratization processes. Civil society does not necessarily mean private actors and market forces counteracting the role of the State. In this sense, the extent to which the support provided by international NGOs to promote the expansion of project-based learning could be explained in more detail, as well as its relevance. In a similar way, the authors position the Ukraine education system as properly aligned with the UNESCO strategy 2022–2029 and with the Ukrainian 'Concept of the State Targeted Social Programme for the Development of Vocational Education for 2022–2027'; including attraction of international partners; however, some of these movements seem more an expansion of market driven forces than an increasing weight of civil society in the ownership and management of education.

The chapter is highly informative as well as clarifying on the current situation of education in the country under war, though not only vocational education, but also adult education, dual higher education and secondary education. Special mention deserves distant education, for which the Covid-19 lockdown and the subsequent distance education seem to have prepared the Ukrainian system for reacting to such a distressing event as the Russian invasion.

The chapter finishes with reference to two of the achievements of the PAGOSTE consortium: First, the launch of an association of vocational and lifelong education development, a public union which is very young and recent but claims to be a successful example and perhaps a valuable actor in the post-war reconstruction of Ukraine, despite its limited scope so far and its composition through individual rather than institutional membership. Second, the example of the social partnership in the field of VET in the region of Kharkiv, strongly hit by the war. The questions raised by both examples are amongst the main contributions of the volume.

Having made clear that the most appealing part of the book is the final one, there is no doubt that the core of the volume remains in part II, where four examples of developmental practice resulting from the PAGOSTE Erasmus actions are described, contextualized and in some cases researched by the authors of the chapters who may also be the actors of those developments in their own universities. If this were the case, I dare to express a concern about these chapters being written as success stories where problems, obstacles, difficulties, resistances, tensions and failures are hardly mentioned, as if reform in education, also in higher education, might proceed unimpeded. Even the concluding sections of these four chapters, like in the first part of the book, are short and in some way self-referential, instead of relating the experiences of each of the universities to broader frameworks or explanatory models.

Here I find one of the major gaps in the volume, that there is no theoretical common explanation nor framework of what is understood by partnership-based governance, in a way that facilitates understanding that all experiences narrated in the volume are examples of this even if they consist of very different aims, structures, actors and scopes. The editors of the volume might have provided such a framework that remains now a task for the reader, whose challenge is to develop a joint understanding of the usefulness and desirability of partnerships in the governance of vocational education teachers training and the role of higher education institutions in promoting such partnerships. One wonders whether these will be sustainable once the PAGOSTE funding is finished.

Chapters 8 to 11 exemplify four different experiences of developments in Ukrainian higher education institutions in charge of the education of VET teachers. Each of these innovative experiences can be read independently, and they are explained in such a way that even the structure of the chapters does not share a common guideline. Although all of them refer to the PAGOSTE frame, which might have deserved a chapter of its own, they describe curriculum changes, surveys, legal developments and internal specificities of each of the universities in very descriptive ways. Some of these chapters hardly use academic references and they differ in style, structure, extension and content provided. Nevertheless, all of them provide good descriptions of the implementation of the PAGOSTE ideas, in some cases addressing partnership issues directly, like chapter 9, while in others not taking them as the axis of the experience, like chapter 8. Chapter 10 outstands in reference made to the Russian military aggression, that is left aside in the other chapters; while it is also the chapter where more information on PAGOSTE is facilitated. Again, this might have been a chapter of its own before explaining each of the innovations happening in these higher education institutions, therefore simplifying the effort of the reader, who must reframe every chapter of this section. Furthermore, this missing chapter might have also provided a theoretical background for partnerships as well as on how governance is understood.

At the end of this part of the book, the reader is clear about the great satisfaction that participants have with the Erasmus+ project 'New mechanisms of partnership-based governance and standardization of vocational teacher education in Ukraine (PAGOSTE)'. Yet there are no hints on either critical reflection of what might have been done better in the project, lessons learned from other project partners, or how to proceed to make the achievements of the project sustainable along time, once the project funding finishes.

Mentioning resistances and difficulties might also be worth when debating each of the cases, all of which seem to have been successful and productive. Implementation of changes and reforms in other VET-related contexts is often complex and faces problems of different kinds.

Several chapters in part II refer to the legal framework affecting quality in higher education, on general education and on vocational education. This might perhaps have been a good idea for another chapter of its own. Likewise, a chapter or a section with an overview of the different universities in which innovations described in section 2 happen could have provided better context for these contributions. Another additional contribution might have addressed contrast of the extent to which there have been similar developments and where there have been differences among all four higher education institutions.

3 A Kaleidoscope on VET and VET Teacher Education

This review started by commenting on part III of the book, which explains the current situation and the expectations about the contribution of an improved VET through VET teacher education, closer to the societal needs, for a post-war Ukraine; and then on part II, covering how four higher education institutions are making efforts to develop partnerships even under a war context. I now turn to an overview of part I of the volume, which focuses more on VET than on the governance of VET, perhaps assuming that partnerships improve the quality of governance. However, the manner and extent to which this occurs are not explained in the volume.

The chapters in this part of the volume present VET in Switzerland, Australia, England, New Zealand, Germany and Austria, while there is a chapter from Italy on lifelong learning rather than VET. This part of the book, being highly informative, is difficult to connect to the rest of the volume and authors seem to have enjoyed a great freedom in writing their contributions, while a greater effort on the side of the editors might have improved the coherence of the section as well as its relation to the rest of the book. The impression is that each chapter can be read independently, that there are no connections across chapters and that this part, which provides a context of international examples, is not used as a contrasting element for any of the experiments and innovations presented in part II. Even in some cases, the content of the chapter is rather on the presentation of the VET system of the country than on vocational education teachers training or the underlying governance system. One wonders what the criteria are behind the choice of countries in part I and why they are relevant or exemplary for any of the cases of the Ukrainian innovations, and why they are described and analyzed in part II, and whether these countries, that represent different collective and liberal skill formation systems, might act as a reference, reflex or appropriate contrast for the Ukrainian case. Perhaps a chapter in this part addressing specifically the case of Ukraine and its governance in vocational teacher education would have contributed to make more sense of the other chapters as well as to frame contributions in part II of the volume.

4 A Final Remark and Concern

Having read the volume, this reviewer would have appreciated a clear definition or setup of a common framework on partnership-based governance, which is the topic of the book. Such a chapter would have provided an overarching scope for the different parts of the book, that currently remain independent and separate. Such a *fil-rouge* would have also framed better the different chapters in each of the parts, particularly in part II, with a clarification of what is the role of universities and their contribution to governance of VET and to promoting partnerships among different stakeholders involved in the education of vocational education teachers in different occupational domains, those of the specialization of the Ukrainian universities.

Similarly, a justification of why the countries and the approaches in the different chapters of part I might contribute to find a clear thread in the volume, and to better understand in which ways contributions in part I enrich the foundation, understanding

and developments of the experiences in Ukrainian universities detailed in part II. That is what I miss, as well as an introduction to each part of the volume and a more thorough explanation of the relation among the three parts that shape the book and the message that the volume intends to deliver. Perhaps parts of the chapter on vocational teacher education in Germany might play this role, given the explanation provided in section 4.1 on a theoretical perspective on governance. However, in order to play that role, that chapter would deserve a more prominent position in the book. Its absence may explain why even the dimensions and modes of governance are not referred to in other chapters, neither in part I nor II of the volume.

The overall recommendation I dare to make is to read the book looking for country specific information in the case of part I and for detailed description of innovations in part II, hence looking for specific details on countries (part I) or experiences and innovation (part II) rather than for a common overview of VET (and VET teacher education, and the governance of VET teacher education, and partnerships in VET teacher education) in Ukraine and other countries of the world. My advice to the reader is also to approach the book without the expectation to go through all of the chapters; at least in my case, the volume works better as a compilation or collection of contributions than as an edited volume. In this sense it is valuable and worth reading, and, as said at the beginning of the review, with greater and particular interest in part III, where both chapters are better contextualized in a post-Covid-19 and during the Russian invasion process. Not an easy task to work on a development project and to write an academic volume while your country is suffering the aggression of a foreign empire, for which I show my appreciation for the editors and particularly authors of chapters in parts II and III.