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## Enhancing Permeability through Cooperation

The Case of Vocational and Academic Worlds of Learning in the Knowledge Economy

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### 12.1 Introduction

Like other advanced economies, Germany is currently undergoing a partial transformation from an industrial economy into a knowledge economy.<sup>1</sup> The latter is characterized by an increase in the numbers of both higher-qualified service jobs and knowledge-intensive manual jobs (Protsch and Solga 2015). As Thelen (2019) points out, in collective skill formation systems, this transformation can unfold in very different ways. Germany, for example, concentrates on the adaptation of its traditionally strong industry-based sectors. What most countries have in common, however, is that there is an increase in the demand for more academically oriented qualifications. Job profiles have changed and are becoming increasingly complex. Progressively, cognitive competencies are becoming more important (Baethge and Wolter 2015; Bonoli and Emmenegger, in this volume; Mayer and Solga 2008). These are traditionally competencies associated with an educational pathway in higher general education (HGE).<sup>2</sup>

Technological change, which in Germany is often addressed under the headings digitization, internet of things, or Industry 4.0, further reinforces and accelerates these changes. Forecast research shows that in the next

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<sup>2</sup> HGE refers to academically oriented educational pathways mainly at the upper-secondary level. The prime example of this in Germany is the *Gymnasium*.

decades, a large proportion of jobs will substantially change in their activity profiles due to technological innovations (Arntz et al. 2016; Euler and Severing 2019) resulting in an increasing demand for academically trained workers (Bonoli and Emmenegger, in this volume; Frommberger 2019). This poses a major challenge for vocational training, especially in collective skill formation systems like in Germany, in which high-quality manufacturing has always relied heavily on firm-based vocational education and training (VET) (Thelen 2019). On the one hand, this involves adapting VET to the rapidly changing environment and, on the other, to continue making VET attractive for young, talented people.

In recent years, the challenge of attracting apprentices has been further exacerbated by a change in individual educational-choice behaviour in Germany. As more and more students choose to enter secondary general educational pathways to obtain an *Abitur* (the general higher-education entrance qualification), the proportion of those who begin a vocational training education versus the ones who embark on the academic track has decreased significantly. Since 2011, the majority of school leavers have completed their school careers with a higher-education entrance qualification, predominantly with an *Abitur* (Autorengruppe Bildungsberichterstattung 2018). That is, in 2011, for the first time, university enrolments have narrowly outnumbered enrolments in apprenticeships (Baethge and Wolter 2015). Enrolment in higher education (HE) has grown strongly in recent years, from 20 per cent in the 1980s to 45 per cent in 2016. (Autorengruppe Bildungsberichterstattung 2018: Table F2-2A).

In sum, the historical dominance of VET – and the dual system that combines learning in the workplace and in the school – is being challenged in Germany. Against the background of structural and technological change, institutional permeability between VET and HGE represents one key pathway to reach a higher overall qualification level that can meet the current demand for skills. At the same time, enhanced permeability is an opportunity to demonstrate the attractiveness and the equivalence of VET in relation to HE in view of the challenge employers face in attracting bright and talented students. While we acknowledge the complex relationship between permeability between VET and HGE and the knowledge society and the different consequences it might have on the VET system (Busemeyer and Trampusch 2012),<sup>3</sup> we argue that institutional permeability is a very important aspect that

<sup>3</sup> A historical discourse analysis by Bernhard (2017) shows that enhancing institutional permeability to increase attractiveness of VET is a traditional point of view of VET actors in Germany. However, the fear of an 'academic drift' (Busemeyer and Trampusch 2012) and a loss of trained personnel due to permeability exists, too.

can help cope with the current upskilling challenges collective skill formation systems face.

What exactly can be understood by the concept of permeability and how is permeability made possible through cooperation? In this chapter, we focus on institutional permeability and not social or spatial mobility. The concept of institutional permeability refers to regulative, normative, and cultural institutional structures (Scott 2008) that break up institutional divisions and enable more flexible educational pathways. The question of institutional permeability is essential especially in stratified education systems like the German one that do not connect relevant educational sectors like VET and the HGE well and, thus, are likely to impede equal access to educational and employment opportunities (Bernhard 2017). We analyse actors and institutional structures and how they foster permeability between VET and HGE. It is important to note that the realization of inclusiveness in the form of social mobility builds on such institutional permeability in the education system. Our chapter thus speaks to the emerging literature that links governance concepts with questions of social inclusiveness in education and training (e.g. Powell et al. 2012; Gonon 2013; Thelen 2014; Bonoli and Wilson 2019; Carstensen and Ibsen 2021; Di Maio et al. 2019; Durazzi and Geyer 2020; Bonoli and Emmenegger 2021).

While the challenge to enhance institutional permeability between VET<sup>4</sup> and HGE is increasingly felt by all stakeholders in Germany (Bernhard 2017), the actual building of programmes that promote such permeability is highly demanding as it often requires the cooperation of actors who have been largely isolated from each other and often have diverging interests. This holds true in particular in the case of educational projects integrating both worlds of learning. While various initiatives to increase permeability have been launched in recent years (e.g. Bernhard 2017; Banscherus et al. 2016), little is known about how actors cooperate in the establishment and implementation of these permeability-enhancing projects. To address this research gap, we develop a conceptualization combining institutional permeability and types of cooperation in collective skill formation systems. We systematically link four key permeability dimensions (Bernhard 2017) with the three major types of cooperation that have been identified for systems of collective skill formation: information exchange, coordination, and collaboration (Emmenegger et al. 2019). The combination of these two conceptualizations enables us to explore the intensity of cooperation between key actors from

<sup>4</sup> When VET is mentioned in this chapter we mainly refer to dual VET (i.e., apprenticeship training).

VET and HGE—which contributes to our understanding of how actors in collective skill formation systems adapt to the demands of the knowledge economy.

Our case is Germany, which represents one of the world's major collective skill formation systems, but which is arguably the least successful collective skill formation system in terms of creating a systematic approach to enhancing such permeability (Baethge and Wolter 2015; Graf 2013). However, within Germany, we explore programmes that indeed provide a high degree of permeability between vocational and academic worlds. More specifically, we focus on programmes in which dual VET is systematically combined with the *Abitur*. Our institutional analysis is based mainly on document analysis and expert interviews.

We find that despite different interests, the educational actors in the two separate educational sectors of VET and HGE realized that enhancing permeability with the help of such double qualification programmes can help them to reach their respective goals. This compatibility enables cooperation. In the initiation phase of such programmes, actors of VET and HGE strongly collaborated. However, once the programme is established, constant collaboration is no longer necessary for ensuring institutional permeability. In the case of problems in the day-to-day operation of the programme, actors try to solve these first through information exchange and, if this is not sufficient, through coordination. Over time, this enhances mutual understanding between the actors despite their original position on two different sides of the institutional divide between VET and HGE and their dissimilar interests. Nonetheless, sometimes an incompatibility of interests arises and makes cooperation difficult. We show that increasing permeability is by no means a trivial task and that a fine-grained understanding of both permeability and cooperation can help uncover how actors take a differentiated approach to handling adjustments of collective skill formation to the knowledge economy.

In the next section, we explore what exactly can be understood by the concept of permeability and how permeability is made possible through cooperation, which provides the ground for our analysis of the case of dual qualification programmes. We then outline the institutional division between VET and HGE in Germany before analysing the dual qualification programmes in question and the respective level of cooperation involved in each of the four dimensions of institutional permeability. We conclude by discussing the dynamic relationship between institutional permeability and cooperation in collective skill formation.

## 12.2 Conceptual framework: four dimensions of institutional permeability and their governance through cooperation

In this section, we develop a framework that allows us to capture the cooperation types involved in building institutional permeability between VET and HGE.

### 12.2.1 The four dimensions of institutional permeability

Institutional permeability should not be understood too narrowly, i.e. as just the possibility of transitioning from one educational sector or level to another. Analytically, the concept of institutional permeability can be further differentiated along four dimensions (Bernhard 2017): (1) access, (2) recognition and validation, (3) organizational interlinkages, and (4) institutional support structures to meet the diverse needs of learners.

*Access* to educational programmes and sectors can be unconstrained, without predetermined conditions. Alternatively, access may depend on entitlements based on certificates, like the HE entrance certificate. Finally, the relevant educational organization and participating actors may decide on alternative access possibilities based on, for instance, admission tests or interviews.

*Recognition and validation* of prior learning, as a second dimension, is based on the notion that different learning pathways can lead to equivalent competencies. Here it has to be examined whether and to what extent previously acquired knowledge and skills match those of the target educational course and thus can replace components of the educational programme.

The third dimension of institutional permeability comprises the organizational interlinkage of the educational sectors of VET and of HGE at the organizational and programme level. A distinction can be made here between the consecutive linking of (parts of) educational programmes from different educational sectors (institutionalized transitions) and the linking of different educational sectors within one programme or organization (i.e. linkage through organizational integration) (Bernhard 2017) by offering double qualifications and integrating, for instance, curricula, didactics, methodology, and learning venues (cf. Young et al. 1997). Permeability via integration thus involves breaking down the existing institutional boundaries (Baethge 2006) by institutionalizing the logic, norms, and/or regulations typical of both VET and HGE in one programme. In this

chapter, we mainly refer to this second and stronger form of organizational interlinkage, namely *organizational integration*. A common example for the integration of VET and HE are the dual study programmes in Germany (Graf 2013).

The fourth dimension emphasizes that permeability implies not only securing access or opportunities for recognition and validation, but also supporting diverse learners to enable them to successfully complete the course (Bernhard 2017; Wolter et al. 2014). Hence, it comprises institutional structures aimed at *meeting the heterogeneous needs* of learners. Support structures can take the form of information and counselling services, securing funding for the learners, offering flexibilized learning structures (e.g. blended learning courses) and adapting curricula and didactic orientations.<sup>5</sup>

In sum, institutional permeability implies far more than granting transition opportunities from one educational area to another. Instead, we argue that our multi-dimensional understanding is helpful in uncovering structural conditions for successful learning and increased inclusiveness especially in the context of collectively organized skill formation systems in the era of the knowledge economy.

### 12.2.2 Cooperation on institutional permeability

From a governance perspective, shaping successful learning pathways between VET and HGE is clearly a challenge. The actors in the two different organizational fields of HGE and VET, which have been separated for such a long time, do not ‘speak the same language’ (Baethge 2006). Normally, these actors hardly ever cooperate with each other. For the implementation of a programme located at the nexus of VET and HGE, however, it can be assumed that close cooperation is necessary. At the same time, actors who represent different interests must come together. This includes employers who want to increase the attractiveness of training and seek to train highly skilled workers able to adapt to changing working conditions (Thelen 2014). Trade unions are traditionally interested in ensuring the attractiveness of VET and in maintaining equivalence between VET and HGE, but also that

<sup>5</sup> Hemkes (2018) also develops several types of permeability that comprise the first three dimensions of the framework by Bernhard (2017). The fourth dimension used here relating to the different needs of learners is not used in Hemkes’s conceptualization. However, we contend that this dimension is important because permeability should not only enable transitioning or breaking up institutional barriers but also enable successful learning (Bernhard 2018). Following Bernhard (2017, 2019) and others (Wolter et al. 2014), in our understanding permeability is not sufficiently achieved when, for instance, VET students are allowed to enter HE but systematically fail their studies more often compared to students with a HGE background because of disadvantageous institutional structures.

students and apprentices are treated fairly (Durazzi and Geyer 2020). In Germany, trade unions have been favouring educational programmes that align VET and general education at the secondary level as long as the education is encompassing and not mainly job or firm specific (Bernhard 2017). Actors in HGE itself, like *Gymnasien* and teachers, often defend the social importance and quality of general education qualifications and especially the *Abitur*. This was also evident in the development of the German Qualification Framework (Bernhard 2017). Universities, who increasingly act as political actors in their own right (Graf 2018), aim to enhance their prestige in a competitive HE sector. To a lesser extent, this also holds for schools at the secondary level that seek to recruit talented students. Finally, state actors typically strive for a functioning, coordinated education system that is attractive to their constituents, firms, and citizens, and in which learners complete their training programme and are successful on the labour market (Di Maio et al. 2020).

Thus, actors are traditionally not only separated, but they often also have different interests. But why do they cooperate, nonetheless? Why and to what extent do the actors overcome the challenge of cooperating to enhance institutional permeability? In this context, we need to better understand what such cooperation looks like. For this, we connect the four permeability dimensions with recent research on the type and intensity of cooperation in collective skill formation. Crucially, we contend that the four dimensions of permeability can be linked to different degrees of cooperation between the actors in the respective organizational fields.

To analyse cooperation, we follow Emmenegger et al. (2019: 32–3) in referring to *information exchange*, *coordination*, and *collaboration* as the three core types of cooperation in systems of collective skill formation. This conceptualization is inspired by Buschfeld and Euler's (1994) conception of learning sites cooperation in VET. *Information exchange* is the most basic type of cooperation. The governance of apprenticeship training on its own already requires substantial information exchange among various actors, for instance, about available training places. Crucially, the need for information exchange is further elevated in programmes that aim to connect the previously separated actors from VET and HGE. In turn, *coordination* denotes 'situations in which actors mutually adjust their behaviour upon the exchanged information' (Emmenegger et al. 2019: 13). It means creating alignment of actions and inter-connectivity. The next level of cooperation is collaboration (or co-production), which requires joint activity from the involved actors to achieve

a common objective, like the joint development of the German Qualification Framework (Hemkes 2018).<sup>6</sup>

The three types of cooperation also reflect different degrees (or levels of intensity) of cooperation: information exchange is the weakest and collaboration the strongest form of cooperation. Concurrently, as we show in our empirical analysis, if interests are not aligned between the participating actors, higher degrees of cooperation are more difficult to achieve.

### **12.3 Dual vocational training with *Abitur* in Germany: key characteristics, case selection, and methods**

The institutional conditions within German educational federalism lead to a significant fragmentation in terms of initiatives to enhance permeability. That is, while the German case displays a number of (often individual) programmes and initiatives to enhance permeability, it suffers from a lack of institutionalized structures at the national level (Banscherus et al. 2016). Against the backdrop of such a highly differentiated landscape, acknowledging the decentralized character of educational governance in Germany becomes obvious. In collective skill formation, this typically refers to variation at the regional, sectoral, and occupational levels (Emmenegger et al. 2019). Instead of aiming to fully capture such variety, we zoom in on policy initiatives at the regional level, which address specific sectors and occupations to enhance permeability between VET and HGE. More specifically, we focus on the case in which dual vocational education and training is systematically combined with the *Abitur*. The respective programmes display a high degree of institutional permeability—despite the historically evolved institutional divide between the worlds of vocational and academic learning. We provide an in-depth study of the double qualification programme in Saxony that is referred to as dual apprenticeship training with *Abitur* (Duale Berufsausbildung mit *Abitur* in Sachsen, DuBAS). Essentially, graduates of this programme acquire both the official VET certificate and the *Abitur*. That is, they are eligible to directly enter the labour market as skilled workers and higher VET but also have the same access to universities as graduates of academic upper-secondary schools (e.g. *Gymnasium*). Currently, most initiatives aiming to increase permeability in Germany concentrate on the

<sup>6</sup> Hemkes (2018) is helpful when it comes to connecting the three cooperation types to the topic of permeability but uses a different terminology, which we translate here into our terms.



HE system. One example is dual study programmes, which systematically combine university studies with workplace-based training. In comparison, double qualification programmes combining dual training in firms with the *Abitur* have been extremely rare and are not widely institutionalized education options in Germany. DuBAS thus represents a frontrunner initiative located at the secondary-educational level—combining vocational with academic worlds of learning.

To illustrate the permeability character of this programme, it can be noted that DuBAS differs, for instance, from the vocational baccalaureate in Switzerland or the double qualification offered by the vocational colleges in Austria. The Swiss vocational baccalaureate can be acquired in parallel or subsequently to apprenticeship training. However, it offers direct access only to universities of applied sciences, while its holders have to pass a supplementary examination (known as *passerelle*) if they want to enter standard universities. Vocational colleges in Austria offer a VET certificate and a general HE entrance qualification. Yet, they do not involve a proper apprenticeship training but rather simulated workplace-based learning in school labs, thus reducing the degree of practice orientation and related cooperation challenge. Instead, DuBAS integrates a full apprenticeship with a general HE entrance qualification, which makes it even more interesting for our analysis.

Double qualification programmes at the secondary level that combine some form of vocational education with some form of upper-secondary general education are by now a key topic in collective skill formation systems (Graf 2013; Deißinger et al. 2013a). Studies on permeability between VET and HE argue for an expansion of opportunities to acquire HE entrance qualifications via vocational education and training, in particular through double qualification programmes (Frank et al. 2015; Frommberger 2019). Crucially, such initiatives can be seen to complement adaptations carried out within the VET system that stay within the traditional logic of the VET system (Protsch 2014). In Germany, programmes that combine dual VET with an *Abitur*—i.e. the certificate that grants general access to all HE programmes—existed in the German Democratic Republic but were largely abandoned after reunification (Graf 2013: 104–6). They have also been discussed in (West) Germany since the 1970s (Deißinger 2013b; Wolter 2019: 26).<sup>7</sup> However, they have not yet been widely institutionalized (Frommberger 2019). Until now, only individual initiatives of this kind have been (re-)introduced. Existing programmes

<sup>7</sup> The most influential one, the Kollegstufe in Nordrhein-Westfalen, was a school-based approach of integration of vocational and general education but without direct interaction with the dual VET system (Blankertz and Gruschka 1975).

mainly provide a connection between VET and the entrance qualification for universities of applied sciences (*Fachhochschulreife*, FHR) in a consecutive manner (Deißinger et al. 2013b).<sup>8</sup>

The four-year DuBAS programme, launched in 2011 in Saxony, was one of the first projects after reunification to systematically combine dual VET with the *Abitur*. Since the 2017–2018 school year, six German states have been participating in a similar pilot project that was initiated by the chambers of crafts. These initiatives stand in the same tradition as the older DuBAS programme and are reactions to the challenges the German education system is facing in VET, in particular. The current trend of implementing pilot programmes integrating dual VET and *Abitur* shows that the need to enhance permeability is also acknowledged by VET policy actors (ZDH and KMK 2015; IHK Berlin 2018). Due to a shortage of applicants and skilled workers, firms like to get involved in these projects because in these they see an opportunity to recruit and retain talented young people at an early stage. The chambers worked together with the Standing Conference of the Ministers of Education and Cultural Affairs of the *Länder* in Germany (*Kultusministerkonferenz*, KMK) on the new dual qualification programmes and developed several models that are to be tested at the various school locations (Pollmer and Roser 2016). However, these initiatives are too young to be meaningfully analysed at this point in time. We therefore focus on the case of DuBAS. DuBAS is a regional project that now includes four different schools in four different cities in Saxony covering different occupations.<sup>9</sup> It was successfully integrated into the Saxon education system after the end of the trial period in 2018—allowing us to draw more general conclusions regarding the other, more recent initiatives.

As programmes leading to such double qualifications are rare in the German context and currently undergoing rapid change with hardly any research literature available, we opted for an explorative research design and gathered primary literature and interview data. We conducted semi-structured expert interviews (Meuser and Nagel 2005) of sixty to ninety minutes each with representatives of one training organization, with representatives of the Saxon education ministry, and with representatives in charge of the scientific evaluation of the DuBAS programme.<sup>10</sup>

<sup>8</sup> In 2013, there were more than 1,800 offers nationwide to acquire an FHR as an additional qualification to a vocational qualification, with 9,226 trainees starting this additional qualification (BIBB 2014).

<sup>9</sup> IT specialist or IT system electronics technician, industrial mechanic, tool mechanic, machining mechanic, and industrial clerk.

<sup>10</sup> Interview S1: Dresden, 23 February 2016; Interview S2: Dresden, 23 February 2016; Interview S3: Dresden, 23 February 2016.

In our analysis of the interview data, we applied the tools of theory-guided qualitative content analysis (Gläser and Laudel 2009), combining qualitative content analysis with inductive category formation. Among the overarching categories are the dimensions of institutional permeability and the connected questions of governance and the corresponding barriers or facilitating factors. To complement the interviews, we reviewed existing reports and documents on the DuBAS project, as well as documents and the websites of the participating actors and educational providers. In addition, we checked existing databases that provide relevant information on the VET–HGE nexus (e.g. the *ausbildungplus.de* database of the Federal Institute of Vocational Education and Training).

## 12.4 Case study: integrating vocational and academic worlds of learning

In this section, we first analyse in more detail the traditional division between vocational and academic education in Germany. Then, we introduce the Dual Vocational Training with *Abitur* in Saxony (DuBAS) in the context of institutional permeability. Next, we trace the historical evolution of this programme. In the main part, we apply our conceptual framework to the empirical case.

### 12.4.1 Institutional division between HE and VET in Germany

The German education system is characterized by a historically evolved, institutionalized division between VET and general education (including HE), resulting in two distinct ‘institutional orders’ (Baethge and Wolter 2015). The differences between these institutional orders can be identified along several lines: first, in their respective governance structures (corporatist actors on the VET side and mainly state actors on the academic side); second, in how they are financed (private and public vs. largely public financing); third, in the status the learners hold during their studies (paid apprentices vs. students/pupils); and lastly, regarding the learning venues (workplace and school vs. only school) (Baethge 2006; Baethge and Wolter 2015).

The renowned German VET system has grown mostly separately from HGE, leading to limited direct pathways in particular for the vocationally qualified individuals to HE. Access to HE in Germany is usually secured via

general education. Here, two major types of HE entrance qualifications can be differentiated: the general higher entrance qualification, also referred to as *Abitur*, which allows entrance to all HE institutions, and the FHR that only allows access to universities of applied sciences (Fachhochschulen).

The ‘general institutional logic of segregated learning’ (Powell and Solga 2011: 54) in Germany, which begins with dividing students at an early age (between 9 and 11) into different tracks, has served to maintain and strengthen the strong divide between HGE and VET, as each track typically leads to one or the other educational career. The tracks that end after lower-secondary schooling traditionally lead to VET. The academic high school track—often realized in the *Gymnasium* or the *Berufsgymnasium* (vocational *Gymnasium*), where the students receive the *Abitur* or FHR respectively—leads primarily into HE. Accessing the HE system via the VET track has been difficult. VET graduates usually re-enter the general education system and pass their *Abitur* or FHR. Other possibilities, like entrance tests or study trials, are dependent on the existing regulations of the HE laws of the sixteen German states and tend to differ significantly at state and local levels (Ulbricht 2016).

The early tracking in schooltypes after primary education and later in VET and HGE leads to social segregation (Shavit and Müller 2000) and is mirrored in the high social selectivity in access to the HE system (Reimer and Pollak 2010). Thus, from a social inequality perspective, the question of permeability is particularly crucial in education systems that can be described as highly tracked as the German one (Kerckhoff 2001).<sup>11</sup> Without adequate forms of permeability, systems that build on early tracking can ‘lock in’ individuals into specific educational paths, preventing flexible transitions into other paths. This is particularly problematic in the context of the rising knowledge economy which pushes individuals as well as employers to continuously upgrade their skills portfolio (Powell and Solga 2011).

In recent years, several institutional changes to further institutional permeability between VET and HE have taken place mainly at the post-secondary level (Bernhard 2017; Banscheraus et al. 2016). A paradigmatic change happened when access into HE was liberalized in 2009 by the KMK and for the first time higher VET qualifications entitled individuals to enter HE without *Abitur* or other further examinations (KMK 2009). Graduates of initial

<sup>11</sup> Not surprisingly, there is a wage premium for academically qualified individuals in Germany. However, it is, on average, lower than in systems without strong tracking structures and a well-established VET system (Powell and Solga 2011). In relative terms, income inequality is less structured by the divide between academic and non-academic jobs in Germany compared to many other countries. Nonetheless, the societal status of the academic pathway is higher than that of the vocational one, as recent survey results have shown again (Bergerhoff et al. 2017).

VET can now enter HE study programmes that are connected to their VET discipline if they have acquired at least three years of professional experience after VET graduation. However, they usually must pass an entry exam or can only enter in trial studies in which they have to perform well in order to be able to keep on studying. It should be noted that in 2016 only around 2.5 per cent of all students in Germany accessed HE without *Abitur* or FHR (Statista 2019). Programmes that support permeability from HE to VET for those who drop out of HE are also beginning to be established. Furthermore, since 2002, 50 per cent of a study programme can be validated via the recognition of prior non-academic learning (see Maurer, in this volume). However, no standardized procedures of recognition exist (Hanft and Müskens 2019). In the following, we focus on the case of institutional permeability related to dual qualification programmes.

### 12.4.2 Introducing dual vocational training with *Abitur* in Saxony in the context of institutional permeability

DuBAS is a four-year double-qualifying educational programme linking dual vocational training (involving learning in the workplace and the vocational school) with the *Berufsgymnasium* in Saxony. By integrating both pathways, DuBAS is two years shorter than the consecutive completion of both programmes. In the course of their studies, the students/apprentices repeatedly switch between the learning environment of the firm and school. They learn in blocks, which usually last several weeks, in one of the two environments. They take part in the intermediate and skilled worker examinations as well as the central *Abitur* examinations (Musch 2016; SMK Sachsen 2013).

DuBAS opens up access both to occupations for which a certified VET programme is required as well as to HE—i.e. it offers permeability in both directions. DuBAS is especially interesting to investigate from the perspective of institutional permeability as the integration of VET and the *Abitur* in a single educational programme removes institutional separation at an early stage. Double qualification programmes can be differentiated in consecutive programmes and integrated programmes. DuBAS is an example of an integrated programme, which requires bringing the actors of upper-secondary general education and VET closer together and is, hence, challenging in terms of its governance. It enhances institutional permeability not only between VET and HE but also at secondary level between VET and upper-secondary general education.

Since DuBAS begins at the upper-secondary level and has as its target group students at the lower-secondary schools rather than at the *Gymnasien*, this model is particularly interesting in view of equality of educational

opportunity. Research has shown that in Germany an admission to a *Gymnasium* and thus the acquisition of the *Abitur* is strongly dependent on the socio-economic status of the parents (Hillmert and Jacob 2010; Schindler 2015). This selection hurdle could be lower in DuBAS.<sup>12</sup> Moreover, this programme appeals to individuals who require a stable income early on (by preference or by circumstance).

By recruiting students from less prestigious lower-secondary schools and not from *Gymnasium*, the DuBAS programme is an attractive option for students with a lower socio-economic status (SES) and can enhance social mobility. However, here the target group for institutional mobility is not the most vulnerable youth who may fail to get access to decent education or training opportunities. Rather, DuBAS is a way to address those young people who would have a good chance of securing a regular stand-alone apprenticeship but who feel the pressure of upskilling in the knowledge economy. In this way DuBAS can offer upward social mobility for talented students while bringing them into—and potentially keeping them in—the dual VET system. It is for these people who were tracked into the vocational road outside the general *Gymnasien* but are both vocationally interested and academically talented that a programme like DuBAS offers a promising pathway into a dynamically evolving labour market. If the alternative for these young people is to opt for a purely academic education, this would be disadvantageous for VET as it would lose touch with an important pool of talent.<sup>13</sup> At the same time, the combined skills sets that students acquire in a programme like DuBAS are suitable for the knowledge economy (especially in a country like Germany with its bias towards advanced manufacturing) if such programmes successfully integrates both worlds (vocational and academic).

### 12.4.3 The historical origins of the DuBAS programme

In 2011, the DuBAS project started at two vocational school centres in Leipzig and Dresden for two IT<sup>14</sup> and three metalworking professions.<sup>15</sup> Meanwhile, it is also possible to enter an apprenticeship as an industrial clerk, a vocation

<sup>12</sup> Until now, research data on the students' SES enrolled in the DuBAS programmes is nonexistent. However, the interviewees indicated that the participants primarily come from supportive parental homes with an affinity for practical professional activities. That is, they do not regard *Gymnasien* as the only possible route to professional success (Interview S3).

<sup>13</sup> In the DuBAS programme there is always the possibility to change to the academic track at the *Berufsgymnasium* or on to the vocational track and staying with the firm for an initial VET degree in case the double qualification programme turns out to no longer fit the student's wishes and performance. This construction offers a safety net so that students do not have to drop out and firms also do not (completely) lose their investment in the VET-oriented students (Professur für Didaktik des beruflichen Lernens der TU Dresden 2010).

<sup>14</sup> IT specialist or IT system electronics technician.

<sup>15</sup> Industrial mechanic, tool mechanic, and machining mechanic.

with greater demand among female students (Interview S3). The starting point of the programme was the demand for skilled workers, especially by small and medium-sized enterprises (SMEs) in Saxony, in particular in the science, technology, engineering, and mathematics (STEM) sector ([Professur für Didaktik des beruflichen Lernens der TU Dresden 2010](#)). For this reason, the chambers, on behalf of SMEs, were important partners in the DuBAS project from the very beginning (Interviews S2, S3). The main interests of the employers and chambers to institutionalize the programme is therefore to attract motivated future employees to their firms at an early stage and plan their careers together. SMEs in particular have difficulty in retaining well-trained specialists, e.g. from universities. With the increasing importance of school certificates qualifying for HE and the trend towards dual study programmes, DuBAS aims to increase the attractiveness of initial VET, and, in particular, of some less popular but important and cognitively demanding training occupations (Interview S3, [Musch and Hortsch 2016](#)). In the process of the establishment of DuBAS, the chambers helped select the sectors and occupations and in finding the firms for the pilot. They also cooperated with the different stakeholders in defining the learning block structure and thus also on the distribution of time spent in school and in firms.

The DuBAS programme, initially being a school trial, was conceived in cooperation with vocational educational scientists from Technical University Dresden (TU Dresden) and the Saxon Ministry of Education (Staatsministerium für Kultus) who had just previously reformed the *Berufsgymnasium* in Saxony. The State Ministry of Education was interested in developing a new programme that fitted into the educational architecture of Saxony. The new training course was intended as a possible step towards the vocational academy (*Berufsakademie*) in Saxony which at that time requested the *Abitur* as an access requirement.<sup>16</sup> At the same time, the popular technical universities of applied sciences preferred students with an *Abitur*, too. Thus, if the new educational programme was to be competitive, it had to be possible to acquire the *Abitur* and not just the FHR (Interview S2).

The DuBAS project was, hence, established through strong cooperation between several actors: in particular, the chambers as mediator for the SMEs, the State Ministry of Education, the selected *Berufsgymnasien*, and local vocational education scientists. There were different reasons and interests among the actors to initiate such a common educational programme.

<sup>16</sup> The Saxon vocational academy offers dual study programmes that are practice-integrated and end with a bachelor's degree and not with a double qualification (dual apprenticeship and bachelor).

However, these were compatible to the extent that a joint DuBAS programme, on the one hand, maintains the importance of HGE and, on the other hand, makes VET attractive and helps to address the demand for upskilling and the shortage of skilled workers. Eventually, from the perspective of the federal state it creates an attractive, functioning educational programme that also helps to render Saxony attractive as a business location and fits into its educational landscape. However, to make the programme work, it is still necessary to overcome cooperation problems.

#### **12.4.4 The four institutional permeability dimensions in DuBAS and its governance**

We next use the multi-dimensional permeability heuristic to investigate DuBAS to determine which dimensions of permeability are promoted and how. Combining it with the types of cooperation, we can analyse how institutional permeability between VET and HGE is organized in the DuBAS programme. Our focus is on institutional permeability at the upper-secondary level as the programme is institutionalized on this level. Yet, since DuBAS per se also enhances permeability to the post-secondary level due to the offered double qualification, we also briefly review to what extent and how permeability to the post-secondary level is enhanced through the cooperation of the actors.

##### **12.4.4.1 Access to education**

Access to a DuBAS course is granted to those students who also meet the admission requirements for a *Berufsgymnasium* (Musch 2016). Thus, here the respective regulation of the general education system is decisive. However, at the beginning of the second year, students must have found a firm to train them. The firms decide who is to be trained and stay within the programme. It is therefore a two-step procedure in which the governance regulations of both the school and the vocational training side are applied regarding access to DuBAS. That is, actors from both VET and HGE secured their influence over the selection of the students to ensure the quality of the programme. In the implementation of the access dimension, corporate actors and school actors do not cooperate very strongly with each other. However, in some cases, firms ask the schools about possible promising apprentice candidates (*information exchange*) and the schools sometimes coordinate with the chambers to assist students with their search for an apprenticeship place (*coordination*).



#### 12.4.4.2 Recognition and validation

Questions of recognition and validation had to be clarified during the joint conception of the DuBAS programme. Here a close *coordination* of the participating actors was necessary, given that the two programmes with a duration of three years each needed to be shortened into a programme of four years. However, there were no concrete attempts to validate professional practices and competencies learned in the firms regarding the school-based learning at the *Berufsgymnasium*. In fact, accreditation was limited to the school-based part of dual VET with regards to the requirements of the *Berufsgymnasium*. For the actors representing general education (*Berufsgymnasien* and the Ministry) it was particularly important that there should be no major deviations from the exact timetable of the *Abitur*, which is determined by the KMK (Interview S1, S3). The fear was that the certificate would not be recognized nationally as a real *Abitur*. However, the chambers emphasized that the criteria of the final exams of the VET diploma also need to be met without any concessions. The resulting strict regulation of the number of hours is also a reason why other models, such as the vocational baccalaureate in Switzerland and Austria, are not regarded as equivalent to the German *Abitur* or *Fachhochschulreife* by parts of the KMK, and partially why the Swiss and Austrian models are also not used to advertise DuBAS (Interview S3). Today, in the day-to-day operations of DuBAS, issues around validation rarely occur.

#### 12.4.4.3 Organizational integration

The DuBAS programme systematically combines the learning contents and venues of vocational training with those of the upper-secondary general education of the *Berufsgymnasium* into one programme and makes it possible to obtain a double qualification. Thus, the competences acquired at school are enriched and applied through recurrent practical experiences in firms. This mutual reflection of practice and theory was assessed by the students as particularly positive and represents a strong indicator for the potential success of these integrated educational pathways, in contrast to consecutive ones (Interview S1, S3).

Crucially, *collaboration* by the involved actors was necessary to create this programme. When actors decided to build an integrated double qualifying programme, they had to *collaborate* intensely on what the programme should look like: they decided on the occupational sectors, the curricula, the time schedule (length of block structures), and the financial aspects (apprentices get paid from the second to the fourth year).

When looking at the day-to-day practice and the implementation of the curriculum, continuous *coordination* between the teachers involved in the

vocational school and *Berufsgymnasium* (in all subjects) as well as the in-firm trainers is crucial (SMK Sachsen 2013, Interview S1). For instance, schoolteachers turn to the firms to *inform* them about a perceived lack of practical knowledge of the trainees, while the firms point out the lack of theoretical or basic knowledge. One reaction to such *feedback processes* was the adaptation of corresponding learning units in the schools (Interview S1). The two spheres of learning in the firms and in the school stay mostly separate but actors are involved in *mutual feedback processes* regarding students' development and the working structure of the programme. Nonetheless, the students do the main boundary work in combining what they have learnt in each venue.

A further example of *coordination* is that the blocks of time spent in firms and at school were adapted in one school after the firms criticized the existing structure. The interests of the firms, in particular the SMEs, are that students stay for a longer period of time in the firms so that they can be a productive workforce and are able to learn about the whole work process. The school-side, however, feared that the quality of the education would suffer and that the students could fail more easily because too long a time away from school makes it difficult for the students to start where they left off. Eventually, a compromise could be found through intensive *coordination* (Interview S1, S3).

#### 12.4.4.4 Dealing with heterogeneous needs

When analysing support structures dealing with the heterogeneous needs of the learners and the related actors' cooperation, we found that the DuBAS programmes offer various counselling, information, and support services which are intended to help participants to succeed. Since this is a relatively new educational programme, information and counselling services that draw attention to DuBAS are important. This is done in a *coordinated* way. All the relevant actors in both VET and general education are involved in these activities (Interview S1).

The DuBAS programme can be regarded as rather demanding since the time burden on students is high. In addition to this, the constant re-orientation from school to professional requirements is described as very challenging (Interview S3). To cushion these burdens, support structures in the form of trust teachers were set up in the course of the training itself to help with problems at school or in the firms. This structure is mainly situated in the school but is thought to assist individual students in relation to the whole programme. In this context, *information exchange* between firms and school takes place and sometimes *coordinated* action too.

Finally, continuous, systematic meetings between firms and schools are held to draw attention to problems and difficulties within the educational programmes (Interview S1, S3). Here *information* is not only *exchanged*, but possible measures to ameliorate the educational situation for the actors and students involved are discussed and then implemented. For this, *coordination* between the actors is necessary.

#### 12.4.4.5 DuBAS and permeability to the post-secondary educational level

After the successful completion of the DuBAS programme, the double qualification dual VET with *Abitur* opens up possibilities to access both higher VET as well as HE institutions. Institutional permeability regarding access is thus secured. Since the double qualification legally entitles the students to enter both higher VET and HE, cooperation after graduation is not necessary for the respective actors. Currently, no concrete cooperation is taking place with actors of post-secondary educational organizations either regarding validation of competencies, support structures, or in the form of institutionalized linkages to specific organizations. Cooperation in DuBAS thus mainly takes place between actors at the secondary level. Hence, in the DuBAS programme itself, specific counselling on the various educational opportunities with this certificate in HE or higher VET remains limited, i.e. no explicit support structures to facilitate transitions after graduation are in place. Only the obligatory vocational counselling takes place. As became clear in the interviews, opinions amongst the actor-types differ strongly in these matters. For instance, while schoolteachers ask why it would be necessary to work hard to obtain the *Abitur* if a transition to HE is not intended, the firms do not see HE as the necessary next step but more as an option for the future (Interview S1, S2). Many schoolteachers see studying as the natural next step after graduating with the *Abitur*, while for firms DuBAS is mainly a way to keep talented youth in the VET system. The scientific monitoring of the DuBAS project has shown that more than half of those surveyed plan to take up studies immediately after graduation (Musch 2016), a fact that is partly dissatisfying for the firms trying to retain their students. However, the employers hope that DuBAS graduates are more likely to consider coming back after studying (Interview S2). With this in mind, the participating *Berufsgymnasien* tend to act with caution and avoid displeasing firms or chambers by proactively promoting HE pathways. Thus, while no collaboration between the DuBAS stakeholders takes place concerning educational pathways after graduation, the schools still act with their corporative DuBAS partners in mind. Hence,

actors at the post-secondary level still act in a *coordinated way* in order to secure the viability of the DuBAS programme.

#### 12.4.4.6 Key findings and summary

The DuBAS programme enhances institutional permeability between VET and HGE in all four dimensions, in particular regarding organizational integration at the upper-secondary level and access to higher VET and HE. In addition, the high demands of the programme for the individual learners are considered by way of institutionalizing support structures. Nevertheless, it is the students who must do the main boundary work of combining the two worlds of learning in practice.

Table 12.1 illustrates the types of cooperation paired with the permeability dimensions for the time of the initiation of DuBAS as well as the time of implementation, i.e. its day-to-day operation. We find that during the

**Table 12.1** Key examples for permeability between vocational and academic worlds of learning—a multi-dimension analysis of the DuBAS case

Cooperation		Dimensions of permeability			
Intensity	Type	Access	Recognition and validation	Organizational integration	Support for heterogeneity
Low	Information exchange	Exchange to find apprentices/apprenticeships	Exchange on crediting decisions regarding the programme curriculum (during initiation)	Exchange on curriculum and learning structure	Exchange regarding counselling and trust teachers
Medium	Coordination	Schools coordinate with chambers to assist students with their search for apprenticeship places	Curriculum adaptation of the school part to reduce the overall length of the programme (during initiation)	Implementation and adaptation of the curriculum and learning structures; institutionalized transitions for dropouts	Advertisement of the programme; institutionalized coordination between schools and firms (e.g. counselling services)
High	Collaboration			Setting up of the overall programme	

initiation phase, the actors of VET and HGE needed to strongly collaborate to set up this programme. To overcome the long-standing institutional division between vocational and academic worlds, the most demanding form of cooperation was necessary. Here the focus was on integrating the different qualifications, venues, timetables, modes of finance, and curricula into one programme (*organizational integration*). In particular, questions around curricula and what could be validated presuppose intense negotiations (*recognition and validation*). However, the strict requirements for the *Abitur* prevented stronger curricular collaboration and integration beyond the vocational school part.

Constant collaboration to ensure institutional permeability seems not to be essential once the programme is established. For instance, access is regulated in a consecutive way leaving the control in the hands of both the stakeholders of VET and HGE. However, we find that if problems or difficulties in the programme occur—e.g. regarding the search and recruitment of apprentices (*access*), the proper measurement of learning blocks (*organizational integration*), or the competence development and learning processes of the students (*support for the learners*)—the actors come together and try to solve the problems first through information exchange and—if that is not sufficient—through coordination. The problem-solving takes place with the help of institutionalized cooperation forms like regular meetings or spontaneously when difficulties arise. But since learning venues stay relatively independent from each other, these are rarely collaborative activities. Rather, by using information exchange and coordination, most of the problems are then tackled in the respective venues.

The main actors involved changed between the initiation phases and day-to-day practice. During the establishment of the programme, the chambers, on behalf of the firms, the Ministry of Education, the schools, and the scientific experts were the main actors involved. After DuBAS was set up, the cooperation was more localized between the firms, the respective schools, and sometimes the chambers since the reasons for the cooperation were situated less on the governance level of the overall DuBAS programme in Saxony but were linked more to specific local and sometimes individual problems in the schools and firms.

## 12.5 Outlook

As collective skill formation systems adapt to the knowledge economy, the question of institutional permeability between vocational and academic

worlds of learning has become increasingly salient. While the challenge to enhance institutional permeability is felt by all stakeholders, the actual building of programmes that promote such permeability is highly demanding as it often requires the cooperation of these actors from two different fields and their respective—and at least partially conflicting—interests. This is even more true in the case of educational projects integrating both worlds of learning into one programme, as in the case of double qualification programmes like DuBAS. Yet, these initiatives provide several advantages. They can create institutional permeability, can enhance the attractiveness of initial VET, can help firms to recruit skilled workers at an early age, and can increase equality of educational opportunity since they are tailored to be within reach for students from less prestigious lower-secondary schools as well.

We asked in which ways the DuBAS programme provides institutional permeability and how and why the actors of VET and HGE cooperate to enable the programme. For this purpose, we developed a conceptual framework that allowed us to capture the cooperation types involved in building institutional permeability between VET and HGE. We find that DuBAS, which promotes a polyvalent skill set well suited for the demands of the knowledge economy, enhances institutional permeability between VET and HGE in all four dimensions: DuBAS provides access to higher VET and HE. The programme itself promotes organizational linkages by integrating dual VET and the *Abitur*. During this process also questions of what can be recognized and validated to integrate the curricula and decrease the programme length were answered. Finally, it is acknowledged that the integration of VET and HGE is also challenging for the students who must shoulder the main burden of the boundary work. Therefore, the stakeholders institutionalized support structures that help students to successfully graduate.

We find that programmes such as DuBAS present all the stakeholders involved with numerous challenges but also opportunities. On the one hand, the integration of VET and HGE is very demanding for everyone involved. On the other hand, it can be asserted that the added value of this form of training lies precisely in overcoming potential conflicts based on the different interests of the various actors. In this context, relying on less demanding forms of cooperation can be an option where compromise is difficult to reach. Collaboration (the most demanding level of cooperation) took place in the phase of initiation. The program was then set up in a way that its further implementation is mainly based on information exchange and coordination. Our case study thus suggests that in the initiation phase

of such a permeability programme, actors of VET and HGE need to collaborate strongly. However, constant collaboration to ensure institutional permeability is not a necessary condition once the programme is established. That is, once governance challenges arise in the implementation, actors can come together and try to solve the problems first through information exchange and, if this is not sufficient, through coordination. Over time, information exchange and coordination can enhance mutual understanding of the actors involved from the two sides of the institutional divide between VET and HGE and thus help to overcome taken-for-granted assumptions on the respective sectors, which is arguably a key condition for the successful institutionalization of permeability-enhancing programmes in the long run.

Another important feature of DuBAS is its orientation to the needs of the local economy. Further research could consider in more detail the regional composition of employers regarding such permeability measures. Especially SMEs can be strong partners in the development of dual qualification programmes. While it is mainly large firms that benefit from rapidly expanding dual study programmes (Graf 2018), SMEs are often left on their own in their struggle to cope with the shortage of skilled workers. Programmes such as DuBAS offer the advantage that they allow SMEs to recruit talented young people, while also being attractive to larger firms. Thus, it seems politically possible to form coalitions among SMEs and larger enterprises around such programmes—together with other stakeholders at the respective regional, sectoral, and occupational levels. However, it should be borne in mind that—given the complex decentralized governance configuration of collective skill formation—increasing permeability is not a trivial task. This implies that a fine-grained understanding of both permeability and cooperation is needed to capture how actors work to adjust collective skill formation to the knowledge economy.

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COLLECTIVE SKILL  
FORMATION *in the*  
**KNOWLEDGE ECONOMY**

*edited by* GIULIANO BONOLI  
PATRICK EMMENEGGER



# Collective Skill Formation in the Knowledge Economy

*Edited by*

Giuliano Bonoli  
Patrick Emmenegger

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