

**Conceptions of Connectivity: How Swiss Teachers, Trainers and Apprentices Perceive Vocational Learning and Teaching Across Different Learning Sites**

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Conceptions of connectivity: How Swiss teachers, trainers and apprentices perceive vocational learning and teaching across different learning sites.

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## **Abstract**

The integration of learning across different learning sites is an important and challenging task for each vocational education and training system. Although various integrative teaching and learning models have been developed and many reforms have been undertaken, their implementation is complicated by several factors. In particular, individual ways of understanding the relationship between the learning sites could be considered filters that may potentially influence the communications and actions of protagonists in this learning context. This study aimed to explore different ways of conceptualising learning and teaching across learning sites in the Swiss vocational education and training system. Semi-structured interviews were conducted with 26 vocational school teachers, company trainers and apprentices in apprenticeship programmes in industry and business and administration in the Canton of Tessin. Data were analysed by combining data-driven (phenomenography) and theory-driven (content analysis) text analysis procedures. By adopting a phenomenographic method, four ways of conceptualising vocational learning across multiple learning sites were found: as separate learning experiences, as complementary learning experiences, as experiences mediated by intercompany training centres and as experiences integrated at the school level. Content analysis showed qualitative differences among the conceptions in relation to what extent they included socio-cultural key claims of school-workplace connectivity. Conclusions regarding potential implications for teachers, trainers and apprentices are drawn, and suggestions for future research are made.

**Keywords:** school–workplace connectivity; vocational learning and teaching; multiple learning sites; phenomenographic method

## **Integrating vocational learning and teaching across different learning sites: the potential role of individual conceptions**

The integration of learning and teaching across different learning sites, frequently termed ‘connectivity’ by contemporary scholars (e.g., Stenström and Tynjälä 2009; Tuomi-Gröhn and Engeström 2003; Griffiths and Guile 2004), constitutes an important yet challenging task for each vocational education and training (VET) system at different levels (micro, meso and macro). In particular, many VET researchers (e.g., Akkerman and Bakker 2011; Schaap et al. 2012; Rauner and Smith 2010) consider these challenges specifically pertinent at the level of concrete learning and teaching. Although various integrative teaching and learning models have been developed (e.g., action-oriented, problem-based and situated) and several reforms have been undertaken (e.g., the development and implementation of competence-based curricula), the alignment of what is actually happening at this level in different learning contexts is not always straightforward and still poses unresolved problems. Looking at the evidence from existing research (e.g., Hardy and Parent 2003; Akkerman and Bakker 2012; Fuller and Unwin 2011), it seems that even in formalised apprenticeship programmes, there is often little reciprocal acknowledgment—let alone coordination—of learning goals, contents, methods and assessments. Consequently, apprentices still perceive challenges and sometimes even unresolved contradictions between what they learn at school and what they experience in the workplace, and they often get no help in integrating the two learning experiences (Schaap et al. 2012; Stenström and Tynjälä 2009; Akkerman and Bakker 2012). However, as empirically shown by Virtanen et al. (2012), the opportunity to perceive integration between learning at school and in the workplace is an important support for students’ learning.

As shown by an extensive literature on apprenticeship (see, for example, Rauner and Smith 2009, 2010; Akkerman and Bakker 2012; Fuller and Unwin 2011; Stenström and Tynjälä 2009), many factors do contribute to promote or to obstruct effective connection between learning at school and in the workplace. Among others, the following aspects were identified as supporting an effective apprenticeship: the degree of coordination and collaboration between the various bodies involved in the VET system at the macro institutional level (Hardy and Parent 2003), the quality of VET curricula in relation to the new demands of the labour market (Deissinger 2004; Griffiths and Guile 2004; Rauner and Smith 2009), the development of integrative pedagogical approaches (Schaap et al. 2012; Tynjälä 2008) and the ability of teachers and trainers to guide and support apprentices effectively (Harris et al. 1998; Filliettaz 2010; Akkerman and Bakker 2012; Baartman and Bruijn 2011).

However, it is reasonable to suppose that the effective implementation of these factors might be influenced by how involved individuals conceive the functioning of learning and teaching across school and workplace.

Two strands of studies inspired us in developing this idea. First, scholars who argue from a socio-cultural perspective in particular (e.g., Stenström and Tynjälä 2009; Tuomi-Gröhn and Engeström 2003; Akkerman and Bakker 2012; Griffiths and Guile 2004; Tynjälä 2008) stress that any successful integration of learning across the different learning sites requires the key actors (teachers, students and workplace supervisors) to explicate, negotiate and possibly reconcile their conceptions of their roles and responsibilities as well as their reciprocal expectations. From this perspective, various authors from different areas of studies (including work-based learning,

vocational higher education and secondary VET) have emphasised the need to base those negotiations and collaborations on adequate integrative and connective-oriented models of vocational teaching and learning (Tynjälä 2008; Griffiths and Guile 2004). This assumption is nurtured by contemporary theoretical and empirical investigations from different research fields, such as cognitive psychology (e.g., Gardner 2006), organisational learning (e.g., Senge 1999) and pedagogical innovation management (e.g., Euler and Seufert 2005), all of which stress that one of the most important factors that can foster or hinder successful implementation or change is how involved parties conceive of the issue at hand because these conceptions influence not only how people process and interpret information but also how they subsequently communicate and act.

A second line of argumentation stems from educational researchers who adopt a phenomenographical perspective. Here, the investigation of individual conceptions has also become very prominent, especially since the pioneering studies conducted at the University of Gothenburg (e.g., Säljö 1979; Marton 1988) revealed their powerful effect on students' approaches to learning and consequently on their learning outcomes. More recently, this line of research has been extended to studies of how teachers' approaches to conceptualising teaching and learning influence their teaching and how this affects students' learning (e.g., Paakkari et al. 2011). In particular, scholars who adopt a phenomenographical view have identified different general conceptions of learning, hierarchically ordered on the basis of the increasing awareness they imply in terms of the multifaceted, interactive and complex nature of the learning phenomenon (e.g., Säljö 1979; Marton 1988; Paakkari et al. 2011). From this perspective, it has been shown that conceptions that are higher in a hierarchy make teachers more likely to adopt effective teaching approaches, with consequent influence on students' learning approaches and outcomes (Kember and Kwan 2000; Trigwell and Prosser 1996). Similarly, students with conceptions that are higher in a hierarchy are more likely to adopt effective learning approaches and increase their learning (Cano and Cardelle-Elawar 2004; Eklund-Myrskog 1997).

Although these approaches legitimise the consideration of conceptions of connectivity as a possible precondition for effectively implementing integrated programmes of vocational training, studies that address the role of individual conceptions in VET are scarce. Two exceptions are Eklund-Myrskog's (1997) study in Finland and Wesselink et al.'s (2010) study in Holland. Nevertheless, these studies focused on aspects of vocational learning that differ from our specific point of interest. Eklund-Myrskog explored conceptions of learning within a group of vocational students. The object of the study was a general definition of learning, without specifically considering how it develops across learning sites. Wesselink et al. examined the concept of school-workplace connectivity from students', teachers' and company trainers' points of view, focusing on specific aspects of competence-based education (authenticity, self-responsibility and the role of expert and coach).

The study we present in this paper adopts a more comprehensive focus on vocational learning and teaching across learning sites. The main point of the investigation is how teachers, trainers and apprentices conceive vocational learning and teaching across school and work sites. Finally, a socio-cultural approach to the integration of school- and work-based learning offered us the basis for developing the conceptual framework of the study.

## **Conceptual framework: a socio-cultural view of vocational learning and teaching across learning sites**

In recent decades, the integration of vocational learning and teaching across different learning sites has been the subject of a rich body of theoretical and empirical scientific literature, especially from scholars who adopt a socio-cultural perspective to investigate school–workplace connectivity in secondary or tertiary VET programmes (Griffiths and Guile 2004; Stenström and Tynjälä 2009; Tuomi-Gröhn and Engeström 2003; Akkerman and Bakker 2012; Tynjälä 2013). From this perspective, various conceptual models have been proposed. Some of these models deal with the development of pedagogical approaches that seek to integrate school- and work-based learning effectively (e.g., Tynjälä et al. 2006). Others focus on institutional aspects of promoting partnership and collaboration between actors in different learning contexts (e.g., Guile and Griffiths 2001). In addition, various constructs (such as ‘competence’, ‘transfer’ and ‘integration’) as well as different dimensions of the learning process at school and in the workplace have been progressively elaborated as fundamental arguments of those models. Integrating these various aspects of the socio-cultural perspective, we have chosen the following three claims as key conceptual assumptions of our study:

1. *Nature of vocational learning and teaching:* Vocational learning and teaching should be conceptualised in a competence-oriented way, overcoming the traditional dualistic view of theoretical and practical learning as well as the subject-oriented conceptions of school learning. According to this perspective, competence is viewed as the potential to generate effective actions to cope with the demands of specific situations. This potential is based on the availability, activation and interplay of learnable individual dispositions such as different kinds of knowledge, skills, motivational orientations, attitudes and values (Eraut 2004; Baartman and Bruijn 2011; Wesselink et al. 2010; Tynjälä 2008).
2. *Nature of the transfer process:* The transfer of what is learnt at school to the workplace is not automatic, mechanical or unproblematic. On the contrary, it implies complex processes of ‘recontextualisation’ (Van Oers 1998) and of continuous ‘transformation’ (Beach, 2003), in which knowledge is generated across social activities rather than simply transferred from one situation to another (Griffiths and Guile 2004; Middleton and Baartman 2013). According to this perspective, learners need to be supported to transform their knowledge and skills to make them applicable to the different context-related situations (Griffiths and Guile 2004). In addition, they should be helped to develop their ability to understand both differences and similarities among situations and tasks (Middleton and Baartman 2013; Marton 2006) to re-contextualise similar activities successfully into different contexts (Griffiths and Guile 2004).
3. *Nature and direction of the association between learning at school and in the workplace:* An integrated and bidirectional process of connection between learning experiences at school and in the workplace should be promoted. In this view, vocational learning and teaching are conceived as iterative processes that occur at the boundaries of different socio-cultural contexts of learning and practices, that is, schools and workplaces (Tuomi-Gröhn and Engeström 2003; Griffiths and Guile 2004; Tynjälä 2008; Akkerman and Bakker 2011). Assuming that this perspective is correct, students’ experiences in the workplace should be considered an integrative part of the vocational learning process.

An additional aim of our study is to investigate the extent to which teachers', trainers' and apprentices' ways of conceptualising vocational learning across learning sites include these key assumptions.

## **Research context and method**

### ***Context***

The study presented in this article is part of a larger project whose aim is to enrich understanding of vocational learning across different learning sites to develop strategies and tools for improving it. One goal of the project is to analyse whether and how individual ways of conceiving the relationships between learning sites can foster or hinder the effective implementation of an integrated learning and teaching approach and, consequently, influence students' development of vocational competence. This study lays the foundation for the broader research effort by identifying a set of conceptions to be further validated and more systematically analysed through the use of questionnaires.

In this framework, the present contribution aims to investigate individual conceptions of vocational teaching and learning in multiple learning sites among teachers, trainers and apprentices involved in the dual-track initial VET programme in Switzerland.

Compared to other European countries, Switzerland appears to be characterised by the higher percentage of young people enrolled as apprentices in initial vocational training. After completing compulsory education at the lower secondary level, about one-third of Swiss students move on to the VET system, and 80% of them attend apprenticeship programs. Apprentices spend one or two days per week at school; during the rest of the week, they work at the company where they receive their on-the-job training. Within training companies, learners are supervised by qualified and skilled workers with specific professional expertise, although usually with limited pedagogical training (see Fillietaz 2010). To reinforce the interaction between vocational school and training companies as well as to support companies to address their training aims, a third learning site is foreseen within the Swiss VET system: intercompany training centres maintained under the auspices of the Organizations of the World of Work, the trade associations representing each sector. Intercompany training centres provide additional professional courses (referred to as intercompany or cross-company courses) that apprentices attend usually once or twice a year. All three learning sites are regulated by federal and cantonal provisions. In particular, the Federal VET Act (LFPr 2002) defines the role of the three learning sites as follows: schools provide general cultural and vocational knowledge, companies offer practical vocational training and intercompany centres complete practical and scholastic training. The generic nature of this description leaves enough space for individual conceptions of vocational learning and training across learning sites to develop. Thus, heterogeneous views of different key actors in the Swiss VET system are expected (for more details on the Swiss VET system, see Stalder and Nägel 2009; OECD 2008).

## ***Research questions***

Two research questions oriented this study:

1. How do key actors in the Swiss VET system (vocational school teachers, company trainers and apprentices) conceptualise vocational learning and teaching across the learning sites (schools, companies and intercompany centres)?
2. To what extent do their conceptions include key aspects of a socio-cultural view of vocational learning and teaching across learning sites?

To provide preliminary answers to these questions, 26 interviews were conducted with vocational school teachers, company trainers and apprentices in the Italian-speaking part of Switzerland (Canton of Tessin).

## ***Sample***

The sample was composed of 10 vocational school teachers, eight company or intercompany trainers and eight apprentices involved in the initial dual-track VET programmes (see Table 1). The participants were equally distributed into two professional fields—the field of business and administration (commercial employees) and the industrial-mechanical field (mechatronic technicians and polytechnicians).<sup>1</sup>

Table 1. Distribution of the participants by role and vocational field. Frequency values

	Industrial-mechanical	Business and administration	Total
Teachers	5	5	10
Trainers	4	4	8
Apprentices	4	4	8
Total	13	13	26

As recommended by phenomenographic scholars (Åkerlind 2005a), the sampling was guided by criteria of heterogeneity. In addition to the vocational field and to the three different roles of participants in the VET system, our sample was heterogeneous with respect to gender (12 females and 14 males) and the size of the companies offering apprenticeships (17 small companies and nine medium-sized to large ones). The subjects were contacted directly and individually by the interviewer, and they voluntarily agreed to participate. The interviewees were connected in the sense that, for each apprentice, we contacted one of his/her company trainers and at least one teacher from his/her vocational school. Throughout the first contact, the interviewer informed the participants about the aims and methods of the study. In addition, participants' questions or doubts

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<sup>1</sup> These profiles were selected because they are very common in Tessin but also very different from each other in terms of both gender dominance (commercial employee courses are typically attended by females, while technical professions are primarily chosen by males) and their tasks and other characteristics (business and administration largely concerns symbolically mediated activities, whereas industrial-mechanical jobs require more psycho-motor activity).



about the study or their participation in the study were discussed. That first phase of contact and exchange helped us to reduce possible sceptical views of the participants and consequently build a climate of collaboration and trust.

### ***Data collection***

Data were collected through individual semi-structured interviews. The interview questions were intended to stimulate descriptive, narrative and argumentative discourses. The same questions were asked to all groups of interviewees (i.e., apprentices, teachers and trainers). In particular, three kinds of questions were asked:

1. *Direct questions* dealing with the conceptions of vocational learning and teaching across learning sites were asked first—for example, ‘Can you describe how vocational learning and teaching occur or should occur, in your opinion, across the different learning sites?’
2. To stimulate rich discussions, *counter-factual questions* were added—for example, ‘In your opinion, would it be possible to learn this specific job without attending a vocational school? Or without experience at the workplace? What would happen if one of the learning sites did not exist?’
3. Finally, *general and indirect questions* were used to stimulate narratives on the interviewees’ direct experience of teaching and learning across learning sites—for example, ‘How does your learning occur in these different sites? How is your teaching influenced by the existence of the other learning sites?’

The average length of the interviews was one hour. All interviews were audio-recorded and transcribed verbatim.

### ***Data analysis***

The interview data were examined by combining data-driven analysis and theory-driven analysis in a sequential way.

The first phenomenographic method was applied to answer the first research question (Marton and Booth 1997; Åkerlind 2005a, b; Paakkari et al. 2011). Phenomenography consists of a qualitative data-driven method of text analysis that has been adopted frequently in investigating individual conceptions, especially in the educational field (Säljö 1979; Marton 1988; Paakkari et al. 2011; Paloste et al. 2011). The main aim of this procedure is to bring to light the qualitative differences in how people understand and experience a specific phenomenon. The main result of a phenomenographic analysis (so-called outcome spaces) is a set of individual conceptions that are hierarchically ordered in terms of complexity and on the basis of specific structural aspects.

As showed by Harris (2011) phenomenographers have developed two frameworks to enhance the study of conceptions, i.e. the what/how framework and the referential/structural framework. In this study we adopted the referential/structural framework to analyse data (see Marton and Pong 2005; Pang et al. 2006). In this perspective, conceptions are presented in descriptive categories that include referential and structural aspects. Referential aspects are the synthetic descriptions (here called synthetic categories) of the different ways of understanding the phenomenon of study.

Structural aspects represent analytical differences between the different conceptions (here indicated as analytical categories of variation), usually organised around a few key dimensions (here referred to as themes of variation) (see also Paakkari et al. 2011). More specifically, we carried out the following steps of analysis:

- Answers to questions were extracted from each interview transcript and became the textual basis of our analysis.
- Selected passages were read several times to develop a first draft of different views of vocational learning and teaching across learning sites as they emerged from participants' discourses. At this phase, different views were presented at a general level.
- The next step aimed to identify in more detail similarities and differences among the emerging preliminary conceptions. From a phenomenographic perspective, we considered these aspects as the structural features that allowed us to capture and describe the core qualitative differences among conceptions. Similarities and differences were investigated by focusing on semantic expressions adopted by the participants. To reach a higher level of accuracy in interpreting qualitative differences between conceptions, the researchers' attention continuously and iteratively shifted from specific utterances to the large chunks of transcription they were part of. The product of this step consisted of the so-called outcome space where synthetic categories of conceptions were presented in relation to the themes of variation. The themes of variation oriented us to regard some conceptions as more complete and complex than others. On the basis of these considerations, we organised conceptions in a hierarchical and inclusive way.
- Finally, each participant was assigned the conception that dominated in his or her discourse.<sup>2</sup>

Two primary researchers were involved in this phase of data analysis. A dialogic reliability check was first adopted 'where agreement between researchers is reached through discussion and mutual critique of the data and of each researcher's interpretative hypothesis' (Åkerlind 2005b, p. 331). The identified conceptions were then subjected to an inter-coder reliability check (see also Cope 2004) by involving a third independent researcher. This procedure was applied with respect to both the analytic categories of variation—these constitute an analytic articulation of each theme of variation—and the synthetic categories of individual conception. The following three steps were followed (for details, see Aprea and Sappa in press):

- First, two independent coders (including one who had not taken part in the first phase of the analysis) coded each transcript using the identified analytic categories of variation as categories of analysis. The transcripts were divided into different units of meaning—large chunks of transcripts incorporating specific and distinct meanings about the phenomenon we were investigating—which were intended as units of analysis. A total of 174 units of analysis were coded.

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<sup>2</sup> As emphasised by Åkerlind, it is not an assumption of phenomenography that transcripts (individuals) 'necessarily correspond to one particular way of viewing the phenomenon, both in the sense that any one transcript may represent only a fragment of a view and also that any one transcript may represent more than one view' (Åkerlind 2005a, pp. 118-119). In line with this consideration, we assigned to each participant the prevailing (not necessarily unique) conception that emerged from his or her responses.

- Second, reconsidering each individual transcript as a unit of analysis, the two independent coders assigned to each participant the conception that prevailed in his or her discourse. A total of 26 units of analysis (corresponding to the total number of transcripts) were coded.
- Inter-coder agreement was calculated using the kappa statistic.

The second research question was answered by analysing the identified conceptions in relation to the key claims of our conceptual framework, that is a socio-cultural view of vocational learning and teaching across learning sites. A theory-driven qualitative content analysis was applied (Krippendorff 2013). The large chunks of transcription referring to each conception were re-analysed (secondary analysis) in order to identify how the following three aspects were treated by the participants: 1) nature of vocational learning and teaching; 2) nature of the transfer process; 3) nature and direction of the association between learning at school and in the workplace. Using this procedure, qualitative descriptions of the three key aspects for each conception were outlined. These descriptions were then compared with the key claims of our conceptual framework in order to define whether and how conceptions included a socio-cultural view of vocational learning and teaching across learning sites. The data analysis and interpretation were carried out by the two independent researchers, and a dialogic reliability check was applied (Åkerlind 2005b).

## **Results**

### ***First research question: individual conceptions of vocational learning and teaching across the different learning sites***

Four conceptions were identified that we labelled as follows (see Table 2): (1) separate learning experiences, (2) complementary learning experiences, (3) mediation by an intercompany centre and (4) school-centred integration. The identified conceptions differ from each other with respect to two themes of variation, namely the main aims attributed to each learning site and their perceived positions relative to each other. In addition, 18 analytical categories of variations were distinguished (numbered 1.1–2.8 in Table 1) to explain the different ways in which each theme was treated differently across the different conceptions. The analytic categories of variations oriented us to trace the inclusive hierarchical order among the conceptions. Moving from the first conception to the fourth one, the themes of variation were progressively described in a more complete and complex way by expanding the number of aspects included (for example, the aims attributed to each learning site increased from the first to the last conception) or by assuming a more comprehensive view of the phenomenon (for example, the learning sites' relative position shifted from a more simplistic and separate description to a more interrelated picture).

Table 2. Individual conceptions of vocational learning and teaching across learning sites and their structural features

Themes of variations and analytic categories of variations	Synthetic categories of individual conceptions			
	Separate learning experiences	Complementary learning experiences	Mediation through intercompany centres	School-centred integration
1. Aims attributed to each learning site				
Schools	1.1 Basis for further studies 1.2 Theoretical and subject-oriented	1.1 Basis for further studies 1.3 Integration of knowledge, capacity and attitudes	1.1 Basis for further studies 1.3 Integration of knowledge, capacity and attitudes	1.1 Basis for further studies 1.3 Integration of knowledge, capacity and attitudes 1.4 Reflective integration of school and workplace learning
Workplaces	1.5 Practical knowledge	1.5 Practical knowledge 1.6 Situation-specific knowledge and skills	1.5 Practical knowledge 1.6 Situation-specific knowledge and skills	1.5 Practical knowledge 1.6 Situation-specific knowledge and skills
Intercompany centres	1.7 Monitoring and evaluation 1.8 Supplementing practical knowledge and transversal skills	1.7 Monitoring and evaluation 1.8 Supplementing practical knowledge and transversal skills 1.9 Helping schools and workplaces achieve their aims	1.7 Monitoring and evaluation 1.8 Supplementing practical knowledge and transversal skills 1.10 Guiding apprentices to put into practice what was learnt at school	1.7 Monitoring and evaluation 1.8 Supplementing practical knowledge and transversal skills 1.10 Guiding apprentices to put into practice what was learnt at school
2. Learning sites' relative positions				
Schools	2.1 Separate	2.2 Complementary	2.2 Complementary	2.3 Integrated
Workplaces	2.4 Separate	2.5 Complementary	2.5 Complementary	2.5 Complementary
Intercompany centres	2.6 Separate	2.7 Supporting	2.7 Supporting 2.8 Mediating	2.7 Supporting 2.8 Mediating

The inter-coder reliability check for categorisation of the transcripts yielded kappa values of 0.86 ( $p < .001$ ) for the 18 analytic categories of variations and 0.68 ( $p < .001$ ) for the four conceptions. The next subsections detail the key structural features of each conception and then synthesise its general meaning, illustrated by extracts from the interviews. Interviewee names are pseudonyms.

### *Vocational learning and teaching across learning sites as separate learning experiences*

*Aims attributed to each learning site:* In this conception, vocational schools are primarily perceived as oriented towards providing a basis for further studies to obtain a diploma and possibly have access to tertiary education (see Extract 1). Theoretical, subject-related knowledge constitutes the main focus of teaching and learning at school. Participants who assume this conception discuss school functions by referring to the teaching of cultural and vocational knowledge, specific disciplines learnt at school (such as accounting, mathematics and history) and the theoretical nature of school teaching (see Extracts 2 and 3).

#### **Extract 1**

*School offers the opportunity to earn a diploma and then to continue your studies.*

(Silvia, female, apprentice, business and administration)

### **Extract 2**

*At school, we learn accounting, business and administration. . . . at school, there are disciplines like geography, history . . . those kinds of general things.*

(Enrica, female, apprentice, business and administration)

### **Extract 3**

*Actually, at school, there is the teaching of all disciplines.*

(Emma, female, apprentice, business and administration)

On the other hand, work experience is perceived as a realm of practical learning that makes it possible to learn everything relevant to practising the trade (see Extracts 4 and 5). Practical knowledge is seen as the main aim of learning and teaching in the workplace.

### **Extract 4**

*Here, you learn to work. . . . This has nothing to do with the school; here, you learn everything concerning the work practice.*

(Paola, female, apprentice, business and administration)

### **Extract 5**

*At work, we learn everything we do in a company. . . . at work, it is practice, and you can learn it only in the workplace.*

(Enrica, female, apprentice, business and administration)

Finally, the intercompany centres are described as aiming to monitor and evaluate apprentices' learning and to complete, if necessary, practical learning (for example, when an apprenticeship company cannot teach certain procedures that are not part of its routine). In addition, they are expected to support the development of transversal skills, such as communication and socio-relational skills (see, for example, Extract 6).

*Relative positions of different learning sites:* Participants who adopt this conception view each learning site as substantially independent of the others. They discuss the functions of each separately. References to connections between them are limited to the fact that participation in all three is normally required to earn the apprenticeship certificate. Each experience is deemed relevant and interesting in itself, but a joint objective and interaction between the sites are not conceived. In this view, the advantage of a multiple-track vocational training is mainly perceived as the opportunity it gives apprentices to work and study at the same time. This enriches their school and practical experiences and thus improves their employability (see Extract 6).

### **Extract 6**

*School and workplace . . . are two separate things . . . . School follows its own programme . . . at school, there are subjects . . . at the workplace, we learn everything we have to do in a company; we actually learn to work. . . .*

*In the intercompany courses, they teach us how we have to behave with the customers, how to answer the phone, something like that. . . . Students who attend only school . . . for them, it is more difficult to find a job than for us apprentices . . . because apprentices have both theory and practice.*

(Enrica, female, apprentice, business and administration)

These participants did not mention any strategies of communication between learning sites. Perceived discrepancies between what is taught at school and what is realised in the workplace are not questioned with teachers or trainers but seen as inevitable and ascribed to the fact that school and workplace are two separate worlds. From this perspective, teachers and trainers are perceived as legitimised in limiting their expertise to those aspects for which they are responsible. It is seen as normal that teachers do not know how different theory is from practice because their experience is

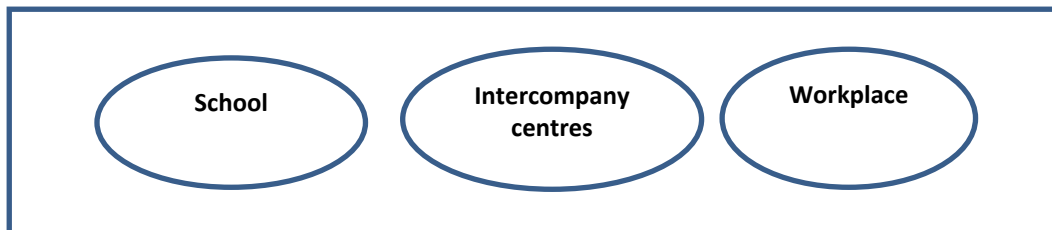
limited to their academic studies and they must exclusively refer to the formal school programme (see Extract 7). A connection with practical workplace experiences is simply not expected.

**Extract 7**

*Teachers teach in the same way they have learnt . . . they do not know what happens at work . . . they have to follow their programme . . . that's all.*

(Emma, female, apprentice, business and administration)

Figure 1. Vocational learning and teaching across learning sites as separate learning experiences



*Overall view:* On the basis of the structural aspects described above, we consider the first conception to represent vocational learning and teaching in terms of different and separate learning experiences at the three learning sites (Figure 1). This conception was shared by all four apprentices from the business and administration field and by one company trainer from the same field. Neither teachers nor apprentices from the industrial field shared this conception.

*Vocational learning and teaching across learning sites as complementary learning experiences*

*Aims attributed to each learning site:* The second conception holds a somewhat less restricted view of learning at school, enriched by a more complex and articulated description of learning in terms of knowledge (for example, knowledge of concepts and procedures as well as of materials), capacity (for example, being able to disassemble a car motor) and attitudes (for example, responsibility and professionalism) (see Extract 8).

**Extract 8**

*The school teaches the kind of knowledge you need for being a commercial employee, but school also teaches you to have an attitude towards work, to assume a professional attitude, to work in a group and to present yourself and your work to the public.*

(Angela, female, vocational school teacher, business and administration)

The aims of the workplace are also perceived from a more holistic perspective. They include the promotion of situation-specific knowledge and skills as well as the development of professional motivation and responsibility (see Extract 9). Companies are considered places in which content learnt at school can be contextualised and adopted to specific situational opportunities and constraints, such as time restrictions, customer needs, available instruments, and company procedures. Moreover, specific elements of expertise development are cited, such as learning to increase work speed by reducing the number of steps to be taken or by adopting ‘tricks of the trade’ (see Extracts 10 and 11).

### **Extract 9**

*In the workplace, they learnt to adopt themselves to each prevailing situation, to work simultaneously on several tasks. At work, they developed a real sense of responsibility.*

(Pia, female, vocational school teacher, business and administration)

### **Extract 10**

*When you start, school tells you, 'There is this machine . . . it works in that way' . . . You learn . . . and it is useful . . . , but then you start the practice and you do as you can.*

*At school, [teachers] teach you to identify the steel, and here, you have to be able to do that.*

*Then they [school and workplace] are synchronised.*

(Silvio, male, apprentice, industrial and mechanical trades)

### **Extract 11**

*School teaches you to be precise and meticulous and to realise the correct work procedure. . . . The company gives you the practical part. That is not only an exercise. Experience in the workplace exposes apprentices to the constraints of the real working life.*

(Roberto, male, vocational school teacher, industrial and mechanical trades)

Finally, in this conception, the main intent of the intercompany centre is seen as helping both schools and workplaces to achieve their specific aims. Intercompany centres are seen as supporting schools in developing a more practical approach to teaching (for example, developing company simulations—see Extract 12) and as assisting apprenticeship companies (especially the small ones) when their apprentices need additional theoretical or practical training (see Extract 13). The monitoring and evaluation function of the intercompany centre is recognised as well.

### **Extract 12**

*Last year, with the help of the intercompany course, we realised teaching activities that worked well. We have created small virtual companies . . . where students could get in touch with different things . . . and try out by themselves.*

(Pia, female, vocational school teacher, business and administration)

*Relative positions of different learning sites:* In this conception, schools and apprenticeship companies are seen as substantially complementary, particularly regarding the contents of the learning they provide, while intercompany centres assume a specific supportive role.

### **Extract 13**

*School, workplaces and intercompany courses—they all contribute to the apprentices' learning. They are all important. They are really complementary. . . .*

*At school, you learn the basis for becoming a commercial employee. . . . Here [in the workplace], you learn to be professional; experience at the workplace offers you the capacity to work. . . .*

*Intercompany centres are very useful since they teach a lot of things useful for our work. . . . we can ask the intercompany trainers to teach our apprentices what we need.*

(Silvia, female, company trainer, business and administration)

Knowledge, skills and attitudes taught at school are described as substantially aligned with those requested in the workplace, and apprentices recognise the relevance of school learning for their work. In addition, work-based learning is conceived as offering apprentices the opportunity to enrich their school-based knowledge and skills with a more situated and authentic perspective. Intercompany courses play an important additional role in reinforcing this complementarity.

Nevertheless, the described complementarity and the alignment of learning contents do not seem to achieve complete integration. Some discrepancies between how workplace procedures are taught

and applied in the two contexts remain unresolved. Students perceive these discrepancies as threatening the transferability of vocational school learning to workplace practice (see Extract 14). Teachers see them as proof that improper procedures are applied in the workplace (see Extract 15).

**Extract 14**

*For example, a technical drawing—at school, they insist on teaching us the manual procedure . . . it is true that manual drawing is useful . . . and they teach us to be meticulous—that is important. But here in the workplace, you finally do as you can . . . actually, practice is never like what you learnt at school.*

(Silvio, male, apprentice, industrial and mechanical trades)

**Extract 15**

*[Apprentices] sometimes told me, ‘They [the employers] told us the opposite of what you teach us . . . [referring to how to write a commercial letter]’, but I argued . . . the system we have adopted to teach correspondence is the same in all the cantonal business and administration schools—that is, in order to have a sort of coherence between schools . . . we are the ones who make the examinations . . . I gave them a document where I indicate exactly everything with respect to how a commercial letter should be structured . . . because there are some rules to be respected . . . there are some basic things [the apprentice has] to know.*

(Pia, female, vocational school teacher, business and administration)

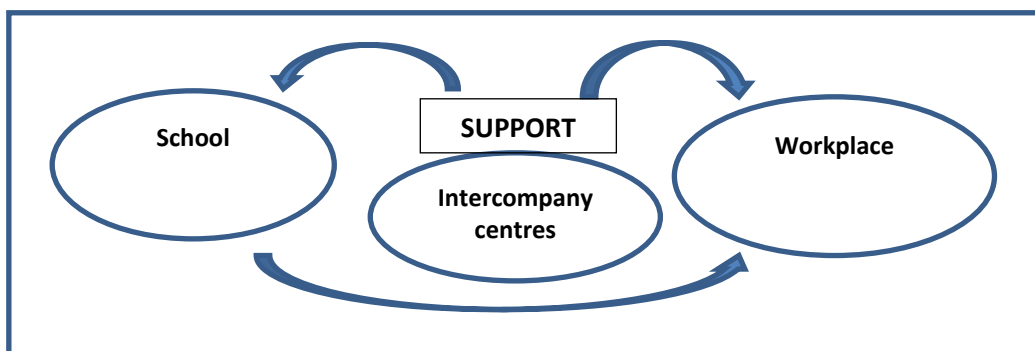
In this conception, neither the school nor the apprenticeship company or intercompany centre assumes the role of integrating these discrepancies or problematising the process of transferring knowledge and skills. The task of integrating those aspects seems instead to be attributed to the apprentices themselves (see Extract 16).

**Extract 16**

*So school invariably remains a separate context. It is a different world. Here at school, you have to do accounting in a specific way; you as a student have to be flexible.*

(Caterina, female, vocational school teacher, business and administration)

Figure 2. Vocational learning and teaching across learning sites as complementary learning experiences



*Overall view:* In this view, complementarity is primarily based on the perceived correspondence of learning contents at school and in the workplace. Vocational school learning is seen as providing the basis of knowledge and skills to be transferred to the workplace. The workplace further reinforces apprentices’ vocational learning by providing situation-specific vocational knowledge and skills. The intercompany centres play an additional supportive role by separately helping schools and apprenticeship companies to reach their respective and complementary aims (Figure 2).

This conception was shared by nine respondents. Six came from the business and administration field. Six were teachers, two were company trainers and only one was an apprentice.



*Vocational learning and teaching across learning sites as mediated by intercompany centres*

*Aims attributed to each learning site:* In the third conception, aims attributed to schools and apprenticeship companies remain substantially the same as in the second conception, but the functions attributed to the intercompany centres qualitatively change. Specifically, guiding apprentices as they transfer what they learnt at school to the workplace ('putting into practice'; see Extracts 17, 18 and 19) is an additional aim attributed to the intercompany centres.

**Extract 17**

*In the intercompany courses, I present all the stages of a procedure, step by step . . . I teach students how the procedure works. In the intercompany courses, we teach putting into practice what you learn theoretically at school.*

(Francesco, male, intercompany trainer, industrial and mechanical trades)

**Extract 18**

*With respect to the school and to the workplace, the intercompany centres are in the middle. It is their task to guide apprentices to put into practice what is learnt at school.*

(Vittorio, male, intercompany trainer, industrial and mechanical trades)

*Relative positions of different learning sites:* In this conception, schools and workplaces continue to be complementary, but it emphasises a mediating role for the intercompany centres. Interviewees used terms such as 'mediate', 'middle', 'guiding' and 'connection' (see, for example, Extracts 18 and 20) to describe the actions and functions of the intercompany centres. This mediation function is described in terms of improving apprentices' ability to put what they have learnt at school into practice in the workplace. In this perspective, intercompany centres give apprentices the opportunity to connect the complementary but separate teaching aims of the school and the apprenticeship company.

**Extract 19**

*At school, you learn all the basics you need. In the workplace, you can have practical experience . . . the real practical side of the everyday work experience. And in the intercompany courses, you deal with putting this [what you learn at school] into practice.*

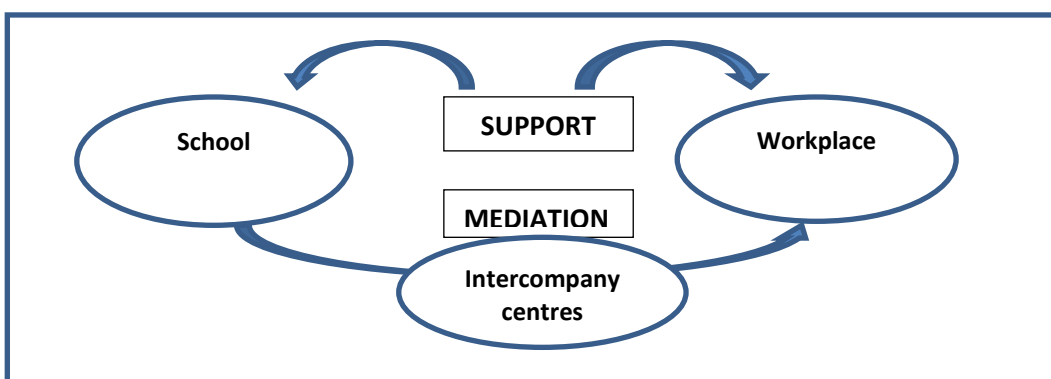
(Cristiano, male, vocational school teacher, industrial and mechanical trades)

**Extract 20**

*Intercompany courses really connect it all. At school, I explain to the apprentices how many kinds of rice exist and their differences. In the workplace [as a shop assistant], you can see that they are present and you meet customers who ask for them. . . . At the intercompany centre, trainers show you what could be done with these different kinds of rice.*

(Cecilia, female, vocational school teacher, business and administration)

Figure 3. Vocational learning and teaching across learning sites as mediated by intercompany centres



*Overall view:* The key element of the third conception is its attribution of a mediation role to the intercompany centres. Discrepancies between procedures taught at school and those applied in the workplace are not specifically discussed; rather, mediation by the intercompany centres seems to primarily focus on the need to make what is learnt at school more practical (Figure 3).

Six interviewees expressed this conception. Four were from the industrial field. Four were company or intercompany trainers, one a vocational teacher and one an apprentice.

#### *Vocational learning and teaching across learning sites as integrated by the schools*

*Aims attributed to each learning site:* The main feature of the fourth conception is the fact that reflective integration of school and workplace learning is included in the aims of the school. The relationship between school learning and workplace practice is discussed (see Extracts 21 and 23), and discrepancies are used as a means to further develop knowledge and skills (see Extracts 21 and 22).

##### **Extract 21**

*When we enter the classroom, the teacher asks each of us, 'How are you? What did you do at work last week? What materials and tools did you use?' These questions helped me a lot to put what was learnt at school into practice.*

(Luca, male, apprentice, industrial and mechanical trades)

##### **Extract 22**

*At school, I sometimes tell the teacher about some procedures that he didn't know yet. He appreciates this, confirming to me that he was happy to learn something new.*

(Alberto, male, apprentice, industrial and mechanical trades)

##### **Extract 23**

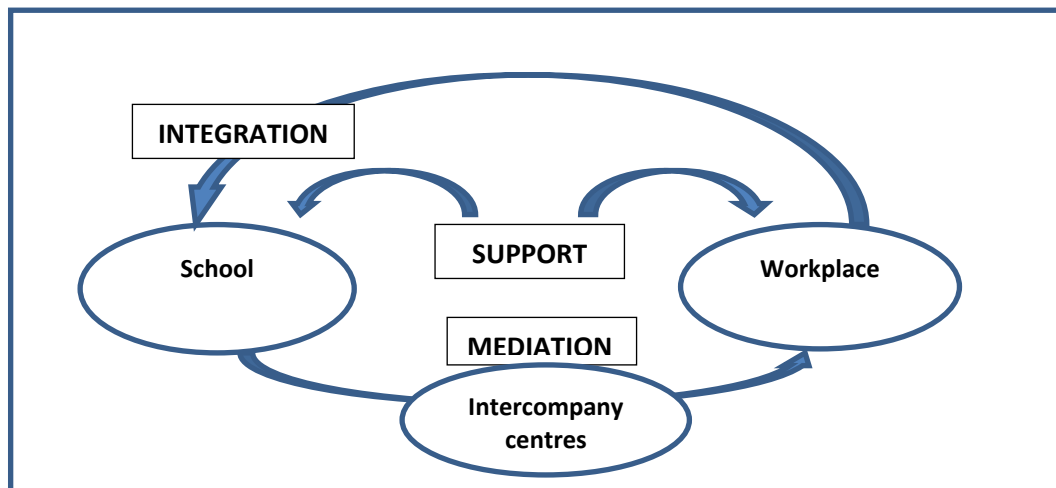
*In the first 10 to 15, sometimes even 30 minutes, I usually ask questions such as, 'So, what did you experience last week? Are there any questions or problems concerning this? What about theory; did you put something into practice?' Students usually like this, you know, kind of [imitating students raising up their hands]. . . 'Me, me, I am going to tell you' or 'No, please, teacher, look at this, look at this kind of question I asked.' Then, I let them talk, one after another, and then discussion pops up.*

(Carlo, male, vocational school teacher, industrial and mechanical trades)

Aims attributed to the workplace and to the intercompany centres are similar to those described in the third conception.

*Relative positions of different learning sites:* The main qualitative difference in this conception is the integrative role attributed to the school. The mediation function attributed to the intercompany centres in terms of helping apprentices transfer theoretical school learning into working practice is, in this conception, enriched by the schools' intent to integrate different situation-specific (school and workplace) forms of practice. In contrast to the second conception (see, for example, Extract 15), this conception is based on vocational teachers' availability to address discrepancies perceived by apprentices between what is learnt at school and what is experienced in the workplace. These discrepancies are seen not as problems but as opportunities for learning (see, for example, Extracts 22 and 23). We consider this process integration because of its circular and bidirectional nature.

Figure 4. Vocational learning and teaching across learning sites as integrated by the schools



*Overall view:* The main distinguishing characteristic of this conception is the integrative function attributed to the school, which enriches the mediating role attributed to the intercompany centres and offers the opportunity to revise what is learnt at school in light of work experiences for a bidirectional process of learning (Figure 4).

Six participants expressed this conception: three teachers, two apprentices and one company trainer. All came from the industrial field.

***Second research question: Inclusion of the socio-cultural key claims in the individual conceptions***

To address this study’s second research question, we applied a theory-driven content analysis to check whether and how the four conceptions included the key socio-cultural claims on which we built our conceptual framework.

Table 3. Individual conceptions of vocational learning and teaching across learning sites and their association with socio-cultural claims

Key conceptual claims	Individual conceptions			
	Separate learning experiences	Complementary learning experiences	Mediation by intercompany centres	School-centred integration
Nature of vocational learning and teaching	Dualistic view of theory and practice	Competence-oriented approach	Competence-oriented approach	Competence-oriented approach
View of the transfer process	No transfer	Transfer not problematised as a learning process	Transfer seen as a learning process	Transfer seen as a learning process of re-contextualisation
Nature and direction of the association between learning in each context	No association	Complementary unidirectional association	Mediating unidirectional association	Integrative bidirectional association

Qualitative differences among the conceptions were identified in relation to the three socio-cultural keys dimensions (see Table 3): (1) the nature of vocational learning and teaching, (2) the nature of the transfer process and (3) the nature and direction of the association between learning in each

learning site. On the basis of these differences, a continuum can be traced from a more detached and simplistic view of vocational learning and teaching across school and workplace to the more integrative and complex models.

In terms of the nature attributed to vocational learning and teaching, a shift from a dualistic and detached view (theory at school and practice in the workplace) to a competence-oriented approach was identifiable between the first conception and the subsequent ones. In particular, the first conception described theory and practice as detached objects of learning respectively collocated at school and in the workplace (Extracts 3, 4 and 5). School learning is basically subject-related, and learning at the workplace is limited to practical activities. Social and communicative skills were recognised but basically described as generic and further separated by the real-work experience. The detached view of school learning and learning in the workplace seemed to be ascribed to the very different nature of education and work. Experiences at school and in the workplace are both perceived as useful but in relation to very different purposes: to gain theoretical knowledge for further education studies, on one side, and to accumulate experience on the job to increase their opportunities to be integrated into the labour market, on the other side (Extract 6). Starting with the second conception, a more holistic and complete view of vocational learning appeared. In particular, the description of school learning and teaching was detailed in terms of knowledge, capacities and attitudes (Extract 8). Learning in the workplace became more 'situated' (Extracts 9 and 11), and the definition of practical learning was enlarged by including motivational attitudes, such as the sense of responsibility cited in Extract 9. These aspects suggested the assumption of a more competence-oriented view of vocational learning and teaching (Eraut 2004; Baartman and Bruijn 2011; Wesselink et al. 2010; Tynjälä 2008).

Substantial references to the transfer of skills and knowledge from school to the workplace seem to be absent in the first conception (Extract 4 and 6). In contrast, the second conception's complementary view of learning at school and in the workplace supports the idea that what is learnt at school is transferable to the work context (Extract 10). However, in the second conception, the transfer seems not to be perceived as a learning process. In this view, in fact, the content correspondence between school programmes and the needs of the world of work seems to be considered a sufficient precondition for transferring knowledge and skills from school to the workplace. Supporting this interpretation is the fact that discrepancies reported by students between school and workplace were not questioned by teachers. On the one hand, discrepancies were interpreted by teachers as a consequence of improper procedures applied in the workplace since they did not correspond to what was included in the formal training plan (Extract 15). On the other hand, when discrepancies were perceived as inevitable, it is up to the apprentices to be flexible (Extract 16). In contrast, the third conception recognises a mediated space of transfer, specifically collocated within the activities of the intercompany centres. From this view emerged the need of learners to be supported to 'transfer' school knowledge and skills to make them applicable to the different context-related situations (Griffiths and Guile 2004; Middleton and Baartman 2013). 'Putting theory into practice' was here described as a distinct—although integrated—process of learning and teaching (Extracts 17 and 18). A further widening of awareness of the context-embedded view of transfer is supported by the integrative role attributed to the school into the fourth conception. Specifically, the opportunity to discuss and reflect upon different ways of putting vocational knowledge and skills into practice (Extract 21), especially in relation to different contextual demands and constraints (at school and in the workplace as well as within different work

situations), constitutes what historical-cultural scholars would interpret as a ‘horizontal resituating process’ (Tuomi-Gröhn and Engeström 2003; Van Oers 1998). This refers to the process of the re-contextualisation, instead of de-contextualisation, of similar activities in different contexts. In this perspective, discrepancies between what is learnt at school and at work are ascribed to the situated nature of each activity, and they constitute an interesting opportunity to ‘support learners to develop the capability to mediate between different forms of expertise and the demands of different contexts’ (Griffiths and Guile 2004, p. 120).

Finally, the nature and direction of the association between learning in each context gives us the framework to interpret the last qualitative differences. The second conception introduces a complementary association between learning sites (Extract 13), while the third conception adds a mediation process (Extract 20). The fourth conception presents a shift from a unidirectional view of the transfer of school-based learning to the workplace to a circular and bidirectional learning process in which workplace experiences become an integral part of school learning (Extract 21). This view introduces an intent to integrate school and work experiences. The workplace is not perceived only as the context of competence transfer but rather as an integrative part of the competence learning process. This integrative view leads to what in a socio-cultural perspective is defined as a *boundary-crossing learning process*, which values productive interactions between different socio-cultural practices instead of attempting to make school and work experiences consistent (Akkerman and Bakker 2012; Middleton and Baartman 2013).

## **Conclusion**

This study explored how a group of Swiss teachers, trainers and apprentices conceptualise vocational learning and teaching across learning sites and the extent to which these conceptions include the selected key claims derived from a socio-cultural approach. Phenomenographic data analysis helped to identify four individual conceptions: (1) a set of separate learning experiences, (2) a set of complementary learning experiences, (3) mediation through intercompany centres and (4) integration that takes place in the schools. From a socio-cultural perspective, qualitative differences among these conceptions were interpreted as a progressive shift from a more dualistic and unconnected view of vocational learning across learning sites toward a more integrated and connective conception of that process.

We are aware of the limits of this study. Its explorative nature does not allow inferences or generalisations. The small size of the sample and the fact that all participants come from the Italian-speaking part of Switzerland further limit the possibility of generalising our findings. Moreover, the main objective of the study was to identify different ways of conceptualising vocational learning across learning sites, not the potential effects of those conceptions on learning and teaching.

In spite of this, some implications can be hypothesised, and those hypotheses can guide further study. Regarding teachers and trainers, it is plausible to hypothesise, supported by the phenomenographic literature, that a more integrated view of learning and teaching across learning sites could stimulate them to develop teaching strategies that integrate school and workplace learning. In particular, conceptualising knowledge and skills transfer from school to the workplace as a process could lay the foundation for greater awareness among teachers and trainers of students’

need to be supported in their boundary-crossing between school and the workplace (Tynjälä 2008; Guile and Griffiths 2001, Baartman and Bruijn 2011; Akkerman and Bakker 2011).

Nevertheless, recognising transfer as a learning process does not ensure that teachers and trainers will assume an active role in promoting the integration of apprentices' experiences. Teaching strategies aiming to help students integrate their learning and working experiences and to identify continuities as well as contradictions (Akkerman and Bakker 2011; Schaap et al. 2012) are more likely to be adopted by teachers and trainers who adopt an integrative view of vocational learning. Such a view could also help teachers and trainers to understand better the meaning and relevance of collaboration among learning contexts, thereby encouraging collaboration. Being aware of the need to collaborate could in fact be a precondition for developing the shared responsibility between teachers and trainers that various scholars emphasise as relevant for students' learning (Tynjälä 2008; Griffiths and Guile 2004; Wesselink et al. 2011).

Regarding apprentices, it is plausible to suppose that a more integrated view of vocational learning—and encouragement of the idea that connections between school and workplace learning are possible—could support their inclination to seek such connections. It could stimulate greater and more explicit demand that teachers and trainers discuss perceived differences and contradictions between what is learnt at school and in the workplace instead of legitimising a separation between school and work as inevitable and unquestionable.

Future phases of this study are expected to analyse differences among vocational fields. Some potential differences have already emerged. Participants from the field of business and administration tended to adopt a less integrated view of vocational learning and teaching across learning sites, while the majority of those from the mechanical-industrial field seemed to adopt a more integrated view. Even though the limitations of our study require us to be cautious about drawing definite inferences, this observation is in line with suggestions from other authors (see, for example, Tynjälä 2008) and certainly underlines the importance of considering vocational field specificities when studying vocational learning and teaching across learning sites. This study provided a basis for investigating whether and how individual ways of conceiving vocational learning and teaching across learning sites can foster or hinder the effective implementation of an integrated learning and teaching approach and, consequently, influence students' development of vocational competence. Future steps will include the development of a questionnaire to collect data on individual conceptions, teaching strategies and students' vocational competence. A wider and more representative sample of teachers, trainers and apprentices will be invited to participate.

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