Chapter 15
Professional Education Between School and Practice Settings: The German Dual System as an Example

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Abstract This chapter uses the case of the dual system in Germany to derive general and exemplary conclusions for co-operation between school and practice settings in professional education. It can be shown that co-operation between two learning settings as unequal as enterprises and schools does not come by default. It needs to be organized taking into account didactical, organisational and governance dimensions. The dual system is used to illustrate how these dimensions impact vertical and horizontal co-operation on four distinguishable action levels: macro-, exo-, meso- and micro-level. Characterising schools and enterprises as incommensurable living environments is then used to shape the requirements for didactical designs, which leverage the fact that learners in the dual system cross the borders between these settings regularly. Here it is pointed out that each setting is constituted by distinct rationalities and both have a theoretical and practical dimension. If co-operation is still to be fostered, school and enterprise actors need to find a 'higher standard', which can be used to design sequences of instructions in the alternating settings. Therefore the learners perspective is to be considered. Finally a ladder-model of co-operation in vocational education and training is employed to systematise best practices for co-operation between school and practice settings.

Keywords Co-operation • Didactics • Institutions • Dual system • Curriculum • Theory • Practice

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15.1 Introduction

Professional Education takes place at different settings. In this chapter vocational education and training (VET) in Germany is taken as an example to elaborate the potential and problems that occur when different settings are to be linked, because learners cross the boarders between these settings. These considerations are of particular relevance when learning at schools and enterprises is at stake.

15.1.1 Starting Points: Learning in Different Environments

With an open-minded view of the world, what would we see if we looked at different learning arrangements in schools and enterprises? Let us imagine that vocational education is fostered in schools and enterprises. Teachers would instruct students and trainers would work together with employees. There would be a typical class-room, on the one hand, and a working environment on the other. Maybe we would recognise differences in the ways students and teachers interact, compared with trainers and employees. And possibly we would have the impression that enterprises are real-life settings and schools are preparing students for this real life.

However, at the latest at this point we have to acknowledge the assumptions we have made: Depicting an enterprise as a real-life setting where learning goes on is such a theoretical assumption, as well as the idea that schools and enterprises do something called vocational education. And, of course, we can try out different lenses to point out specific characteristics, but also similarities, of these two learning environments.

In an initial step we can define four layers to describe these two learning environments:

1st We can look at the *micro-level* of schools and enterprises. This means that we can compare the teaching and learning arrangement (class-room-setting) of schools with the working arrangement (job-setting) of enterprises. This leads to questions according to the learning approaches and the instructional designs in these different environments. At this level we see vocational education as a *learning approach* and an *instructional design*.

2nd We can analyse the different organisational structures of schools and enterprises looking for regulations, incentive systems, objectives, and so on, which, to a certain extent, regulate the possibilities to learn. This is called the *meso-level*. This is the *organisational setting* of vocational education.

3rd Schools and enterprises are not situated in neutral zones. They are always part of social life and are embedded in a network of regulations. In the school sector these are school authorities, normally a national administration system. The regulations for enterprises differ between countries. We have market-driven systems where enterprises primarily have to cope with the market and can

decide freely what they want to do with regard to learning. They mostly follow a market rationale. But there are also countries such as Germany, Switzerland, Austria and the Scandinavian countries where there are certain regulations for teaching and learning in enterprises. Therefore, we have to separate an *exo-level* which frames the learning and teaching activities in schools and enterprises. Vocational education is seen as an *institutional system*.

4th Finally, we can state that the administration (macro-level) is the result of political decisions in each country. This *macro-level* refers to the governance approach and is the institutional background of education. Vocational education follows a *governance approach*.

The differentiation of vocational education into these four layers: micro-level, meso-level, exo-level, macro-level was introduced by Uri Bronfenbrenner (cf. 1979). It makes it possible to separate different acting levels and show the interdependencies between the levels. There is some kind of *vertical co-ordination* between the layers.

Nevertheless, we are looking at two different settings. On the one hand, there are schools with their school organisation, embedded in an institutional system based on national agreements about what has to be taught, and by whom in school. On the other hand, there are enterprises that also carry out vocational education, based on the already mentioned market rationale and with the aim of achieving economic advantages through this work. Furthermore, there are differences in the institutional background, the organisational settings and, finally, of course in the different instructional approaches. This would be an interesting task in itself. However, it becomes more sophisticated when we take another perspective and look at students and workers who move between schools and enterprises. In other words, we do not look at the structure of both school and enterprise and work out differences and similarities. Instead in this chapter, we look at individual careers and ask what kind of changes happen if someone learns in schools as well as in enterprises.

These changes between the two so-called *learning places* can happen in different ways:

- It can be a biographical experience: a student enters work after finishing schooling, and continues learning in the enterprise.
- It can be part of a programme in vocational education and training. Here, there are three possible approaches(cf. Greinert 2004, 20 ff.):
  - It is a school-driven programme with phases of practical experience. This would be typical for vocational colleges in, for example, France or Finland. In the following this is defined as the *school-based approach*.
  - It is an enterprise-driven programme with seminars and workshops organised for the trainees. This is typical for big enterprises. In the UK this kind of programme is run by Rolls Royce. It is called the *enterprise-based approach*.
  - It could be a co-operative programme from enterprises and schools. This is the German *dual approach*, called the dual system (cf. also Raggatt 1988 and Deissinger and Hellwig 2005, 312 f.).

Action Layer	Acting Context (Field)		Learning Places	
			School	Enterprise
Macro-Level	Policy	*Vertical Co-Operation*	Governance	
Exo-Level	Administration		National authorities	Market/Chamber[1]
Meso-Level	Organisation		School	Enterprise
Micro-Level	Working/Learning		Classroom	Working place
			Horizontal Co-Operation	

Fig. 15.1 Vocational Education (VET) as an ecological system

If we look at the object 'vocational education and training' from the perspective of the learner who moves through different learning arrangements than we can ask the following questions on professional education:[1]

1st Can school-based and work-based learning be linked together? This is a matter of co-operation between teachers at schools and trainers at enterprises. The concrete co-operation depends on the specific circumstances of each learning place and the co-operation needs. These depend on the sort of programme. There are different needs according to whether it is school- based, enterprise-based or has a dual approach.

2nd As the learning is embedded in different learning places can there be pathways between these different places? Can these pathways be built up? In other words: How is the co-operation between school and enterprise as specific social organisations organised?

3rd As schools and enterprises follow different regulations (institutions) it is necessary to compare the institutional background of the learning places and look for connections between these requirements. If the movement between school and enterprise is institutionalised in a dual programme it is mandatory to develop new regulations. In social systems where dual approaches are already established these regulations already exist.

Considering this necessary horizontal co-operation the BRONFENBRENNER model has to be further developed to become a bilateral co-operation approach. Therefore the four different layers – micro-, meso-, exo- and macro-level – are not only linked to a corresponding field of action – such as working/learning, organisation, administration and policy – but are also distinguished for both learning places. Here the learning places 'school' and 'enterprise' are further explored, by specifying each layer separately. In addition to that vertical and horizontal dimensions of co-operation need to be considered (see Fig. 15.1). How this complex framework will be developed throughout this chapter is described in the following Section.

[1] As is shown later on, VET in enterprises can also have a specific administration. It is, for example, part of the German governance approach to regulate VET in enterprises. The chambers have the function of public authorities in regulating the education work going on in enterprises.

15.1.2 Vertical and Horizontal Co-operation in Vocational Education and Training

To develop a framework for co-operation on different levels, I will discuss the vertical and horizontal co-operation, which occurs when a systematic connection between schools and enterprises is established. This will be discussed on the basis of the German dual system, which is taken as a case study to illustrate the complex nexus of highly specific individual aspects. Such single objects are: the instructional approach in enterprises, the syllabus types in the school and in the enterprise sector, the incentives in school and in enterprises, the organisation of work in enterprises, the school organisation, the profession of teachers and trainers and so on. Research has been undertaken in each of these aspects and of course into many objects not mentioned here. The point of view in this paper is the question of how these single aspects work together in the complex world of vocational education.

The German dual system is the broadest approach. It covers the school approach and the enterprise approach to a certain extent. Thus, these sub-approaches can be illustrated in the case of the dual system as special applications.

In this contribution, the German dual system will be examined as a case for a co-operative training programme where schools and enterprises work together in joint programmes on vocational education and training. Therefore, the background of the so-called dual system will be summarised and the kind of co-operation established in this system will be detailed (Sect. 15.2). After that the theoretical approaches towards co-operation will be discussed (Sect. 15.3).

15.2 The Case: The German Dual System

In Germany, initial vocational training is organised into three different pillars: (1) the so-called dual system, in which enterprises and schools run a co-operative programme, (2) school-based VET, which is of relevance to the health sector, music and education and (3) the so-called transition system, which consists of various disjointed educational provisions aimed at providing pathways into one of the first two pillars of VET or into the labour market. Despite its shrinking quantitative scope, the dual system still receives the most attention and can be seen as the centrepiece of VET in Germany. Even though it is not the exclusive vocational track, it represents what makes VET in Germany special. One of the particular features is the corporative structure, on which the dual system is based. The basic concepts of this structure are the focus of the following Sect. (15.2.1). In addition to that complementary dimensions of co-operation within this structure are discussed later on (Sect. 15.2.2).

15.2.1 The Basic Structure of the Dual System

At first sight, (see Sect. 15.1) the two learning places of school and enterprise are working together, educating young people. This necessarily establishes co-operation, but only in an organisational meaning of building an agenda for the learners to inform them when they are at school and when they are at work. Behind this agenda lies an institutional framework. Schools have to implement a syllabus which, in Germany, is formally established by a Regulation of the Government of a Federal State, for example, Lower Saxony. This is based on the cultural autonomy of the German *Länder* (the federal states) which is based on German Constitutional Law. The result could be 16 different syllabi. The comparability of these state regulations is therefore organised by a supra-regional organisation: the so-called standing conference of the *Ministries for Culture*. There are also regulations regarding the part of the programme which is run by an enterprise. These *training regulations* (*Ausbildungsordnung*) are a centralised Regulation of the federal Government and not of a regional government of one of the *Länder*. Trade unions and employers' organisations together work out the aims, content and organisational framework of the enterprise part of the training programme and develop training *regulations*. This is then legalised by decree of the Federal Government. In summary it can be noted that behind the joint VET-programme of enterprises and schools lies a sophisticated regulation system which, in Germany, depends on regional syllabi for schools and a federal syllabus for enterprises. The programme is a hybrid of compulsory education (the school part) and a private contract (the enterprise part).

As a consequence of this, different stakeholders influence the organisational and curricular framework of the programmes. They are located in an area of tension characterised by educational and economic aims. Thus vocational education claims to foster a twofold development of skills and personality.

Generally speaking, three underlying, independent concepts constitute the field (cf. Kutscha 2000, 5 ff.): (1) the concept of duality, (2) the concept of corporatism and (3) the concept of vocational education (*Beruf*).

These concepts are now discussed in more detail in the following Subsections.

15.2.1.1 The Concept of Duality

An apprenticeship in Germany runs on average for between 3 and 3½ years. It consists of two basic parts: (1) Training on-the-job in enterprises and (2) school-based learning in vocational colleges. Trainees spend about 3 or 4 days a week on in-company training and up to 2 days a week at vocational colleges.

Learning processes in training companies focus on learning at the workplace or instruction in company training departments with an emphasis on the practical elements of the training occupation. The vocational college provides general and vocational education for students in one specific vocational field. These students usually have their on-the-job training in different companies within the commuter belt of the school.

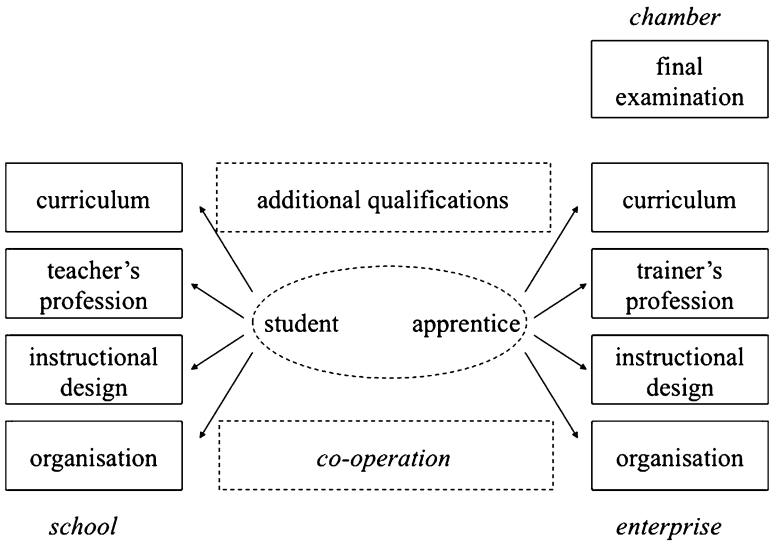

Fig. 15.2 The structure of the dual system

Whereas federal law regulates the former, the latter falls, as already mentioned, under the legislation of the regional Government. Harmonisation processes are in place to integrate both parts of the training and to ensure the comparability of the provision in the 16 *Länder*. The term 'dual' refers primarily to the division of training into two separate learning places, each regulated by its own distinct legislators.

However, the principle of duality goes beyond the division of training into two training venues. The duality of the structure is also reflected in systematic features such as the role and status of training personnel, the funding regime and the supervision of training processes (cf. Ertl 2002; Sloane et al. 2004). That means the attribute of duality goes beyond merely the location of learning. Even teaching and learning processes are shaped by duality, what will be discussed in more detail later (see Sect. 15.2.1.4 and Fig. 15.2).

15.2.1.2 The Concept of Corporatism

The term corporatism describes an institutionalised form of collaboration between governmental bodies, employers' associations, trade unions and other collective actors. This form of policy making is of particular importance to labour-related decisions including collective bargaining and vocational training in Germany (cf. Voelzkow 2009, 461). The negative connotation of this is legalised lobbyism. The reverse interpretation is corporatism as a form of participation leading to broad consensus among social groups and greater social stability (cf. Sloane et al. 2004, 218). The dual system is a typical example of this type of governance and therefore, in terms of its regulative structure, may be best described as a state-controlled

market model or Rhineland capitalism (cf. Greinert 2004, Sect. 15.2). Characteristic of this form of capitalism is a state that sets the guidelines for the co-operation of employers and trade unions. Within these guidelines social actors make their own choices. This model is regarded as an efficient way of limiting the risks of 'market failure', on the one hand, and 'state failure', on the other (cf. Kutscha 1995, 10).

Another important feature in this model is the delegation of regulatory competence for the training system from the government to corporatist bodies. The most important of these bodies are the local, self-governing Chambers of Industry and Commerce, the Crafts Chambers, the Chambers of Agriculture and the Associations of Professions. They have the status of 'competent bodies' (*Zuständige Stellen*) and play a crucial role in the organisation, administration and examination of vocational training. More precisely, these bodies act as intermediate organisations between the state and companies and put training laws and regulations into practice. The Chambers have the status of public autonomous agencies that oversee the legal and regulatory norms of vocational education and training within their sphere of responsibility according to the legal guidelines set by the state.

Following the 'principle of voluntariness', no employer is obliged to take on trainees. Legally the trainee contract affiliates to private law. However, all firms have to register with a Chamber and those wishing to provide training must be approved by the Chamber as a training company. The approval depends on the equipment and resources of the company, and the qualifications and experience of the trainers working for the company. Furthermore, the local Chamber supervises the organisation and assessment of intermediate and final examinations and acts as an awarding body for vocational qualifications.

Trainees in Germany have a training contract with an enterprise and they have to attend the vocational school, unless they are older than 18 when signing the training contract. In that case they are allowed not to attend school. However, this hardly ever happens, because the shared responsibility of schools and enterprises for vocational education in the dual system is a deeply institutionalised pattern of thought and action that does not require tighter legislation. Having a contract does not mean that the two partners, i.e. the trainee and the enterprise, are allowed to develop their own training programmes. The structure of the training programme is regulated by regional (*Länder*) and federal (*Bund*) laws.

A further example reflecting the principle of corporatism in the training sector is the composition of regulating and executive bodies of the dual system. For instance, supervising and examining bodies are set up by the Chambers and consist of equal numbers of employers' representatives, employees' representatives and vocational college teachers. The most important of these bodies at the executive level of the training system are the vocational training committee and the board of examiners.

15.2.1.3 The Concept of Vocational Education (*Berufskonzept*)

The German term *Beruf* can be regarded as broadly untranslatable. Given its original formative context, '*Beruf*' carries the meaning of 'calling'. After its application

to the world of work in the age of industrialisation, a change of meaning took place. Nowadays neither 'vocation', nor 'profession' is congruent with the German term, but the former is used here because the latter is too closely bound to academic occupations. The idea of vocational education is the already mentioned twofold idea of developing skills and being educated. From this point of view, vocational education and training aims to develop competences and competencies.

Competency refers here to specific capabilities (skills, attitudes) which are useful for the challenges of the workplace. Competence has a generic and holistic meaning referring to a person's capacity, and has a more educational perspective (cf. Eraut 1994, 179). Therefore, vocational education and training in the German tradition is a concept of 'education in and through work'. The individual personality is indeed influenced by working. The concept of vocational education identifies the individual's capability to work and act competently in a vocational environment as the overarching aim of vocational education and training.

Education as part of the learner's personal development has been a constant feature of vocational education in Germany. Further, this concept reflects the need to prepare young people not only for a small number of specific tasks at one company, but to provide a qualification applicable to many employment contexts and responsive to the changing economic and social environments of a whole occupational field. Facilitating a student's personal development is, in most countries, a function of the higher education system. In Germany, this kind of development is also seen as an integral part of vocational education.

15.2.1.4 Didactic View on the Dual Training Approach

The dual system is not only seen as an economic vehicle providing a pathway from school into qualified employment, but also as a didactic approach carried by several social actors. Therefore it is quite useful to describe vocational education and training from a didactic point of view.

In the case of vocational education and training, the German concept of didactics integrates different aspects into one holistic approach[2]: (1) the organisation (regime) of education, (2) the instructional design, (3) the intentions and the curriculum (syllabus, basic assumptions, main tasks and so on.) of teaching and learning, (4) teachers resp. trainers and (5) learners as subjects of the learning process. Learners in the dual system hold multiple roles: students at a vocational school and apprentice at an enterprise. It is important to note that these aspects are interdependent elements. By further conceptualising them, innovation processes within the dual system can be explained. Furthermore the duality mode of the system becomes visible again. Each of the didactical aspects can be worked out school-based and enterprise-based. In addition to these basic elements also (6) additional qualifications and

[2] *Didactic* is not an approach just referring to vocational education and training. It is a general mindset for learning and teaching perspectives in various socio-economic living environments as well as the aims of these processes and mechanisms to regulate instructions.

(7) final examinations are discussed in more detail. All of these didactical aspects respective institutional elements also reflect the core topic of this chapter: the need for vertical and horizontal co-operation on different levels. Figure 15.2 offers an illustration of all these elements.

In the following all these illustrated elements are specified:

(1) *Organisation*

Vocational colleges and enterprises are educational *organisations* within an institutionalised field. In economic theory, *institutions* were defined as humanly devised formal and informal rules that shape human interaction (cf. e.g. North 1990, 3–5). The terms 'institutions' and 'organisations' can therefore not be equalised. Organisations are social entities that establish boundaries to determine members and non-members, whereas institutions may be the cause of an organisation, define the relationships of the organisation with other social actors and establish a basic set of rules for the interaction within the organisation that is shaped by the organisational/corporate culture. Thereby institutions determine the way in which work challenges enter teaching and training contexts. As we have seen, the principle of corporatism is at the heart of the institutional framework of the German training system and provides the social partners with a high degree of influence. Schools and training institutions interpret the guidelines set out by the authorities and social partners and decide on the ways in which they react to the changing challenges from the world of work. As will be shown below, educational organisations can be part of variable living environments, which are, among other things, established by distinct causes. Schools are established for educational purposes and enterprises for maximising profit. However, within the German VET system, beyond maximising profit, enterprises also fulfill an educational purpose.

(2) *Instructional designs*

Instructions are not only techniques and methods teachers and trainers use to enhance the trainees' learning processes. Instead, the *instructional design* is a complete learning and teaching approach referring to learning theories and cognitive strategies of learners, on one hand, and the intervention strategies of teachers and trainers on the other. These approaches are worked out in rather sophisticated programmes such as case studies, projects, research-based learning and problem-based learning.

Education of those, who do this work and research on this type of VET is performed by university units for Business Education. Further research is done by public and private funded research institutes. Whereby two different styles of research can be distinguished: a psychology-based empirical program, which focus on testing instructions in a stable context and on verifying competence levels (cf. e.g. Achtenhagen and John 1992) on the one hand and a design-based research program, which focus on the development of prototypes for specific contexts together with field actors on the other hand (Euler and Sloane 1998). Considering the context of applying didactical theory is of importance also, because quantitative empirical test designs show that the variance of instructions in different settings, which were all

designed based on a generic didactical concept may be larger, than the mean variance of instructions in a number of test settings based on alternative didactical concepts (cf. Euler 2011, 529). This can be explained by the "quality" with which didactical instructions are developed and used (cf. Nickolaus 2010, 57). Based on that, Achtenhagen and John (1992) argue that there is consensus among experts that complex learning-teaching-arrangements are a concept that attempts to respond to wider social and economic megatrends within the field of vocational education and training.

(3) *Curricula*

Curricula set the standard for the knowledge and skills regarded as relevant by the institutional actors and enterprises and schools have their own forms of them. Curricula include documents such as training plans and lesson plans. There are different ways to formulate the challenges of the world of work in curricula: they might be outcome-oriented (describing the tasks trainees should be able to perform) or input-oriented (describing the way in which the training processes should be conducted). In Germany, curricula were traditionally expressed in terms of inputs such as teachers' and trainers' qualifications, class contact hours and training contents (Koch and Reuling 1998). However, the last one and a half decades have seen a sweeping shift towards outcome-oriented curricula. In this shift 'learning areas'[3] for the schooling part were introduced and a large number of enterprise-related curricula were rewritten. For the years 1996–2012 that applies to more than 300 curricula for enterprise-based VET (*training regulations*) and more than 250 curricula for school-based VET (cf. KMK 2013). Usually the processes for the development of enterprise- and school-based curricula referring to the same qualification are synchronized. Nevertheless, the curricula of schools and enterprises remain in distinct legislative regimes, which influences the transfer processes between the world of work and the school-based training contexts. Furthermore during the shift to learning outcome also new curricular formats were introduced such as educational standards (cf. Ertl 2006) and qualifications frameworks (cf. Sloane 2008).

Returning to the case of the dual system, a situation with only loosely-coupled curricula, it can be argued from a more theoretical perspective, that increased opportunities for learners to integrate their developing academic and work knowledge have to be provided, as they develop their learning/work identities through repeated episodes of 'boundary crossing' between school and work (Griffiths and Guile 2001). The type of curricular options available to link these worlds will be discussed later on in this paper (Sects. 15.3.3, 15.3.4, and 15.3.5).

(4) *The teachers' and trainers' profession*

Pedagogic staff in schools and enterprises are characterised by distinct recruiting and education processes. While teachers receive their education at universities and develop a pedagogical self-image, trainers are promoted within the company after

[3] For more on curricula based on *learning areas*, see Sect. 15.3.4.

professional experience. Their pedagogical qualifications are often quite limited, even though a relatively weak legal minimum standard is in place (*German Trainer Qualifications Act*, AEVO). To this end, teachers and trainers translate the contents and aims set out in their respective curricula into teaching and learning situations on a day-to-day basis. In addition, they are sometimes part of the institutional framework, since they assume roles in school administration and curricula commissions. The way in which they fulfil these functions depends on their qualifications and their interpretations of their professional role. The degree to which teachers have contact with the world of work varies; some of them might consider this contact as less important than pedagogical skills and knowledge.

(5) *The Learners: students and apprentices*

Learners in the dual system are integrated into two different learning places. As has been said before they are working up to 4 days a week at their respective enterprise and up to 2 days a week they go to school. The roles and expectations in these two roles differ a lot. At their enterprises the learners are also expected to contribute to the value adding process. Especially small handicraft enterprises depend on the work of apprentices, who receive compensation in form of collectively negotiated wages below the level of skilled workers or employees. When theories, values or practices taught at school and enterprises are not consistent with one another, learners have to decide to which concepts they align their actions. More often than not the enterprise side proves to have the greater power of persuasion. However the theoretical knowledge that is offered at school is usual considered crucial to pass the exam for the enterprise-part of the qualification. This exam is owned by enterprise representatives, but includes so called practical and theoretical parts (for more on theory and practice see Sect. 15.3.1).

(6) *Additional Qualifications*

Additional Qualifications are supplementary programmes to the institutionalized and closed vocational profiles, for example courses in entrepreneurship, intercultural communication, foreign languages and so on. These are offered by schools and enterprise organisations (cf. Braukmann and Sloane 1997). They are outside the formal regulations and are seen as a possibility to individualise the apprenticeship programme and offer further flexibility. They are often established on the basis of Chamber provision. In a study of about 6,000 apprentices 65 % say it is important or very important for them to gain additional qualifications (Gei and Stertz 2010, 3). This reflects the need for individualizing the standardised profiles of the dual system.

(7) *Final examinations*

The regulation of the *final examinations* for the dual system is completely controlled by the enterprises. *De jure* the schools have their own examinations, which are *de facto* of minor relevance. The most significant final examination should reflect the instructional design, on the one hand, and the curriculum on the other. In this case it would be possible to evaluate how well the training programmes

work. However, in fact there is a huge distinction between the work in the enterprises and vocational colleges and the examination bodies (chambers, collectively representing enterprises). This predetermines the pedagogical work in the training programmes. The final examination has the quality of a *'hidden curriculum'* because the teachers often have to organise their work referring to the examination structure of the enterprises in the dual system and not referring to the basic syllabus of the schools. Ongoing research on this type of examinations shows that the intended competence profiles may not be validated by the exercises currently used. For example it can be shown that domain-specific and cross-domain knowledge is not tested separately, thereby allowing apprentices with prior experience advantages in the test design that go beyond their actual (latent) knowledge (cf. Winther 2011). Regardless of these challenges, the final examinations for a vocational profile within the dual system proves to be of great quantitative importance. About 750,000 apprentices pass their vocational exams each year compared to just about 360,000 graduates of higher education institutions (cf. Destatis 2012, 82).

Having considered these seven elements of the dual system, which also specify fundamental differences between the learning settings, it is now necessary to consider in the next section how co-operation between enterprises and schools may still get in place.

15.2.2 The Co-operation Between Enterprises and Schools

The co-operation between the distinct learning places 'enterprise' and 'school' might be considered to be the centerpiece of the dual system. However, as shown earlier, separate forms of legislation, curricula for job-based-learning and colleges as well as a disparate institutional logic emphasise the separation of both settings, rather than the dual sides of a shared learning process or objective. To show how the co-operation between both learning places can be organised, the current state shall be discussed.

Co-operation between enterprises and schools within the dual system addresses, on the one hand, the didactical quality of learning and teaching and, on the other hand, institutional questions. Institutional questions are relevant when it comes to the organisational infrastructure and co-determination in political decision-making.

Institutional order and didactical-organisational implementation are two sides of the same coin that represents co-operation:

- the didactical dimension of the dual system: the combination of generalised (systematic) learning arrangements in schools and case-based learning in enterprises. The didactical perspective considers the matching of both forms of learning and/or teaching;
- the institutional dimension of the dual system: this includes the political organisation of the participation network of governmental bodies, trade unions and employers' representatives regulating the dual system. This neo-corporatistic

governance system applies explicitly to the enterprises, but *de facto* also impacts on the schools. This institutional order leads to a further distinct German feature: the funding of apprenticeships predominantly by enterprises (totalling about 25 billion € per year, BIBB 2009, 229). However a further study reveals that average training costs per apprentice per year of 15,288.00 € are reduced by an average income per apprentice of 11,692.00 € to net costs of only 3,596.00 € (cf. BIBB 2009, 233). However the high stake of enterprises in the funding of the whole system is unchallenged.

When the importance of VET in Germany for the integration of a large share of a cohort into the labour market and for the economy is in question, both sides of the coin have to be considered. Even though the didactic dimension serves as the focal point of the discussion in this chapter, the institutional side remains complementary. This bilateral composition is already visible in the contractual form. Trainees are, through their trainee contract, which is a type of employment contract, part of the enterprise and thereby part of the economic system. Then again this economic system constitutes a complex learning environment for them, which the trainees unlock through an individual learning process. Furthermore, trainees have a second role as students in a vocational school, which is a part of the schooling or educational system.

Alternating roles, learning places and institutionalised systems raise the issue of relating educational and economic systems. School and enterprises are seen as subsystems of these parent systems with distinct rationalities (cf. Stratenwerth 1959, 812; Pätzold 1997, 126 f.). In order to harmonise school-based and enterprise-based learning, a reference to a "higher standard" (cf. Euler 1999a, 6, translation by the current author; Euler 1999b, 249) must be established. A point of reference for such a higher standard can be the didactical design of transfer options, which are characteristic of a system in which two learning places are involved.

With regard to co-operation two different forms of alignment between schools and enterprises are possible:

1st The School precedes Enterprise
2nd The School follows the Enterprise

(1) School precedes Enterprise

This is, for the most part, the standard case in the dual system. In recent decades schools have had some kind of hidden leadership in organising the instructional design of the dual programmes. This becomes clearer when the training contracts are taken into consideration. In 2009 approximately 560,000 contracts for a training programme were concluded by 493,000 enterprises.[4] These simple figures already show that enterprises participating in the programme have, on average, only one apprenticeship per year. The school part of these apprenticeships is organised by 8,800 schools.[5] In the standard case in a school class for, for example, industrial

[4] Figures from: BIBB 2009, 111, 172.

[5] Figures from: DESTATIS 2012, 86.

clerks, 30 students study in one class and work in between 25 and 30 different enterprises.

This makes the schools and the teachers the hidden organisers of the programme. On a day-to-day basis teachers have to organise the co-operation with the enterprises.

This is often managed at an instructional level. Approaches are:

- Teachers present theories and concepts and give the students advice regarding how to experience them in the enterprise. This can, in some cases, cause problems if the enterprises perceive this as interference in their work. This is the process from knowing to doing.
- Teachers ask students, for example, to summarise this and develop some of the theoretical backgrounds of these examples. This approach, from doing to knowing, can also have certain difficulties as it is necessary that the students access practical experience in their enterprise work (for illustrations see Sect. 15.3.3 ff.).

These two examples already show that the co-operation can be regulated by two instruments: it can be established in the curricula of enterprises and schools to organise a convergence of practical experience and school-based learning. It can also be managed by some kind of collusion between trainers and teachers. In both cases we have to keep the figures in mind: 560,000 contracts: 30 students, 30 enterprises and one class with one or two teachers respectively. The discussion of this aspect of co-operation will be continued later (see Sect. 15.3.4).

2. School follows enterprise

This approach is typical of some in-house classes in large enterprises. In Germany firms such as Siemens have the possibility to make arrangements with single vocational schools. In these – in this case so-called – Siemens classes they can then have, of course, special arrangements with the school. This makes it possible to have problems and cases in the enterprise as a starting point for instructional arrangements. The learning starts in the enterprise and students are sent by their trainers in the enterprise to the school with the task to find relevant knowledge to solve the problem. Teachers at school are then in a position to offer theories and concepts for real-life problems. This is an ideal approach to de-contextualising practical problems, providing theoretical background and forcing students to contextualise this knowledge in the enterprise surrounding. In Sect. 15.3.3 this will be analysed more deeply.

This approach needs far more than reconciliation at the level of the curriculum or some kind of exchange of information between teachers and trainers. In this particular case trainers and teachers have to develop a joint approach. This is of course a far deeper co-operation (see Sect. 15.3.2 for various levels of co-operation).

In the light of the above assessment the following preliminary conclusion can be drawn: From a naïve perspective on vocational education the daily work on training and teaching in schools and enterprises can be seen as two different learning surroundings. The interesting question then is whether there are any systematic pathways between these learning places which the students or the apprentices, respectively, can take in order to develop useful competences.

This discussion leads to institutional, organisational and curricular backgrounds of vocational education. The above discussion shows these backgrounds for the German case. A rather complex system of rules and levels of co-operation has been illustrated. At the end, two rather naïve approaches, and deliberately so, have been stated: A pathway from school to enterprise and one from enterprise to school. In summary the normal case according to the real conditions of the majority of apprenticeships is an organisation of the co-operation between school and enterprises by the schools.

In the following section this naïve position will be theorised again through applying some exemplary research results to different aspects of this co-operation between schools and enterprises.

15.3 Theoretical Approaches Towards Co-operation in Vocational Education and Training (VET)

In this section the following theoretical issues associated with understanding and evaluating co-operation will be discussed:

1st Co-operation versus incommensurability of learning places
2nd The Ladder-Model of co-operation in VET
3rd 'Running into practice' – sophisticated approaches towards co-operation in VET
4th The '*Lernfeldkonzept*' – realistic approaches towards co-operation in VET
5th Integrated apprenticeship – a visionary approach towards VET

Regarding the purpose of this chapter it is useful to note, that these conclusions from practices within the dual system in Germany, provide vantage points and pathways for the development of professional education.

15.3.1 Co-operation Versus Incommensurability[6]

Despite the vast potential for such distinctive didactical considerations, the logic of co-operation in the dual system is determined by the institutional order. This leads to routinised practices at the political and administrative level, where curricula are developed, whereas at the didactical level (i.e. learning places at schools and enterprises), co-operation remains random and casual. Therefore it falls to the trainees to connect the dots of fragmentary, inconsistent and unrelated experiences in enterprises and schools (cf. Euler 1999a, 13). Consequently, the didactical model of the dual system has to be challenged. The idea of a joint curriculum (*Gleichlauf-Curriculum*, cf.

[6]This subsection is based on the experiences in the research-programme WisLok which was founded by the Federal Minister for Research and Science (cf. HELP 2001; Dilger et al. 2001).

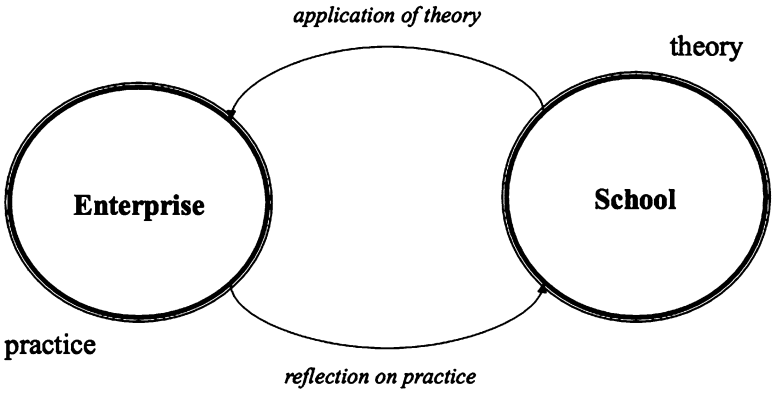

Fig. 15.3 Synchronization of theory and practice within the dual system – the traditional idea of joint curricula

Lipsmeier 1987, 57), which parallelises theory, provided by the school, and practice, provided by the enterprise, is considered obsolete (cf. Euler 1999a, 7; Kremer and Sloane 2001, 11 ff.; see Fig. 15.3).

Rather, theory and practice cannot be allocated to just one learning place, but must likewise be integrated in learning settings at both the enterprise and the school (cf. Kaiser 1994). This premise leads to schools creating space for practical experience (simulations, tutorials, junior firms, cases) and to enterprises providing theory (classrooms, e-learning tools). In fact, this not only happens at a conceptual level, but is also cognitive and tangible. Hence, the inherited theory-practice-model of the dual system is not viable any longer (cf. Kremer and Sloane 2001, 12; Tuomi-Gröhn and Engeström 2003).

Following this argumentation, designing transfer processes is not about allocating theory to schools and practice to enterprises and drawing on this 'good' matching of theory and practice. Instead the suggestion is made to see schools and enterprises as two incommensurable living environments, of which the matching has to be organised. Even though both living environments are constituted by distinct rationalities and institutional backgrounds, they each share a theory and a practice dimension (see Fig. 15.4). Linking theoretical knowledge and everyday experiences (cf. Pätzold 1997, 128) becomes a challenge within schools as well as within enterprises. In both living environments, the learners are confronted with distinct instructions, which demand actions consisting of both a theoretical and a practical perspective (cf. the findings at the symposium on 'dual system caught between tradition and innovation' in Twardy 1991). Thus, co-operation in professional education is not the matching of enterprise as the practical learning place and school as the theoretical learning place, but the matching of two distinct living environments, each deploying a practical and theoretical dimension. Both living environments provide distinct learning options. Therefore the suggestion is made to see co-operation as a combination of instructions in dual living environments which have to be organised taking into account the didactic and institutional dimensions.

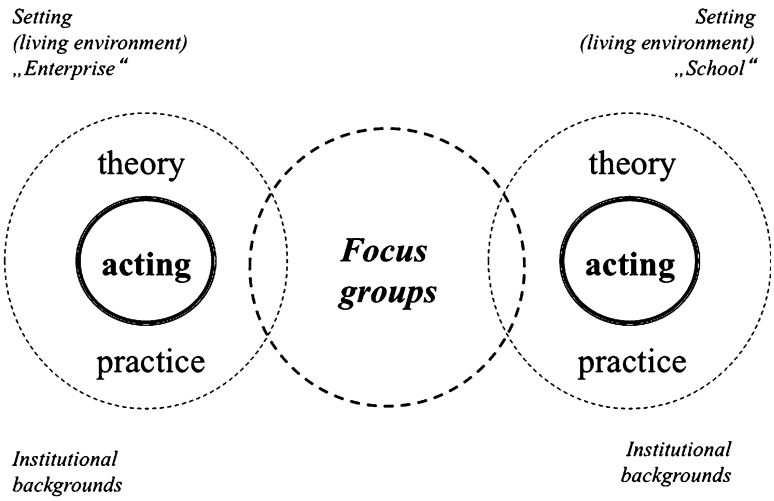

Fig. 15.4 The dual system as a matching process of distinct living environments

Furthermore, it is worth noting that the school carries out the lion's share of the organisational tasks within this co-operation. This specific form of task assignment is not formally codified anywhere and is in conflict with the formal statement of emancipated learning places. However, allocating the burden of managing two incommensurable living environments to the school is the result of routinised practices that have been going on for decades.

Even in a context where co-operation is needed, enterprises and schools sustain their own logic and institutionalised identities. Given this type of situation it is best to speak of co-operation in the dual system as loosely-coupled (cf. Weick 1976) entities.

15.3.2 The Ladder-Model of Co-operation in VET

In the discussion on co-operation the intensity of collaboration has been differentiated. Euler (1999a, 7) and Buschfeld and Euler (1993, 26ff) differentiate the intensity of co-operation according to mutual information, mutual matching and collaboration. Given that there is a basic demand for mutual information processes between the school and the enterprise, and given that co-operation is analysed in the context of the concept of learning areas (see Sect. 15.3.4), five levels can be distinguished: beyond merely informing one another, co-ordination, temporary co-operation, long-term co-operation and team-based partnership can be discerned (see Fig. 15.5). The continuum ranges from a relatively loose and unconnected co-existence to a didactic-based rehearsed collaboration. Scaling these different levels tends to be very difficult for the actors involved. Design-based research projects

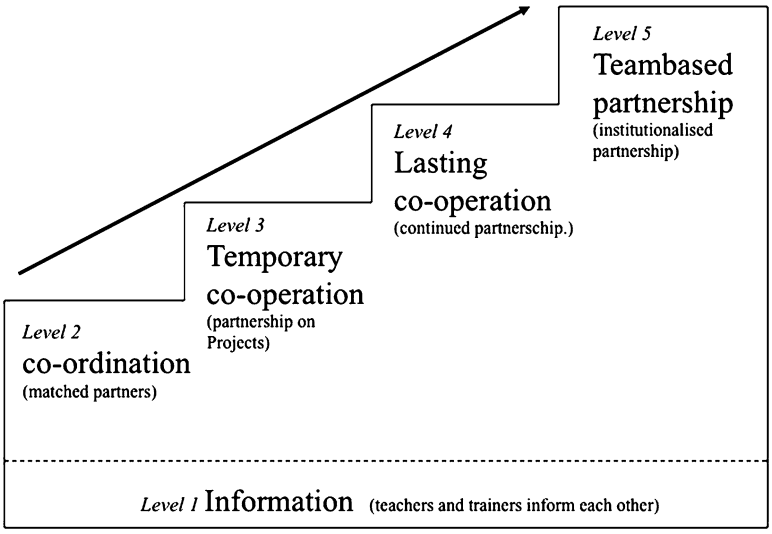

Fig. 15.5 Intensity of co-operation

show that a moderating voice is needed at least to introduce these processes and to have ownership of some procedures (cf. Diesner et al. 2004).

The examples in Sect. 15.2 on the two sequences (1) from school to enterprise and (2) from enterprise to school can be put into these classifications. The 'normal' school-to-enterprise co-operation is one on level 2. Based on level 1 (information) co-ordination between schools and enterprises is necessary. The enterprise-driven approach is at least at level 3. It is a partnership project.

15.3.3 'Running into Practice' – Sophisticated Approaches Towards Co-operation in VET[7]

As mentioned in Sect. 15.2, learning between the two learning places is often organised as a 'shift' from the school to the enterprise: At school, the subject knowledge and heuristic strategies are developed. It is then up to the students to apply this knowledge to practical problems. As there is no real matching between enterprise work and school learning (see Sect. 15.3.1), this often leads to declarative knowledge and non-contextualised knowledge.

Thus, it is to some extent a deductive approach with the following problems:

1st The students already have to have some kind of sensitivity towards practical problems. If they do not have this ability they simply do not know why they are

[7]This chapter is based on results from the project, FäLou' which was funded by the German Research foundation (cf. Sloane 2004).

learning specific subjects in school. Teachers often do not achieve this properly and may believe that theories are self-explanatory. Teachers have to understand that this knowledge has to be situated in a working context.

2nd The knowledge students gain at school cannot automatically be used by the students in their working context to understand the working context. In contrast, in the enterprise a 'working language' is often used which differs with regard to concepts and rules to the theoretical knowledge offered at school. This is not only a matter of vocabulary. There is quite a difference between practical (vocational) knowledge and theoretical knowledge.[8]

3rd Nevertheless, there is a gap between the tacit knowledge of the students and the knowledge students gain at school. In daily life they decide on the basis of tacit knowledge.

In the research and development-project 'FäLou' a 'context change' was organised. This change refers to a student's movement between the school and the enterprise. The central idea is that the contexts in enterprise and school fit together, and thus the students have to solve tasks in both learning places which match each other. The 'scenery change' is a joint learning arrangement of participating enterprises and a school. A focus group established by trainers of participating enterprises, teachers of the school and a research group developed this arrangement. This group-based work is an example of a co-operation at level 3 or 4 according to Fig. 15.5. It took nearly 2 years for the group to find a common basis for their work. During this time it was necessary to establish joint ideas on education, learning and so on.

After this establishing phase the focus group developed an arrangement for *cost structure analyses*. This concept is used to find out if the increasing prices of suppliers are justified. Normally, this analysis can be proved with a benchmark of prices of different suppliers simply by comparing competing offers. Now, the cost structure analysis is used for the case where there are no other comparable suppliers on the market. Then statistical approaches have to be applied to analyse the general development of costs in particular market segments. This is a practical task where theoretical knowledge can be applied.

In this arrangement the students have to manage three tasks. First, they have to assess a particular offer made to the enterprise. To do this they have to learn different statistical approaches and then apply these techniques to a report on cost development. This was done in school. Secondly, they had to write a refusal of the offer which was again part of the enterprise work. In this refusal they were supposed to mention some reasonable grounds. Thus the supplier understood the argument and had the possibility to upgrade respectively to correct their offer because the enterprise wanted to continue the business relationship with them. Finally, the students summarised the experience at school.

[8] This is of course also a matter of the different curricula as schools in Germany traditionally have research or science based syllabi during training profiles that are driven by practical problems. See also Sect. 15.3.4.

It can be seen that this is a sequence enterprise-school-enterprise-school with different foci: Starting with orientation in the enterprise where the problem is worked out, the students go to school to gain knowledge to deal with the problem. Then the students have certain experiences in applying the knowledge in a working environment. These have to be generalised. Figure 15.6 illustrates the design of the arrangement:

The effects of this arrangement were documented by comparing the pre-knowledge and post-knowledge structures of the trainees (cf. Sloane 2004, 148f). For the specific argumentation here these effects are not the main point of interest. Here, it is important to point out the working process of developing this type of joint arrangements between schools and enterprises. It has to be seen that this is a long on-going process of co-operation which leads, according to the ladder-model, to co-operation at level 4. The actors establish a continuous programme of developing tasks together.

However, a final point must be made: This kind of co-operation only works and stays stable when somebody organises it. There is a high degree of instability, especially at the enterprises. The actors change, the enterprises re-organise, change their priorities and so on. The schools are relatively stable, but have to deal with the changing modes of the enterprise's actors.

Nevertheless, this can be used as a sophisticated approach which could be possible in a good working co-operation. Coming back to real-life settings in daily work in vocational schools it has to be asked how and to what extent this example can be transferred. A realistic view is necessary.

15.3.4 The 'Lernfeldkonzept' – Realistic Approaches Towards Co-operation in VET[9]

Arguably the most important step of reform in the current crisis has been the so-called '*Lernfeldkonzept*'. The term *Lernfelder* can be roughly translated as 'areas of learning' or *'learning area', which form the basic unit of newly developed curricula for the school part of the dual system.* The concept was introduced formally by a decision of the Conference of Education Ministers (*Kultusministerkonferenz*) in 1998 and revised in 2012 (cf. Dilger and Sloane 2013). It applies the notions of didactic innovations, such as activity-oriented and comprehensive learning, to the context of vocational colleges.

The main idea of this concept is the reconstruction and/or simulation of vocational processes at vocational colleges. Tasks and activities the trainees are typically confronted with in training companies ('working area') are the basis for the

[9] This chapter is based on a number of research projects (NELE, segel-bs, mosel) completed for the Federal Minister of Research and Science and the Ministries of Culture in Bavaria, Hessen and North-Rhine Westfalia between 1999 and 2009. The outline of this chapter was first published by Hubert Ertl and the current author (Ertl and Sloane 2004; see further Sloane 2004).

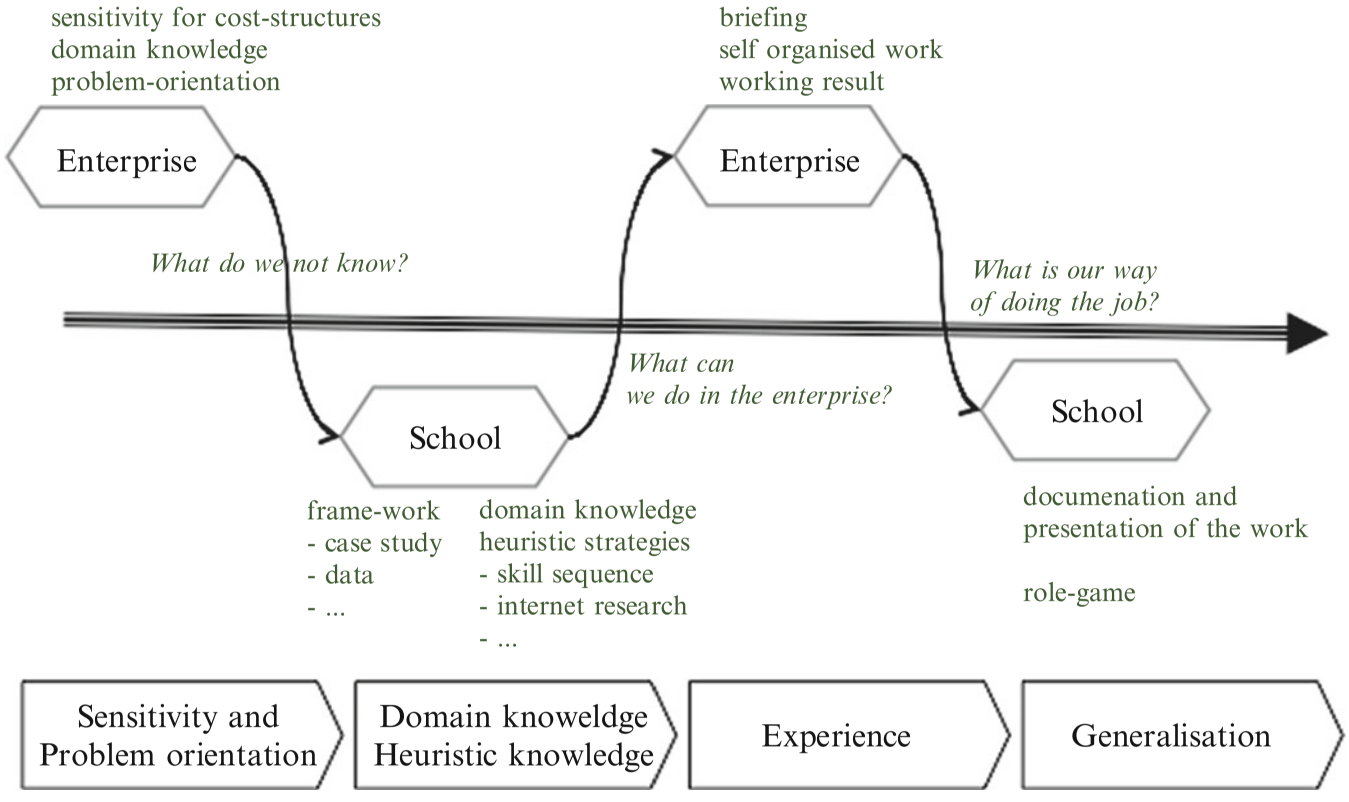

Fig. 15.6 The movement between learning places as a context change

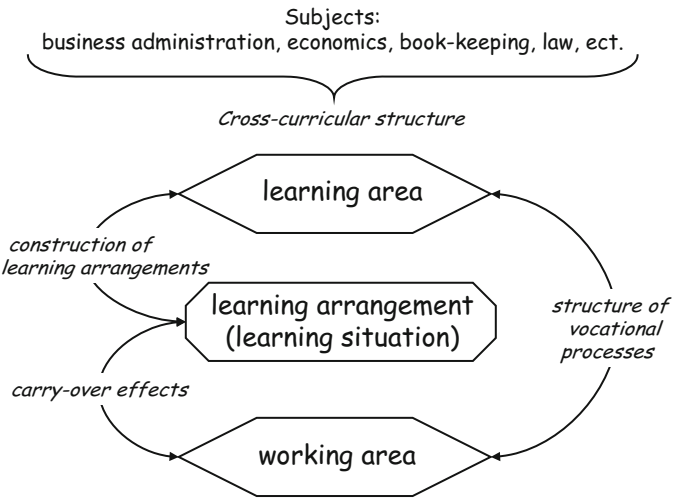

Fig. 15.7 Connection between areas of learning and work contexts

construction of 'learning arrangements' (learning situations at vocational colleges) that constitute an area of learning (Sloane 2001). Learning areas also draw on the knowledge that is represented in conventional school subjects. However, the traditional subjects are transformed into a cross-curricular structure in which comprehensive tasks have to be completed and real-life problems have to be solved by the trainees. Put in a nutshell, learning areas represent pedagogically adapted and enriched vocational processes derived from actual work contexts (Kremer and Sloane 2000, 73). The connection between learning and working areas and the way in which learning arrangements are constructed is illustrated in Fig. 15.7.

There are a number of conditions for the successful implementation of the concept of learning areas. These conditions and the resulting changes in the set-up of college-based training provisions have an impact on the three transfer elements conceptualised earlier. The changes outlined in the following illustrate the interdependence of the transfer elements.

First and foremost, the '*Lernfeldkonzept*' is a *curricular* reform. Whereas curricula for vocational colleges used to be strongly prescriptive in terms of content, aims and time allocated to content and aims, curricula developed on the basis of the concept of areas of learning are formulated in an open way. The processes of curriculum construction are transferred from the state level to the level of individual colleges. This means that actors at the political level, who assumed the responsibility of developing the prescriptive curricula in the past, now only set broad guidelines for the teaching at vocational colleges. On the basis of these guidelines workable aims and operational contents for teaching are developed at the level of the individual colleges.

This means that the work and the role of *teachers* at vocational colleges have changed. The translation of curricula into instructional designs has become part of

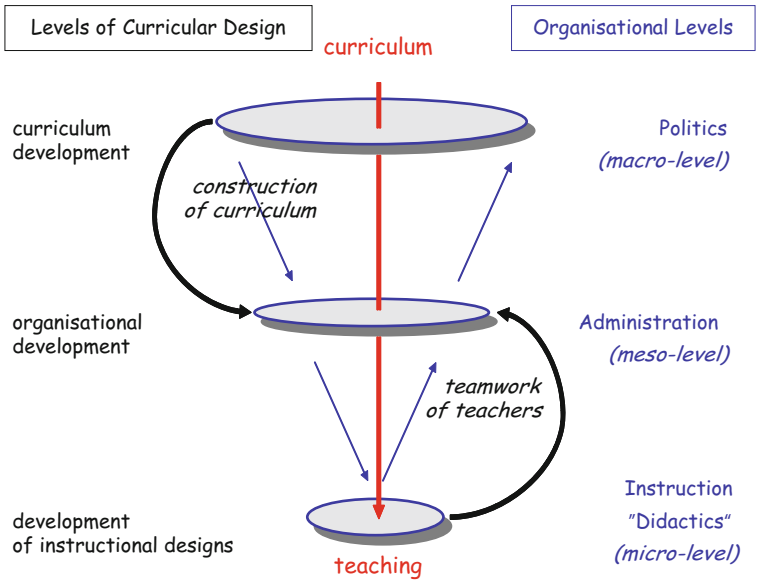

Fig. 15.8 Curricular and organisational changes in the '*Lernfeldkonzept*'

the work of teachers. This task can only be fulfilled through close the co-operation of the teaching staff, which has consequences for the *organisation* of vocational colleges. For instance, teachers have to co-operate as a team in order to develop schedules and lesson plans on the basis of the curricular guidelines.

In summary, the responsibilities of the teachers increase and the tasks they are asked to fulfil become more complex. These are typical indicators of a changing notion of *professionalism* of teachers and of job enrichment. Also, the organisation of colleges has to change to initiate and support the teamwork of teachers. This change is part of a wider reshuffling of responsibilities in the institutional set-up of vocational training. The changes are illustrated in the following figure (Fig. 15.8).

In order to be able to plan teaching and learning processes on the basis of vague curricular guidelines, teachers have to take real-life work contexts into account. As hinted at in the previous section, learning areas represent pedagogically adapted and enriched vocational processes derived from actual work contexts. This means that teachers have to co-operate with training companies while planning their lessons. The long-standing organisational and pedagogical challenge of co-operation between the two main venues of training in the dual system has become more pressing than ever (cf. research documented in Euler, 1999a, b). Keeping in touch with developments in the economy and establishing contact with training companies becomes a central task for vocational colleges and teachers.

15.3.5 Integrated Apprenticeship – A Visionary Approach in VET

As enterprises and vocational schools in Germany are embedded in different institutional settings, co-operation is an organisational reaction to arrange pathways between these two learning places. Dual system indeed does not mean that there is one system with two sides, but rather it correctly implies two systems which have to co-operate.

There have been many discussions in Germany about whether it is possible to establish more access between enterprises and schools by introducing requirements. However, in the end the gap between the two learning places is too wide. As mentioned in Sect. 15.3.2, enterprises and schools are part of two distinctive, even incommensurable life settings.

Nevertheless, at least one of the more visionary approaches should be mentioned. It is an integrated approach towards VET which is found in the area of social and medical services. Medical and social institutes run this kind of concept. Here schools and enterprises are often in one system. In other words: there is no institutional gap.

Similar experiences can be found in new vocational programmes, and joint programmes of enterprises and universities of applied sciences should be mentioned in particular. In all these cases there is an integrated curriculum for the enterprise part as well as the school part of the programme. Thus, an ideal co-operation can be established which strictly follows the idea of an institutionalised partnership programme according to level 5 of the co-operation ladder (see Fig. 15.5).

Figure 15.9 illustrates the main ideas of such a sophisticated approach. It generalises the concept in so far as it adopts the principal aspects of the dual system. In this approach the regulations of the school and the enterprise are linked together on the basis of generalised action fields. This is adopted from the '*Lernfeldkonzept*'. If the regulations for the enterprises (training regulations) and for the schools (framework syllabus) were both based on a uniform framework of action fields this could lead to more coherence between the two learning places. Action fields are typical qualifications, but they could also be defined as competences. The school-based learning tasks and the enterprise-based working tasks could be co-ordinated.

This would then possibly lead to a sequence of learning phases in the school and in the enterprise (like in Fig. 15.6). Nevertheless, a co-operation between teachers and trainers would be necessary. Teachers and trainers would still have to generate tasks resp. instructions, which foster the learners to apply knowledge to diverse situations, let them be work processes or learning situations. Both, work processes and learning situations, can be designed by shared didactical principles. If these learning units are to sequenced beyond the border of an enterprise or a school, then teacher and trainers need to have common ground for their didactical decisions. Generalized action fields that serve as a basis for training regulations (enterprises) and framework syllabus (schools) could be used to come to common understanding about didactical co-operation (Fig. 15.9).

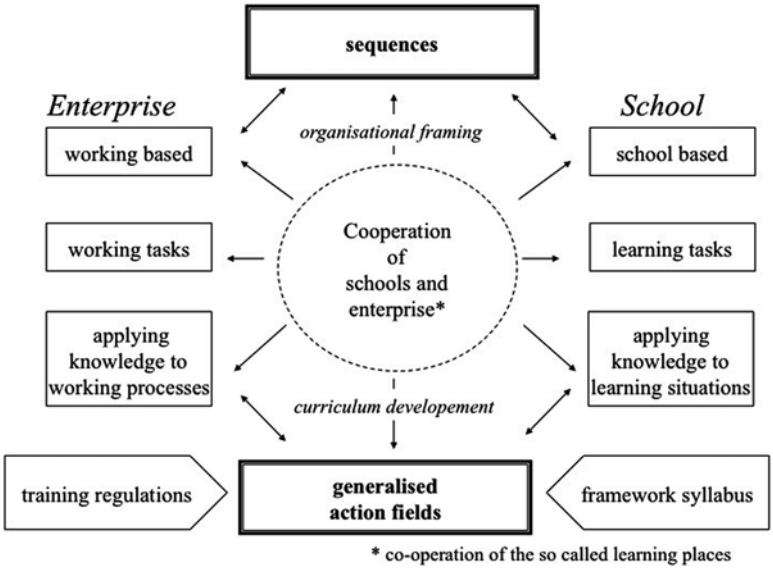

Fig. 15.9 The integrated approach towards VET

15.4 Final Remarks: Behind the Curtain

Finally it is important to examine the discussion of vocational education and training and the emphases made with regard to the dual system. In Germany there is an on-going discussion about the success of this system and a strong belief that this approach should be transferred to other countries. Every once in a while excited statements are made in the media that another country wants to adopt the system. Sometime later the excitement calms down and the country is not further mentioned until a new aspirant is located. In the end the dual system is and remains a German approach and it does not seem to be transferable.

This has something to do with the different layers, which were discussed in this chapter and has to be reflected in the ambivalence of naïve examples, on the one hand, and the also discussed complex framework, which constitutes the dual system, on the other. This framework brings three aspects together: didactics, governance and organisation.

When practitioners or politicians look at the dual system they refer to the organisation between enterprises and schools. They often do not understand that it works on the basis of a German governance approach. That vocational education is, for example, an educational and not an economic model seems to elude them. Something similar, by the way, happens if German politicians reflect on the system. They always point out that the enterprises do sterling work in offering apprenticeships.

That is, of course, a basic decision. By doing this they offer to take on costs for education which in other countries are paid for by the government. However, it

should be mentioned that in a 3-year programme apprentices bring in more profit than they cost after 2 years. The enterprises break even at that point at the latest.

Enterprises and schools co-ordinated to some extent, even if the enterprises and schools are in some particular way incommensurable to each other. That has something to do with the role of vocational colleges, or schools, respectively. In the German perception the enterprises guarantee the success. However, all the experiences mentioned in this contribution show that most of the work is done by the schools. Good co-operation and success in final examinations is always the result of schoolwork.

Therefore it seems useful to think more about the functions of schools in co-operative systems where enterprises and schools work together. This is a matter of how schools apply their work to practical life. Teachers in vocational schools have some kind of external reference because they have to find some pathways into practice. The correct reason for the success of dual apprenticeship, therefore, is not the simple fact of participation of schools and enterprises, but the sophisticated possibilities of linking school work to the practical problems of daily life in enterprises.

To realise these opportunities a specific type of teacher is required who is able to organise co-operation using a didactic approach. Finally, the dual system may seem to be spectacular, but behind the curtain there are hard-working and well-educated teachers doing their work.

References

Achtenhagen, F., & John, G. (Eds.) (1992). *Mehrdimensionale Lehr-/Lernarrangements*. Wiesbaden: Gabler.

BIBB, Federal Institute for Vocational Education and Training. (2009). Datenreport zum Berufsbildungsbericht 2009. Informationen und Analysen zur Entwicklung der beruflichen Bildung. Bonn 2009. Online: http://datenreport.bibb.de/media2009/datenreport_bbb_090525_screen.pdf

Braukmann, U., & Sloane, P. F. E. (1997). *Möglichkeiten und Grenzen der Individualisierung Und Flexibilisierung Der Dualen Berufsausbildung Durch Zusatzqualifikationen*. Jena: Unpublished Report.

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.

Buschfeld, D., & Euler, D. (1993). Kooperation der Lernorte: Theoretische Bezüge und praktische Erfahrungen. Kolorit. *Kooperation der Lernorte im Bereich neuer Informationstechnologien*. Zwischenbericht: Münster.

Deissinger, T., & Hellwig, S. (2005). Apprenticeships in Germany: Modernising the dual system. *Education + Training, 47*(4/5), 312–324.

DESTATIS, Federal Statistical Office (Ed.) (2012). *Statistisches Jahrbuch. Deutschland und Internationales*. Online: https://www.destatis.de/DE/Publikationen/StatistischesJahrbuch/StatistischesJahrbuch2012.pdf?__blob=publicationFile

Diesner, I., Euler, D., Walzik, S., & Wilbers, K. (2004). *KOLIBRI: 'Kooperation der Lernorte in der beruflichen Bildung': Abschlussbericht*. Bonn und St. Gallen: Bundesinstitut für Berufsbildung und Institut für Wirtschaftspädagogik.

Dilger, B., & Sloane, P. F. E. (2013). Kompetenzorientierung in schulischen Rahmenlehrplänen in der dualen Berufsausbildung. Anmerkungen zu den Empfehlungen der KMK zu Lernfeldcurricula. *Die berufsbildende Schule*, 46–49.

Dilger, B., Kremer, H.-H., & Sloane, P. F. E. (2001). Wissensforum als Instrument zur Lernortkooperation. *Wirtschaft und Erziehung*, 21–24.

Eraut, M. (1994). *Developing professional knowledge and competence*. London: Falmer Press.

Ertl, H. (2002). *The role of European Union programmes and approaches to modularisation in vocational education: Fragmentation or integration?* Munich: Utz.

Ertl, H. (2006). Educational standards and the changing discourse on education: The reception and consequences of the PISA study in Germany. *Oxford Review of Education, 32*(5), 619–634.

Ertl, H., & Sloane, P. F. E. (2004, September). Vocational education and training and innovation.

Euler, D. (1999a). *Kooperation der Lernorte in der Berufsbildung. Expertise für die Bund-Länder-Kommission für Bildungsplanung und Forschungsförderung im Auftrag des Bundesministeriums für Bildung und Forschung*. Nürnberg: Lehrstuhl für Pädagogik, insb. Wirtschaftspädagogik an der Universität Erlangen-Nürnberg.

Euler, D. (1999b). Die Lernortkooperation in der beruflichen Bildung. Stand und Perspektiven aus Sicht wirtschaftspädagogischer Forschung, 249–272.

Euler, D. (2011). Wirkungs- vs. Gestaltungsforschung – eine feindliche Koexistenz? *Zeitschrift für Berufs- und Wirtschaftspädagogik (ZBW)*, 520–542.

Euler, D., & Sloane, P. F. E. (1998). Implementation als Problem der Modellversuchsforschung. *Unterrichtswissenschaft*, 312–326.

Gei, J., & Stertz, A. (2010). *Zusatzqualifikationen deutlich erwünscht! Wunsch und Realität aus Sicht der Auszubildenden*. Bundesinstitut für Berufsbildung. Bonn. Online: http://www.ausbildungplus.de/files/aplus_zusatzqualifikationen_aus_azubi-sicht.pdf

Greinert, W.-D. (2004). European vocational training 'systems' – some thoughts on the theoretical context of their historical development. *European Journal Vocational Training*. CEDEFOP, 18–25. Online: http://www.cedefop.europa.eu/etv/Upload/Information_resources/Bookshop/399/32_en_greinert.pdf

Griffiths, T., & Guile, D. (2001). Learning through work experience. *Journal of Education and Work, 14*(1), 113–131.

HELP (Hessisches Landesinstitut für Pädagogik) (Ed.). (2001). *Wissensforum als Instrument der Lernortkooperation*. Modellversuchsinformation Nr. 2 Erhebung der Rahmenbedingungen im Modellversuch WISLOK. Online: http://www.beruflicheschulen-modellversuche.de/fileupload/WISLOK_Flyer_2.pdf

Kaiser, F.-J. (1994, May). *Didaktische Parallelität als Problem der kaufmännischen Berufsausbildung – Erfahrungen aus dem Modellversuch Lernbüro* (pp. 11–25, W. P. Köln, Ed.), No. 16.

KMK, Conference of Federal Education Ministers. (2013). *Rahmenlehrpläne*. Online: http://www.kmk.org/bildung-schule/berufliche-bildung/rahmenlehrplaene-zu-ausbildungsberufen-nach-bbighwo/rahmenlehrplaene.html

Koch, R., & Reuling, J. (1998). Public quality control of vocational training in Germany, France and the United Kingdom. *Vocational Education European Journal, 15*(3), 7–12.

Kremer, H.-H., & Sloane, P. F. E. (2000). Lernfeldkonzept – Erste Umsetzungserfahrungen und Konsequenzen für die Implementation. In R. Bader & P. F. E. Sloane (Eds.), *Lernen in Lernfeldern. Theoretische Analysen und Gestaltungsansätze zum Lernfeldkonzept. Beiträge aus den Modellversuchsverbünden NELE & SELUBA* (pp. 71–83). Markt Schwaben: Eusl.

Kremer, H.-H., & Sloane, P. F. E. (2001). *Lernfelder implementieren. Zur Entwicklung und Gestaltung fächer – und lernortübergreifender Lehr-/Lernarrangements im Lernfeldkonzept*. Paderborn: Eusl.

Kutscha, G. (1995). *General and vocational education and training in Germany – Continuity amid change and the need for radical modernization*. Retrieved from http//:www.uni-duisburg.de/FB2/BERU/download/vocation.zip

Kutscha, G. (2000). *General education and initial vocational training in Germany. The "Flexicurity Route" of modernization under aspects of flexibility, transferability and mobility*. A contribution to COST A11 conference, Working Group 1: VET policy. Retrieved from http//:www.uni-due.de/imperia/md/content/berufspaedagogik/3_kutscha_cost_goettingen_2000.pdf

Lipsmeier, A. (1987). Neue Technologien, Technikwissenschaft und Technikdidaktik in ihrer Relevanz für eine Didaktik beruflichen Lernens. In Verbände der Lehrer an beruflichen Schulen und Kollegschulen in NW (Ed.), *Berufliche Schulen – Multiplikatoren technologischer Innovation* (pp. 42–76). Frankfurt a. M. et al.: Lang.

Nickolaus, R. (2010). Einflüsse der Methodenwahl auf die Kompetenz- und Motivationsentwicklung – eine Übersicht zu Ergebnissen empirischer Untersuchungen. *lernen & lehren*, *25*(98), 56–61.

North, D. C. (1990). *Institutions, institutional change, and economic performance*. Cambridge: Cambridge University Press.

Pätzold, G. (1997). Lernortkooperation – wie ließe sich die Zusammenhanglosigkeit der Lernorte überwinden? In D. Euler & P. F. E. Sloane (Eds.), *Duales System im Umbruch. Eine Bestandsaufnahme der Modernisierungsdebatte* (pp. 121–142). Pfaffenweiler: Centaurus-Verlagsgesellschaft.

Raggatt, P. (1988). Quality control in the dual system of West Germany. Reprinted in D. Phillips (Ed) (1995) *Education in Germany. Tradition and reform in historical context* (pp. 176–202). London: Routledge/Oxford Review of Education.

Sloane, P. F. E. (2001). Lernfelder als curriculare Vorgaben. In B. Bonz (Ed.), *Didaktik beruflicher Bildung* (pp. 187–203). Baltmannsweiler: Schneider-Verlag.

Sloane, P. F. E. (2004). Lernortkooperation als Mittel der schulnahen Curriculumentwicklung. In Dieter Euler (Hrsg.) *Handbuch der Lernortkooperation* (pp. 368–382). Bielefeld: Bertelsmann-Verlag.

Sloane, P. F. E. (2004). The application transfer between school and enterprise in the German dual system – putting it into practice. In R. Mulder & P. F. E. Sloane (Eds.), *New approaches to vocational education in Europe* (pp. 143–156). Oxford: Symposion Books.

Sloane, P. F. E. (2008). *Zu den Grundlagen eines Deutschen Qualifikationsrahmens (DQR). Konzeptionen, Kategorien, Konstruktionsprinzipien*. Bielefeld: Bertelsmann.

Sloane, P. F. E., Twardy, M., & Buschfeld, D. (2004). *Einführung in die Wirtschaftspädagogik*. Paderborn: Eusl.

Stratenwerth, W. (1959). "Betriebsgebundene" und "schulgebundene" Berufserziehung. Eine Analyse der Begriffe. *Die Deutsche Berufs- und Fachschule,* (10), 810–822.

Tuomi-Gröhn, T., & Engeström, Y. (2003). *Between school and work: New perspectives on transfer and boundary crossing*. Oxford: Elsevier Science Ltd.

Twardy, M. (Ed.) (1991). *Duales System zwischen Tradition und Innovation*. Düsseldorf: Müller Botermann Verlag.

Voelzkow, H. (2009). Neokorporatismus. In U. Andersen & W. Woyke (Eds.), *Handwörterbuch des politischen Systems der Bundesrepublik Deutschland* (6th ed., pp. 460–464). Wiesbaden: VS Verlag für Sozialwissenschaften.

Weick, K. E. (1976). Educational organizations as loosely coupled systems. *Administrative Science Quarterly, 21*(1), 1–19.

Winther, E. (2011). Das ist doch nicht fair! – Mehrdimensionalität und Testfairness in kaufmännischen Assessments. *Zeitschrift für Berufs- und Wirtschaftspädagogik, 107*(2), 218–238.