



# The Origins and Contemporary Development of Work-Based Higher Education in Germany: Lessons for Anglophone Countries?

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## INTRODUCTION

Today, higher education is typically seen as offering the most assured pathways to secure careers and low unemployment rates. Yet, increasingly some groups, not least higher education graduates and their families paying ever-higher tuition fees, question the taken-for-granted contributions higher education makes to individuals and society as a whole (Schulze-Cleven 2017). Despite decades of mass higher education expansion (Trow

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E. Knight et al. (eds.), *Equity and Access to High Skills through Higher Vocational Education*, Palgrave Studies in Adult Education and Lifelong Learning,

[https://doi.org/10.1007/978-3-030-84502-5\\_7](https://doi.org/10.1007/978-3-030-84502-5_7)

1973), even societies with strong systems continue to struggle to achieve their goal of universalizing participation and equalizing access (Smelser 2013). While in part this is due to limited public or corporate funding for (affordable) study opportunities, differentiated systems, such as in the USA, also lack policy coordination and effective governance, providing a surfeit of options (Labaree 2017; Meyer 2017). While participation rates have climbed worldwide, higher education systems continue to produce winners ('insiders') and losers ('outsiders'), even as the 'schooled society' shifts the occupational structure upward (Baker 2014). Furthermore, market-oriented higher education systems face increasing privatization, which also involves financializing university governance (Eaton 2017). Many states have retrenched investments that had once underwritten universities' flourishing and their moves towards massification. Tensions have deepened over who should pay for rising costs (Garritzmann 2017), exacerbated in an era of increasing status competition via higher education. In the face of such challenges globally, which alternatives exist?

A prominent possibility, pioneered in Germany in the 1970s, is 'dual study' programmes offered by several organizational forms, from vocational academies to universities of applied sciences. Such hybrid programmes fully integrate phases of higher education study and paid work in firms. Participants maintain multiple status, as they are simultaneously higher education students and trainees in firms as paid apprentices. In the short term, firms receive inexpensive but usually energetic labour. In the medium term, they benefit from personnel trained in the relevant context, while those who leave for other firms further expand the firm's network, often with important suppliers. Yet firms not only invest in selecting, recruiting, and training motivated future full-fledged employees, they also collaborate with higher education institutions to develop relevant curricula that promise to craft skilled workers with the skill set and, more than that, the ability to continue learning, that they will need in future. In such programmes, employers and educators cooperate to provide the curricular designs and the specific course work in 'dual' learning settings: on campus and in the workplace. Together, they shape a labour force oriented towards current challenges and opportunities in specific sectors, such as engineering, computer science, or business and economics. As these economic sectors have grown and skill demands rise, so too have dual study enrolments expanded dramatically, becoming more attractive. Currently many programmes are sought-after, even by the most advantaged secondary school leavers who aspire to careers with leading companies. In turn, graduates of

these programmes are attractive employees, not only in the firms in which they were trained (Krone et al. 2019).

Innovatively, dual study programmes systematically combine study (theory) and work (practice) phases in the process of attaining educational qualification(s). The term ‘practice’ is used to denote the structured learning experience in the workplace, whereas theory denotes learning within higher education institutions. As boundary spanning programmes, dual studies integrate elements of vocational training and of higher education, especially with regard to curricula, teaching staff, and funding. In coordinated ways, they connect the learning environments of firms and higher education institutions. Ideally, this establishes a varied but interwoven offering of settings to help master and integrate theoretical and praxis-based dimensions of the same subject. Concretely, academic organizations and firms work together when designing training curricula and administering programmes. What distinguishes German dual study programmes from work-based higher education in most other countries is the central importance given to the practice portion, which typically accounts for around half of the overall programme while being systematically integrated into the curriculum. Theory and practical phases often alternate in several-week increments, with the practical phases providing more synergies than the typical short-term internship separate from academy-based insights. Significantly reducing the financial challenges many students face, especially those from lower socio-economic status families, they earn wages throughout their studies, including the theory phases, as they are formally employed by firms for the duration of their studies. Such programmes become increasingly attractive for all youth as they transition to adulthood, especially in times of economic recession, such as that experienced globally in 2009. It seems likely this will also be true in the aftermath of the Covid-19 pandemic.

Different types of dual study programmes with special profiles exist (Graf et al. 2014). Students enrolled in dual study programmes that integrate a full-fledged apprenticeship programme (so-called *Ausbildungsintegrierende* programmes) earn a recognized vocational training certificate and a bachelor’s degree simultaneously. Alongside this original type, several other dual study programmes (a) offer extended periods of practical training within a firm or (b) allow working individuals to combine their part-time work with academic studies. Graduates of these latter types earn one degree (usually at bachelor level). Regardless of these options’ particularities in working time and degrees earned, to a great

extent, employers determine the quality of training. Importantly for the cross-institutional negotiations and cooperation agreements, as well as the selection processes, the firms active in offering dual studies include the most highly reputed companies in Germany, from Adidas to Volkswagen. They are often, but not exclusively, large firms that have considerable internal labour markets and professionalized human resource departments capable of screening, selecting, and supporting the best secondary school graduates from each cohort. These students, often among the strongest graduates of local schools, succeed in these high-paced study programmes that also often demand considerable spatial mobility. However, students and graduates do not always stay in their chosen field or firm (on transitions, see Krone et al. 2019).

Thus, dual study programmes manifest ways in which employer interests and investments are (re)shaping advanced skill formation. They produce new, higher level skills at the nexus of higher education and workplace-based training. We argue that such contemporary developments in Germany provide an innovative approach to simultaneously articulate and, ultimately, strengthen the links between (postsecondary) education and the economy. Co-developed and co-financed by employers, these programmes have many advantages. Benefits include encouraging employers to fund their own skill supply, at least partially. This could help to moderate the global trend towards saddling students with ever-higher education costs and student debt, a particularly grave concern in the UK and the USA, but also in other increasingly marketized higher education systems such as Australia.

Grounded in neo-institutional analysis, expert interviews, and document analysis, our analysis focuses on the relationship between higher education and firms in Germany, Europe's largest higher education system and economy. First, we introduce the historical-institutional context of advanced skill formation in Germany. Then, we analyse the genesis and rapid expansion of dual study programmes. In particular, we emphasize the role of employer interests and highlight distributional conflicts in the new politics of skill investment. Finally, in an era in which university-industry partnerships are becoming increasingly relevant, we present lessons other countries might glean from a newer form of work-based higher education.

## THE GERMAN SYSTEM OF ADVANCED SKILL FORMATION AT THE NEXUS OF HIGHER EDUCATION, SCIENCE, AND INDUSTRY

Germany is the birthplace of the modern research university (Baker 2014). Its universities continue to be a reference point for other countries across disciplines and industries, as they function as the backbone of the third largest producer of scientific outputs worldwide. Whether in scientific advances (measured in research articles) or practical applications (measured in patents), Germany has enjoyed phases of pre-eminence, completely losing and then regaining its strengths in both theoretical and applied fields over the twentieth century (see Dusdal et al. 2020). University-industry cooperation, a driver of innovation across sectors and between public and private organizations, continues to rise in importance, especially because it facilitates knowledge transfer and the production of new technologies (see Mascarenhas et al. 2018 for a review of university-industry cooperation).

In contrast to heavily market-oriented systems like the USA, higher education in Germany is considered a public good. Within this context, and due to student protests against regionally variant implementation of tuition fees (Hüther and Krücken 2014), nearly tuition-free higher education is provided, regardless of nationality.<sup>1</sup> State provision of university-based education is taken for granted, although the private sector in postsecondary education has grown rapidly recently, extending the influence of markets on postsecondary studies even in one of the most state-oriented (and nearly wholly state funded) of all higher education systems.

Simultaneously, Germany's traditional secondary-level apprenticeship system, which links workplace training with vocational schooling in particular occupations, also continues to be attractive globally (Powell and Solga 2010; Euler 2013) and within Germany. This is despite the fact that it is challenged by 'academization' and the increasing attractiveness of higher education for more than half of each cohort.<sup>2</sup> Dual apprenticeship training at the upper-secondary level has a celebrated history in Germany, firmly embedded in corporatist governance structures that involve employer and employee representatives from business associations and unions as so-called social partners (Busemeyer and Trampusch 2012). These programmes lead to recognized certification according to the *Vocational Training Act* or the *Crafts Code* and thus govern access to specific occupations (Thelen 2004).

Both higher education and vocational training in Germany have in the past provided policy inspiration for other countries, such as in England over two centuries (Phillips 2011). Many countries worldwide have long been interested in learning from German models of practice-oriented training (Ertl 2014), an interest now extending to dual studies (Graf et al. 2014). However, currently, the German skill formation system is undergoing reforms to address issues of institutional permeability between the organizational fields of higher education and vocational training. Indeed, these fields' strengths, each defined by distinct rules, norms, and practices, led to a persistent divide between them, known as the 'educational schism' (*Bildungsschisma*) (Baethge and Wolter 2015). This is visible also in the larger divides between the church, state, and market and long-term secularization (Gordt 2019). This division, while strengthening both fields in their distinctiveness and providing a 'safety net' in terms of access to gainful employment for graduates from vocational training (Shavit and Müller 2000), has long hindered educational (and social) mobility. Today, this presents a problem, not least due to socio-political developments like the growth of the knowledge economy and rising educational expectations that risk lowering the status of vocational education and increase the demand for academic education (Powell and Solga 2010). In this context, dual study programmes, operating at the higher education level, can provide answers through higher level skill formation and promise to facilitate needed flexibility in educational careers and lifelong learning for all. This is relevant especially for young persons from disadvantaged socio-economic backgrounds who have managed to acquire a higher education entrance qualification but may refrain from more traditional forms of (unpaid) higher education given lack of funding. Yet, how could these hybrid programmes arise at the nexus of vocational training and higher education in a context in which these two fields are traditionally divided?

## THE ORIGINS OF WORK-BASED HIGHER EDUCATION IN GERMANY

With the rise of dual study programmes, an 'extension' of the dual principle to the higher education sector took place. The concept of dual training at the higher education level originated from the so-called vocational academies. In 1972, on the initiative of large industrial firms, such as Bosch, Daimler-Benz, and Standard Elektrik Lorenz (Kramer 1981), the

Wuerttemberg Academy of Administration and Business (VWA) and the Chamber of Industry and Commerce of the Stuttgart region cooperated to create the first vocational academies, the prototype for dual study programmes (Beschoner 2009). This so-called *Stuttgarter Modell* aimed to help these firms recruit talented young people who had general academic skills and held a university entrance diploma (*Abitur*) into vocationally specific training. Given the growing demand for academically qualified workers with experience of, and a strong affinity for, actual work practice, a key motive of these large firms was to recruit qualified personnel who were more attuned to, and aware of, the firm's specific skills demands than regular higher education graduates (Mucke and Schwiedrzik 2000). In addition, dual study programmes minimized the time new employees needed to familiarize themselves with the job as well as with the organizational culture.

Initially, vocational academies were not taken seriously by most of the established actors in the vocational training and higher education fields (Graf 2018). This is because vocational academies were placed in a niche or grey area between the established but institutionally separated fields of vocational training and higher education. Indeed, in some German *Länder*, vocational academies are categorized as part of the higher education sector, and in others, they are part of the higher vocational training sector. The vocational academies also have a unique status regarding their representation at the national level, as they are neither part of the German Rectors' Conference (HRK), nor do they fall under the remit of the Federal Institute for Vocational Education and Training (BIBB). This location in an institutional grey area, which actually offered far more room for flexible interpretation of dual forms of training, is crucial. It implies that neither the standardization procedures of the collectively governed dualist vocational training sector nor those in the higher education sector directly applied to these newly created programmes. The discovery of this grey area allowed employers to initiate this new type of work-based training in cooperation with willing partners from education. At the same time, it should be noted that this evolution in a grey area also implies significant variation in the way dual study programmes are implemented in the 16 German states and, in turn, a certain lack of standardization and quality assurance at the national level (Deißinger 2000; Graf 2018).

Another indicator of their unique status and location in an institutional grey area is the absence of vocational academies from any general education policy plan (Kahlert 2006). They were first created by firms

defensively, at a time when the newly established universities of applied science (so-called *Fachhochschulen*, now simply *Hochschulen*) threatened firms' ability to recruit promising young people. Between 1969 and 1972, the first universities of applied science were established through a politically planned upgrading of technical and engineering schools to meet increased demand for tertiary education and improve the international reputation of this type of training (BMBF 2004). However, influential large firms in Baden-Wuerttemberg responded by launching the first dual study programmes to secure their hold on high-end vocational training. These firms feared increasing academization (Schwiedrzik 2001) and a loss of influence due to the greater institutional autonomy of the new universities of applied science (Kahlert 2006). In addition, in the aftermath of the mass student protests of 1968, these firms were sceptical of the capacity of these new universities of applied science to produce 'loyal employees' (Hillmert and Kröhnert 2003). In this context, large firms actively sought new options that would allow them to (a) recruit talented young people for their work-based training programmes and (b) ensure that these programmes would generate the needed skills. Thus, large firms acted as institutional entrepreneurs in pushing for greater differentiation in the established skill formation system.

However, large firms did not have sufficient influence within higher education in Germany—typically dominated by 'political legalism' (Goldschmidt 1991), the 'academic oligarchy' (Clark 1983), and the *Bildungsbürgertum* (middle-class intellectuals)—to directly influence the upgrading of the engineering and technical schools into universities of applied science. And the traditional dual apprenticeship system, with its strongly institutionalized collective governance system, also did not provide the level of leeway the firms needed to make more radical changes in response to broader academization. Thus, these firms opted to establish a new organizational form that specifically catered to their needs and integrated institutional elements from traditional dual apprenticeship training with those of higher education. They neither sought to entirely displace the newly established universities of applied science nor the traditional dual vocational training programmes but instead established a new organizational form in a grey area between these two established ones (Graf 2018). In grafting dual study programmes—by way of a bottom-up layering process—on top of traditional dual apprenticeship training, the firms managed to evade the veto power of both trade unions and smaller firms,



whose influence in the policy field of education is firmly grounded in the traditional apprenticeship system alone.

In fact, the German Trade Union Confederation (DGB) was very critical of the launch of dual study programmes, which it described as a short-term, narrow-gauge mono-education (Walitzek-Schmidtke 2014). Smaller firms also opposed the reform of this traditional system, albeit for different reasons. While trade unions are typically largely in favour of increasing the academic content of apprenticeship training, they feared that more differentiation and flexibilization of the system would lead to a greater dominance of firm-specific instead of industry-specific skills. This would increase the dependence of apprentices and workers on specific employers, thus reducing the power of labour associations. In contrast, the main issue for smaller firms is that they do not need high-level academic skills as much as larger firms do. Large firms, especially export-oriented ones, often experience greater demands to upgrade their workers' skills—and they usually have greater financial leverage to do so. Yet, smaller firms' interest in maintaining the traditional model tends to be rather the result of the wage compression that comes with national collective bargaining and certification. This allows them to recruit relatively well-qualified apprentices at reasonably low cost. Indeed, smaller firms' involvement in apprenticeship training often depends on the productivity or added value of apprentices during the training phase. Hence, as an increase in academic skills means less time spent in the workplace, this would reduce the economic viability of apprenticeship training for smaller firms.

As indicated earlier, large firms' initial move to create vocational academies can be characterized as a defensive response to increasing academization and especially the rising numbers of young people entering academic secondary schooling. This was partly enabled by social democrats as key proponents of making selective academic secondary schools more accessible to the lower middle classes (Nikolai and Rothe 2013). However, these firms subsequently realized that they had created a new institution upon which the trade unions and smaller firms did not have direct governance claims. It is in this regard that dual study programmes differ from the more traditional sequential vocational training-higher education model. Within this model, ambitious, academically motivated individuals first complete dual apprenticeship training and later move on to study at a university of applied science (e.g. in engineering). In this sequential model, the overall training period is longer and, more importantly, the two

sequences are firmly embedded within the governance mode of either vocational training or higher education. For example, trade unions and works councils are well positioned to organize apprentices and workers below the level of higher education trained engineers (Herrigel 2015) and, therefore, trade unions are still somewhat connected to engineers coming out of the sequential model. Yet, this is no longer true for most higher education graduates of dual study programmes. Additionally, from the firms' perspective, dual study programmes decrease the risk that candidates hired for an apprenticeship programme at the upper-secondary level will later decide to acquire a higher education qualification and quickly leave the firm.

In sum, this historical analysis shows that the genesis of dual study programmes is characterized by the reform initiative of large employers, with small firms and unions playing a rather marginal role. While the vocational academy can be seen as the birthplace of dual study programmes, such programmes were later adopted by universities of applied sciences and even research universities (referred to collectively as universities in this chapter) as the starting point of an impressive expansion phase. In 2016, the number of students in dual study programmes broke the 100,000 benchmark (BIBB, 2018: 196), implying that in certain subject areas, dual study programmes already represent a sizeable proportion of the relevant student groups. While dual programmes have existed since the 1970s, they have grown very rapidly, especially over the past decade (Krone et al. 2019: 13).

### DUAL STUDY PROGRAMMES: A NEW PILLAR OF GERMANY'S MODEL OF WORK-BASED SKILL FORMATION

Dual study programmes were initially launched by German employers, especially in manufacturing, to ensure the practical relevance of the academic skills higher education graduates acquire. Responding to this challenge, in the 1970s employers began to cooperate with various types of educational organizations to build dual work-based academic programmes at a higher level. By uniting firm-based training with postsecondary academic education in applied courses of study, these new 'hybrid' programmes facilitate making the most of technological change and academic upgrading of curricula.

Over the past decade, this unique feature of Germany's higher education system has expanded markedly (BIBB 2015; Ertl 2020). In joining elements of apprenticeship training and higher education, this specific type of work-based higher education accomplishes institutional boundary spanning, especially with regard to curricula, teaching staff, and funding. Such connections between the learning environments of the firm and the academy extend far beyond the summer internship or abbreviated on-the-job training common in the USA. When teachers in academic organizations and employers work together in systematic ways to design curricula, they ensure that students have learning opportunities guided not only by academic faculty but also by company experts. Employers cover the costs of training during the praxis term, paying students for their work and studies, thus reducing the financial burden on families. Dual studies provide a sought-after pathway for young adults to learn and earn simultaneously. Crucially, this enables young adults to jump-start their careers. For employers, such programmes attract, mature, and maintain valuable talent.

The core principle of such programmes is their interactive combination of the workplace and the seminar room. These two distinct learning environments offer necessary but distinct opportunities to gain practical and academic knowledge. Dual study programmes are most common in economics, engineering, and computer science, but are also growing in other disciplines, such as health-related fields (Graf et al. 2014). Thus far, subjects have been concentrated in areas close to growing economic sectors. Students apply directly to the firm, which in turn collaborates with the university to provide academic education. All involved parties (the student, the firm, and the university) are bound by a formal agreement and students continue with that same firm for their entire undergraduate study period. The firm is responsible for financing the in-firm training. It also pays the student a salary, typically equivalent to, or higher than, that for traditional apprentices in the respective industry. A large portion of the costs for the programme's academic part is state-financed, as most dual study programmes are offered through public universities (of applied sciences). However, where firms cooperate with a private university, they usually cover much or all of the incurred costs.

Dual study programmes usually lead to a bachelor's degree in about three to four years (dual studies at master's level are still rare but also expanding) and connect two didactic principles, namely, scientific grounding and practical training. The original type of dual study programme integrates an initial vocational training certificate (otherwise acquired when

graduating from vocational training at the upper-secondary level). Here, graduates attain double qualifications—an upper-secondary-level vocational training certificate and a bachelor's degree from the university—thus improving access to specific occupations.

Notably, the impressive recent expansion of such work-based higher education programmes in Germany is due more to employer initiative than to government action or party politics. While in Germany, state (*Länder*) governments and also the federal government are the decisive players in regulating and financing higher education, this is only partly true for dual study programmes. Rather, collaboration between employers and universities is crucial, with these programmes developed bottom-up, as discussed earlier. This is indicative of an innovative development in German higher education that resonates with certain developments in the USA. What has long been acknowledged and valorised in the USA, namely, that higher education institutions are strong organizational actors in their own right, is increasingly evident in Germany as differentiation proceeds and universities develop more specific profiles.

This emergent field of work-based higher education exhibits similar cleavages and coordination challenges that exist in the traditional dual training system. Key arenas of contention include the provision of training, its financing, as well as the related mechanism of control and public oversight (see Busemeyer and Trampusch 2012 on dual training at the secondary level) but also the conflictual politics of general versus specific skills more broadly (Streck 2012). In the traditional German dual vocational training system (at upper-secondary level), a balance between the various interests of the involved stakeholders (capital, labour, and the state) is feasible due to the tradition of practiced corporatism. In contrast, in the field of higher education, we encounter a largely unexplored terrain of negotiations and, crucially, decentralized cooperation (Culpepper 2003; Emmenegger et al. 2019) around work-based training programmes developed by higher education institutions and firms, more or less collaboratively.

However, to date, research in the tradition of the political economy of skills has mainly focused on the study of the traditional dual training system at the secondary level as one of the hallmarks of corporatism in German capitalism (Hall and Soskice 2001). Thus, given recent developments, the political economy approach to skills requires adaptation to account for more recent developments in higher education (Hölscher 2012). When political economists analyse skill formation, they tend to be

especially interested in the role of firms (or employer associations) and trade unions in the vocational training system. Yet, as the dual principle is upgraded to the tertiary level, employers take centre stage in negotiating new governance forms of higher education. Consequently, we observe changing constellations and coalitions of actor groups within higher education. We argue that the interactions of these groups, including employers and universities and their associations, among others, provide fruitful ground for future analyses of advanced skill formation.

### THE POLITICS OF WORK-BASED HIGHER EDUCATION IN GERMANY

The governance of dual study programmes represents shifting lines of conflict in advanced skill formation. Crucially, through the bottom-up development of such schemes, two actors have gained influence relative to the others. Employers as original drivers behind dual study programmes and universities as entrepreneurial actors in their own right. In contrast, the actor that seems to be left behind is the unions, traditionally a key partner in German skill formation. While German unions concentrate on the governance of traditional dual apprenticeship training, their attention on developments in higher education has been limited, as they struggle to win tertiary graduates as a new main source of members. Thus, in an era of structural changes in the economy and rising educational expectations, unions have had difficulty in realizing opportunities in advanced workplace-based training. This is even more relevant given that a lack of union involvement could result in such programmes focusing too narrowly on firm-specific skills.

Furthermore, current institutional innovations could well undermine traditional high-level dual apprenticeships at secondary level, as these are gradually shifted to higher education. However, lower skill apprenticeships are not being similarly upgraded. Thus, dual study programmes are unlikely to close the gap between high- and low-skill sectors but rather academize the medium sector of traditional apprenticeships, for example, in industry and commerce occupations. The losers might be those who previously would have gained access to traditional medium-skill occupational training but are now potentially left behind as academization accelerates. While dual study programmes were thought of initially as potential equalizers, now it is generally the top secondary school graduates who are

selected into them. Nevertheless, especially from a trade union perspective, dual studies in principle *could* offer opportunities to successfully complete higher education for those without sufficient capital to invest. This participation would provide access to attractive career pathways. More generally, dual study programmes tackle issues stemming from limited market absorption at the nexus of vocational training and higher education. When successfully implemented, they embed employers' knowledge about current and future skills demands into advanced skill formation.

### THE POTENTIAL OF DUAL STUDY PROGRAMMES AT THE NEXUS OF HIGHER EDUCATION AND EMPLOYMENT

Dual study programmes are quickly becoming a key element in the German higher education system (Ertl 2020). This development is more likely to be successful if these programmes invest equally in the provision of high-level academic skills and hands-on practical skills. Employers increasingly demand this combination in recruiting talented young people for high-level training programmes. More broadly, the combination and feedback processes between educational organizations and firms promise innovation at the nexus of education and economy. This, in turn, opens up new perspectives for the comparison of advanced skill formation.

In an era of growing constraints on public funding in many countries, such programmes facilitate needed private investments in higher education. This development relates to the blurring of traditional boundaries between higher education and vocational education and training in many countries around the world (Powell and Solga 2010), also reflected in a gradual convergence of these fields across Europe (e.g. in France and Germany) (Powell et al. 2012). In the USA as well, some work-based higher education programmes resemble the German dual study programmes: higher-end apprenticeship programmes offered by American community colleges as well as a vast range of cooperative study programmes (Graf 2017). However, these USA variants often do not successfully or sufficiently combine workplace and academic learning.

In this context, a key lesson that can be learned from the German case is the need to build structures that allow higher education organizations and employers to cooperate and overcome potential conflicts between the worlds of academia and work. Compared to traditional vocational training, universities are more alike in Germany and the USA. Thus, universities' relations with firms can be relatively similar in the two countries,

especially with increased privatization and the growing need for private investments in education. However, what is crucial is inter-employer coordination. This can be facilitated by local and national intermediary organizations, such as business associations or chambers, that facilitate the joint development of such programmes and prevent free-rider problems related to poaching. In such settings, firms understand that they have to pay (more) for the advanced skills they require.<sup>3</sup> This may involve greater private costs in training programmes and student salaries. It also implies investments in academic skills that may well transcend immediate firm-specific skills. Concurrently, the academy faces the challenge to develop tools that ensure systematically integrated work- and theory-based learning experiences. For this, university representatives must leave the ivory tower to negotiate and develop with employers eye-to-eye.

As a recent development, the insertion of the dual principle of vocational training that alternates phases of theory and practice into German higher education, as evidenced by the dual study programmes, provides both opportunities and risks. At the intersection of higher education and vocational education, such programmes imply increasing corporate influence in higher education. Simultaneously, expanding work-based higher education programmes may stimulate innovation. The closer link of higher education to the economy may facilitate advanced practice-oriented skill formation while spurring educational and social mobility within, and beyond, higher education. Thus, if policymakers set the right incentives for decentralized cooperation between public and private actors and discourage detrimental dynamics that threaten the collective spirit of work-based skill formation, this type of dual higher education may lead firms to invest more heavily in high-quality tertiary-level education programmes, as well as salaries for student employees. Finally, a key principle of such a system is that employers and the state *jointly* cover the costs of work-based higher education. The costs would be balanced by benefits such as integrated curricula, enhanced firm competitiveness, and better skill matching.

Another strength of dual study programmes is the high degree of curricular integration between the two learning environments of the university and the firm. Yet this ideal tends to be quite challenging to implement on the ground. In Germany, it partly derives from a long-standing tradition of collective governance in the field of work-based training through key stakeholders such as educational organizations, employers, trade unions, and state agencies. Dual study programmes that integrate a formal vocational training certificate and a bachelor's degree exemplify this crucial collaboration. In these programmes, the chambers of commerce are

involved, for example, in examining candidates for vocational training certification. To foster the cooperation of all involved actors and enhance necessary fine-tuning between the learning experiences in universities and the workplace, it seems worthwhile to explore how cooperative study programmes in the USA could offer a double qualification: a bachelor's degree and a registered apprenticeship certificate. An additional advantage is that if students realize that achieving a bachelor's degree is too demanding for them, they still have the option of earning a registered apprenticeship certificate. Where this reduces higher education dropout rates, it would save the loss of human capital and help individuals qualify for entry into (skilled) labour markets.

Another potential advantage of apprenticeship training being offered in conjunction with higher education is that this would boost the reputation of apprenticeships overall. Connections between vocational and academic educations within organizations provide a type of permeability essential to address persistent inequalities in higher education participation (Bernhard 2019). The German experience indicates that the attractiveness of the apprenticeship training system, as a whole, can be bolstered when it offers a viable pathway for those individuals with a traditional university entrance certificate. If these students seriously consider and choose advanced work-based higher education, this may well increase the standing of apprenticeship training among students, their families, and employers. Thus, dual study programmes provide an innovative model for policymaking and implementation. Dual study programmes excel when considering strategies to improve skill formation overall, to reduce the costs individuals must bear in attaining higher education, and to improve the fit between the expectations of employers and potential employees regarding skill formation programme. The origins and contemporary developments in work-based higher education in Germany thus can offer lessons and inspiration for Anglophone countries, with their strong and differentiated higher education systems, to further bolster study programmes coordinated with firms.

## NOTES

1. In Baden-Württemberg, foreign students from outside of the European Union pay €1500 per semester (MWK 2020).
2. This refers to the comparison of the number of new entrants into higher education and the number of entrants into vocational education and training (BIBB 2018: 89; Dionisius and Illiger 2015: 45).



3. Crucially, a lack of such willingness to invest on the part of firms represents a serious obstacle to the transfer of dual study programmes to other countries (Graf et al. 2014: 117). In fact, in many countries, employer investment in training has been declining (e.g. Oliver and Wright 2016 on Australia). In such contexts, a training levy may provide a viable remedy. However, for such a levy to work well, it needs to be implemented systematically, taking into account relevant contextual factors (e.g. Richmond 2020 on the UK).

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ISSN 2524-6313

ISSN 2524-6321 (electronic)

Palgrave Studies in Adult Education and Lifelong Learning

ISBN 978-3-030-84501-8

ISBN 978-3-030-84502-5 (eBook)

<https://doi.org/10.1007/978-3-030-84502-5>

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