



INTEGRATING ENTREPRENEURSHIP AND WORK EXPERIENCE INTO HIGHER EDUCATION

Literature Review GERMANY 

Documented created by André Perusso
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1. INTRODUCTION

Like in other European countries, the German labour market has also changed dramatically in the past 20 years. The globalization of the economy, together with the shift from a manufacturing-based to an information-based society lead educator, companies and students to re-evaluate the role of higher education institutions. Concerns with employability and the capacity to adapt to an ever-changing market generated an increasing pressure for HEIs to provide a different form of preparation for students who are entering this challenging scenario. Among the many adaptations needed, the provision of more and better work experience, together with a closer relationship between HE and the world of work is among them.

In the particular case of Germany, this concern has been addressed relatively earlier than in most EU countries. Germany carries a long tradition of using the workplace as an environment for learning since the development of the first vocational training schools in the 60's and later, in higher education, through their renowned dual study programs. Those types of programs are relatively unique to the German-speaking world, and are characterized by interchangeable periods of in-company practice and theoretical training at HEIs. Consequently, even though not adopting the exact same terminology, one can say that the idea of a work-based learning is not new in Germany and is relatively well diffused.

In addition to dual study programs, Germany also embraced internships as a form of provision of work experience. Referred as 'praktikum'; it offers students the opportunity to work for a company in the last semesters of their study programs, with the purpose of gain work experience and increase employability. Similar is the role of traineeships. Although originated outside of Germany, German multinational corporations have rapidly embraced the idea of preparing graduates for future leadership position through a system of job rotation and specific training. Last but not least, entrepreneurial education is also gaining momentum, with large cities such as Berlin and Munich offering centres of expertise to develop entrepreneurial mindsets.

In respect to disciplinary areas, a relative 'schism' in regard to theory and practice integration can be observed among research-based universities, universities of applied sciences and the professional schools. As the third and second have embraced a more practice-oriented education, the first remained attached to the traditional values of the classic university and the idea of a holistic academic education, characterized by the 'Humboldtian' model. Consequently, study fields where the research-university model is dominant, such as the pure-hard and pure-soft sciences also have the weakest connection with the world of work.

Such topics, as well as greater details over each mode of WBL delivery, disciplinary areas, current context and drivers and barriers will be further illustrated in this work.

2. WBL UNDERSTANDING

The term 'work-based learning' (WBL) is not specially diffused in Germany. Unless you talk with an expert, the association generally made with 'using the workplace as a vehicle for learning' is still highly connected with the idea of vocational training systems (VET). In the particular case of higher education, the term is associated either with mandatory internships students must complete in order to graduate, known in Germany as 'Praktikum', or the renowned German model of dual study programs, as the next paragraphs will detail.

WBL and VET – two close friends

The understanding of the term WBL in Germany is strongly shaped by the Germany renowned vocational education and training (VET) system. Therefore, to understand WBL in Germany, one needs to first acknowledge the influence VET systems have in the development of the workplace as a vehicle for learning.

Germany has a long-standing tradition of integrating study and the workplace, manifested in the form of its renowned dual apprenticeship systems at upper secondary level (Graf, 2015). This particular model of VET combines in-company training with part-time classroom instruction provided by vocational schools (*Berufsschulen*), leading to nationally-recognized professional certificates. What distinguishes the German dual apprenticeship training from other forms of vocational training systems available in most European countries is the strong coordination between the state, employers, and labour representatives (Busemeyer and Trampusch, 2012).

Nevertheless, the same level of integration among classroom instruction and work experience is not seen in the German HE system. As in most countries in Europe, German higher education, especially in research-based universities, is marked by a highly theoretical content delivered in the form of traditional classroom lectures which strongly oppose to the work-integrated system adopted by dual apprenticeship model. This distinction among VET and HE delivery has been referred as the 'educational schism'. Reasons for this division can be traced back to the national model of capitalism implemented in Germany as well as the segmentalist strategies of middle-class intellectuals (Baethge, 2006 cited in Graf, 2015).

However, earlier than most countries in Europe, Germans understood that with the rise of the knowledge age and the consequent changes in workplace dynamics, this segregation between VET and HE systems has become increasingly contested (Hippach-Schneider et al., 2013). With companies expecting from graduates and HEIs a formation which is not only theoretical, but takes into account the development of general competences, summed with an increasing concern with

employability (Baaken, et al. 2015), German HEIs have been forced to consider modes of delivery more in line with the VET system. With that in mind, the major way German HEIs have addressed this issue is through the development of what is called 'dual study programs' (*duale Studiengänge*). In line with the understanding of WBL proposed by this project, such programs combine in-company work experience with scientific orientation delivered mainly through vocational academies (*Berufsakademien*), cooperative universities (*Duale Hochschulen*) and universities of applied sciences. Another characteristic of the German dual study programs which resemble our WBL definition is that work and study phases are integrated in the form of a coordinated curriculum (Graf, 2015). Due to this characteristics, in Germany the term WBL is strongly associated with this type of study programs.

WBL and the 'Praktikum'

In addition to the dual study programs, the term WBL is also commonly associated with the idea of internships, or in German '*praktikum*'. Different from the dual study programs, internships offer students contact with practice under the framework of a fixed-term assignment, which can last from a few weeks to one or two semesters, but is not necessarily embedded in the curriculum, although there are a number of HE programs where internships are mandatory. Nonetheless, even considering these differences, elements of the German dual apprenticeship model still influence the understanding and design of internships. According to Cleuvers (2015), different from other EU countries, in Germany internships' main purpose is to ease the transition from school into vocational education, or from higher education to the professional market and are aimed, not only to university students, but also widely adopted at higher secondary school level (Schülerpraktikum and Berufsorientierungsprogramm) and even as an instrument for the repositioning and re-integration of unemployed workers considered 'difficult to employ' (Einstiegsqualifizierung). The rationale for such programs is, therefore, not only acquire skill and practical experience on a certain disciplinary field or profession, but also to gain insight into professional life and its requirements, check whether a professional field is of interest, and if the student's competences match the requirements of one specific profession or area of study.

Under the same terminology (*praktikum*) one can also find what WEXHE classified as traineeship. In Germany, the distinction between the internship, in the sense of being conducted during studies, and trainee, who is aimed for graduates, is not always clear. For instance, statistic reports from federal and state agencies, such as the BIBB (Federal Institute for Vocational Education and Training) do not make a clear distinction from both types of *praktikum*. They classify them simply as internships during studies and after studies. Nevertheless, in recent years, the effects of globalization and homogenization of recruiting practices, especially from multinational corporations, have made the traineeship - in the WEXHE refers to - increasingly popular in

Germany. And even more recently, SMEs are also adopted this mode of recruiting (Hädicke, 2017).

3. WBL TYPOLOGY

As mentioned early, the term WBL in Germany is highly associated to the idea of VET and internships (praktikum), therefore the most elaborate typology is found in those two modes of delivery. Nevertheless, although not academically accepted, some form of classification can also be found in traineeships and entrepreneurships as the next paragraphs will describe.

Dual study programs and internships

Considering this dual understanding of the term WBL, first as fixed-term assignments in-company (praktikum) and second as the more elaborate dual study programs; WBL typology in Germany is also heavily associated with these two connotations of the term (Dietrich, 2017). Regarding the dual study programs, they are characterized by a high degree of flexibility, which leads to a great variety of delivery modes exist (Waldhausen and Werner, 2005). Yet, a few characteristics can be seen in all modes of delivery: a) a curricular-level integration of work and theoretical training, b) a degree of coordination between the HEI, the partner firm and students and c) a formal work contract established between student and the firm.

In the 90s, the Higher Education Information System (HIS) established the first taxonomy of dual programs delivery modes, which was refined in 2010 by the BIBB, the Federal Institute for Vocational Education and Training (Kupfer and Mucke, 2010). BIBB taxonomy is described below:

- *Dual study programs integrating an initial VET certificate (ausbildungintegrierende duale Studiengänge)*: the distinguishing characteristic of this type of dual programs is that, at the end of the program, students are awarded with combination of two qualifications which are not normally associated with one another; a VET certificate, registered by the Chamber of Commerce (IHK) or Chamber of Crafts (HWK), and a university-level degree from a university or university of applied sciences. These programs last for three to four years and students have to sign a training contract with a firm. Similar to VET training, theoretical and work-based learning are integrated in different ways, either by intercalating work phases and training phases within the week, or *en-bloc* with 8 to 16-week intervals.
- *Dual study programs integrating work practice (praxisintegrierende duale Studiengänge)*: similar to the previous, in the Dual study programs integrating work practice students also establish a contract with a firm, studies last from 3 to 4 years, and the work-based learning is embedded in the curriculum. The difference however is that,

at the end of the program, students do not receive a VET certificate; 'only' the university-level degree. The fact that students are not entitled to a VET qualification gives more freedom for HEIs and companies to establish different types of work contracts and allows for more flexibility regarding the allocation of work and theoretical training (Graf, 2015).

- *Dual study programs integrating an occupation (berufsintegrierende duale Studiengänge)*: These programs are oriented to people who have already completed VET training and have the intention to acquire a university-level degree without needing to leave their current jobs. The programs also last three to four years and the curriculum needs to be closely associated with the student work experience (Graf, 2015). Furthermore, the VET qualification often reduces the study hours needed to complete the bachelor program.
- *Dual study programs accompanying an occupation (berufsbegleitende duale Studiengänge)*: such dual programs are also designed for those who have full-time occupations but want to acquire university-level education. Yet the difference from the dual study programs integrating an occupation is that here students attend to lectures through distance-learning, studying on their free time. However, different from the more traditional distance-learning programs, here the employer is aware and assists the students in completing the program. Such support might include, for instance, adapting the employee's function to match some specific learning goals, or allow students to miss work days to prepare for exams or attend *in locus* seminar sections at the HEI.

In respect to internships, a variety of delivery modes also exist, yet taxonomy has divided internships into three main categories:

- *Voluntary vs. Obligatory*: Generally speaking, obligatory internships are an integrating part of a higher education program curriculum. Although mostly incorporated as a practical semester at the end of the program, internships can be foreseen either as a pre-study practical or an internship non-term (Cleuvers, 2015). Voluntary internships, as the name says, are individual activities performed by students seeking to gain experience in practical training. Therefore, the distinction between voluntary and obligatory placements is closely connected to whether the leading actor behind the internship arrangement is an individual (voluntary) or an organization (mandatory); which in the case of HE is the university.
- *Grade of intensity*: Internships can also be classified according to the grade of intensity, ranging from what is called 'practical tests', lasting for one day only with the purpose of getting to know the activities of a business or organization, passing through workshops, which last for a few days, to finally 'in-depth' internships, served over several weeks, whole semester or even a full year. The 'grade of intensity' is particularly

relevant to determine work conditions, status,, right and duties of interns, as will be detailed in section 4.

- *Actors and stakeholders:* another categorization commonly adopted to distinguish internships refers to who are the stakeholders promoting the activities. In Germany, employment agencies such as the Federal Employment Agency or chambers of industry and commerce are often promoting internships with the main purpose of promote employment. Naturally, HEI and companies are also important actors. HEIs are seeking to offer students contact with practice and career placement and business are searching for qualified future employees.

Traineeships

This study could not identify any specific academically defined typology for traineeships. This lack of taxonomy is probably associated to the fact that traineeship programs are highly customized to attend company-specific needs and demands. Yet, there are some key characteristics that distinguish the different trainee programs (Friedenberger, 2016) which can be arguably used as a form of typology. Those include:

- *Job rotation:* the job rotation is the most defining characteristic of a trainee program and is one of the features that most attract candidates.
- *Duration:* some programs last for one year, some for two, but the most common duration for trainee programs in Germany is 17 months.
- *End contract:* some trainee programs guarantee a permanent contract for the participants at the end of the process and some leave this possibility open.
- *Payment:* different from internships, the trainees are employees of the company and must be paid according to the German labour law regulations.
- *International opportunities:* an increasing number of trainee programs offer participants the opportunity to make one or more job rotations abroad.
- *Courses and special training:* an large number of programs offer, on top of the normal work projects trainees must complete, additional training in specific skills of features, which can be more technical ones (IT related for instance) or on soft skills.

Entrepreneurship

The link between entrepreneurship and HE in Germany happens typically at three levels: a) as a preparation course for future entrepreneurs; b) through the use of entrepreneurial problems as a vehicle for learning and c) for technology transfer (Kliewe, 2017). Although this is not an official typology, most practical cases fit into one of these three categories, which are described in greater detail bellow:

- *A) Preparation of future entrepreneurs:* often delivered in the form of entrepreneurial programs or workshops aimed to those who want to become entrepreneurs or who already are but feel the need to sharpen their skills to enhance success chances. The objective is to train those persons in entrepreneurship skills and knowledge aimed to open and run a business, or develops their own business ideas. Although not very popular, such programs are becoming trendier in Germany, where a few centre of excellence already exists, such as the UnternehmerTUM in Munich, the Strascheg Center for Entrepreneurship (SCE), also in Munich, and the Centre for Entrepreneurship from the Technical University Berlin.
- *B) Use of entrepreneurial problems as a vehicle for learning:* universities, especially business schools, use entrepreneurial problems to teach specific skills/processes. For instance, entrepreneurship problems such as market research or prototype development are transformed into an activity where the purpose is not necessarily to form future entrepreneurs, but teach specific disciplinary knowledge or transversal skills that can later be used in a variety of professional activities. Examples of such activities include market research projects, business plan development, prototype development, product development, financial planning and valuation, etc...
- *C) Technology transfer:* perhaps the most common association entrepreneurship has with HEIs; technology transfer encompasses the transfer of research output into marketable products/services by university professors, PhD students or other researchers. Technology transfer activities often are supported through specific institution or departments within the universities, who helps to launch ideas and/or establish contacts with the market. Sometimes those 'tech transfers liaisons' offer simply contacts. Yet in other cases, they also offer a more elaborate structure, which is normally referred as incubators. Both modes are relatively common in German universities, especially universities of applied sciences.

In addition to those three more typical connotations, the concept of entrepreneurial universities can also be found in Germany. A still a nascent idea, entrepreneurial universities adopts the entrepreneurial spirit at multidisciplinary level. Meaning there is a strategic alignment within all departments to orient efforts towards entrepreneurial activities and a closer connection with businesses. This affects not only research output, but also teaching and multi-departmental collaboration. An example of such institution is the Technical University Munich (Kliewe, 2017).

4. WBL CONTEXT

Because the understanding of WBL in higher education in Germany is, more than anything, entangled with the dual study programs and VET systems, its context has been strongly shaped by the principles of the dual education, with consequences affecting also other forms of delivery such

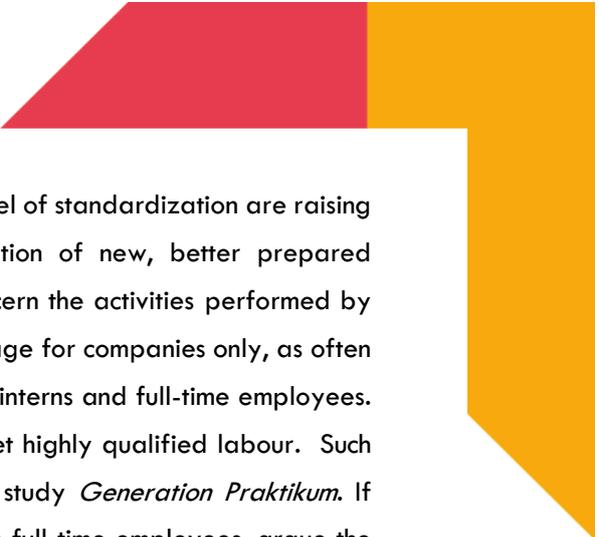
as internships and traineeship. Therefore, to better understand the current WBL context in Germany it is critical to get familiar with the origins of the dual system.

Dual studies and internships

The genesis of the dual study programs dates back to 1972, when the Württembergische Verwaltung und Wirtschafts-Akademie (VWA) and the IHK Stuttgart cooperated with large companies such as Bosch and Daimler Benz to create the first vocational academies and, with that, the prototype of dual study programs (Graf, 2015). Not by chance, this period coincides with the establishment of the first universities of applied sciences, which were designed, in great part, to give academic credibility to the already existing engineering technical schools. In this context, large corporations feared that they would lose access to skilled VET-trained engineers to the newly created universities of applied sciences. Therefore, in reaction, these companies incentivized the creation of dual study programs (Graf, 2015).

This 'bottom-up' structure persists today, as dual study programs are normally established by the firm's initiative in connection with a local university. There is, therefore, a high degree of flexibility in the specific forms such programs adopt, with the curriculum, the status of students in the workplace and the tasks they will perform remaining subject to specific arrangements between the HEI and the companies (Deissinger, 2000). Regarding the role of the state, it is similar to what is found in VET training, meaning it has the function of regulator of the work conditions. However, different from VET, in the dual study programs, the state position does not incorporate the role performed by the trade unions, which in dual study programs is practically non-existent (Graf, 2015).

A survey conducted by Hesser and Langfeldt (2016) shown that, due to this bottom-up orientation, dual study program offering is highly concentrated in applied subjects, mostly in engineering sciences, informatics and business sciences. Based on data from 4,118 programs, the survey revealed that the top 5 disciplinary fields respond for around 78% of all offered programs, with business management responding to 27%, mechanic engineering 22%, electronic engineering 10%, civil engineering also 10% and informatics 9%. The same survey did not found a single program in soft pure study areas such as history and cultural studies, neither in hard pure like physics or mathematics. Moreover, the research also exposed that most dual study programs are being offered by universities of applied sciences (59%), followed by the Duale Hochschule Baden-Württemberg (20%), vocational academies (16%) and finally research-based universities (3%). According to Dietrich's (2017) view, one reason for this extremely low availability of programs on non-applied areas is due to the fact that few or no companies offer work positions to such profile of candidates. Since being employed is a pre-requisite to enter in a dual study program, those areas received naturally less attention.



In respect to internships, the broad range of offers and the low level of standardization are raising discussions over the actual role internships play in the formation of new, better prepared professionals. Especially the trade unions see with particular concern the activities performed by interns. They argue that the internships offer an economic advantage for companies only, as often there is no actual distinction between the activities performed by interns and full-time employees. In such a context, interns are seen simply a source of cheaper, yet highly qualified labour. Such discussion is also detailed by Schmidt and Hecht (2011) in the study *Generation Praktikum*. If graduates are contracted as interns but are effectively replacing full-time employees, argue the authors, they must be treated as employees in regard to labour and collective bargaining laws. Naturally, the purpose of the internships should not be to replace a full-time worker with cheaper workforce but give the opportunity for students and graduates to build competences associated with practical work and increase employability. In this respect, especially after the Bologna reform and other developments at EU level, the design of internship initiatives in Germany are more focused on learning outcomes, competencies of students and their employability than before (Cleuvers, 2015).

This change in the status of the internship; from a source of cheap labour to a place of learning and working opportunities, has been confirmed in two recent studies, one conducted by the consulting company Clevis Group in 2017 and another by Employer GmbH, one of the largest internship portals in Germany. In the *Praktikantenspiegel 2017*, from Clevis, around 13 thousand students and 7 thousand companies were surveyed and the research concluded that 73% of higher education students are satisfied with their internship, an increase of 20% in comparison to 2009. Satisfaction is particularly high in the areas of multimedia, IT, consumer industry and engineering, with satisfaction rates above 80%. The least satisfied students came from liberal arts, research and health services, with approval rates around 65% on average. In another survey, this time conducted by the BIBB and oriented towards companies, it was concluded that around 70% of the surveyed firms offer some form of internship, being the percentage higher in SME. Yet surprisingly, on average only one in every five interns get the opportunity to remain employed after the end of the internship period.

Regarding the legal framework in Germany, the duration and termination of obligatory internships is determined by the HEI in accordance with state and federal law. A written contract between student and company, although not mandatory is often used. In respect to voluntary internships, duration and working hours are arranged between the organization and intern, yet regulated by German Labour Law in the form of the Works Constitution Act and subjected to Law of Minimum Wages, when applicable (interns on voluntary internships lasting more than three months are entitled to minimum salary. Mandatory internships are not subjected to this rule). According to the *Generation Praktikum* study, 40 % of surveyed internships in HE were unpaid (excluding internships in the medical and education field). In the remaining 60% of paid internships, interns received on

average 3.77 Euros per hour. The average working hours for internships in Germany is of 7 hours per day.

Traineeships

In respect to traineeships, German academic literature makes little distinction between trainee programs and internship programs, at least in terms of nomenclature. Therefore, specific studies are rare. Nevertheless, a few data is available. For instance, Schmidt and Hecht (2011) remarked that traineeship programs are not yet the most popular job-entry strategy for German graduates. However, this modality is gaining strength, especially in business and engineering. Only around 6.5 % of HE graduates enter in a traineeship program right after their graduation¹. This percentage increases to around 16% if one looks two years after graduation and 38% if one considers number of persons who did a traineeship independent of time span. About 55 % of the internships lasted up to three months. However, it is important to acknowledge that the level of commitment invested in the development and implementation of such programs is high, therefore there are not as many places in such programs as there are in internships, for instance. Consequently, it is only natural that 'only' 38% of graduates are doing traineeship (Hädicke, 2017).

It is also true that 'pure' hard and soft sciences, as well as areas wherein job training is mandatory (medicine, law, education, journalism) have the lesser quotas of traineeship offers. The highest quotas can be found in the 'applied' areas such as business, engineering and IT. This is only natural since part of the whole purpose of the trainee programs is to develop professionals for managerial jobs and not specialists. That entails that training in management is practically compulsory in such programs. In other words, even for people coming from hard sciences will not be trained as 'scientists' but as managers with a scientific background (Hädicke, 2017). Moreover, Koschik (2017) remarked that for hard pure areas such as chemistry or mathematics, companies recruit persons for specific, pre-defined tasks, normally recruiting at master or doctoral level, which conflicts with the main purpose of the traineeship. On the other hand, Schmidt and Hecht (2011) affirm that areas such as humanities, cultural and political sciences, even though not being the main 'target' for trainee programs, posted the highest relationship between graduates doing traineeships in contrast with ones employed in full-time jobs. It is believed that the reason behind such high traineeships levels in those areas, in contrast with the hard sciences for instance, is connected to the limited offer of professional opportunities for graduates in those fields and the large number of graduates in relation to potential jobs.

¹ The research actually uses the term 'internship after graduation'. Yet, as we at WEXHE have classified this type of WBL delivery as traineeship, the term was changed here.

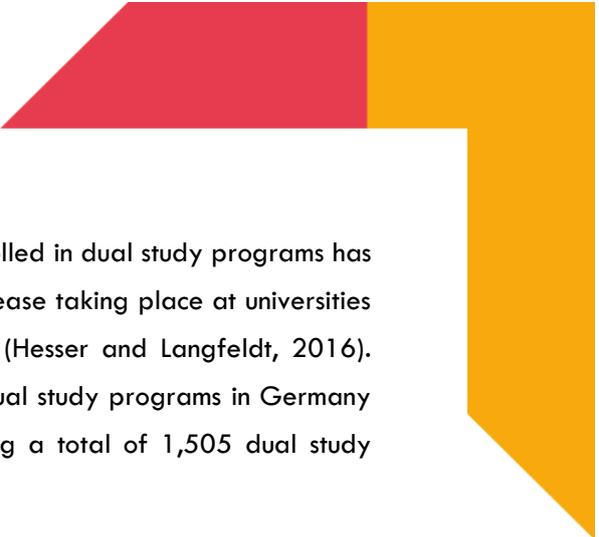
In the *Generation Praktikum*, researchers evaluated also the level of satisfaction with traineeships in Germany. Although regional differences among number, duration and payment were significant, in general, 55% of the traineeships were considered satisfactory. Yet, around 10% of the programs did not meet the graduate's expectations either due to poor learning opportunities, low remuneration or the feeling that they worked full-time like a normal employee and not a learner. According to Hädicke, (2017), dissatisfaction among the more consolidated programs, such as the ones from large industrial conglomerates, are rare. However, as mentioned early, because there is not a very clear definition of what constitutes a traineeship, some programs which call themselves traineeship are in fact much closer to an internship. Or, in other cases, participants end up doing more 'manual' labour than expected from a trainee program, which is often advertised as being of a managerial level.

5. WBL IMPLEMENTATION: DRIVERS AND BARRIERS

Although different in their *modus operandi*, all modes of delivery seen in this research share some drives and barriers. In the specific case of Germany, despite the low levels of unemployment, employability is an important driver in all modes. Moreover, students are all particularly concern with the insufficient level of practical experience offered in HE and the development of transversal competences. Moreover, due to the warmed German job market, companies are concerned with attracting the best students as early as possible, offering interesting and attractive internship and trainee programs, as well as demonstrating a willingness to cooperate with HEIs. The barriers, on the other hand, are more specific, as the next paragraphs will describe.

Dual studies and internships

In respect to the dual study programs, literature highlights two main drivers supporting its development. First is the concern with employability and the perceived need of developing in students both disciplinary and general competences more associated with practice. In this case, the offering of new dual study programs was mainly supported by state-level initiatives, especially from highly industrialized German regions such as North-Rhine Westphalia, Bavaria and Baden Wunterberg (Dietrich, 2017; Hesser and Langfeldt, 2016). Second, the German record low levels of unemployment made skilled labour force a valid asset, and firms see in the dual study programs an invaluable channel to attract and retain talented young professionals. Therefore, market initiative can be also considered a strong driver for the development of dual study programs (Graf, 2015). In addition to these two main drivers, Hesser and Langfeldt's (2016) survey also revealed that the chance to receive a salary while studying, the smaller student groups, and the more flexible modes of delivery offered at dual study programs are also perceived, especially by students, as positive attributes of this mode of WBL.



As a consequence of those conditions, the number of students enrolled in dual study programs has shown a steady growth in the past 10 years, with particular increase taking place at universities of applied sciences in detriment to research-based universities (Hesser and Langfeldt, 2016). According to the BIBB, the total number of students enrolled in dual study programs in Germany increased by around 137% between 2004 and 2014, reaching a total of 1,505 dual study programs and around 95 thousand students enrolled.

Naturally, this rapid expansion has also highlighted problems and concerns with the system. Graf (2015) raised three important challenges and threats that need to be taken into careful consideration. The first one refers to the low levels of standardization seen in the dual programs across Germany. This flexibility, on the one hand, contributed to the rapid expansion of this type of programs but on the other made it difficult to establish a clearer design for the integration of the work and the academic phase. This lack of conformity also makes it difficult for prospective students to obtaining information about the study programs and government and statistical agencies to generate more precise statistics about the number and the typology of such programs.

The second issue is connected to the implementation of the bachelor degree after the Bologna process. The reduction of the time duration of bachelor programs to three years created a major challenge for dual programs to conform their in-company activities and scientific instruction within the three years of bachelor programs. Moreover, a debate also exists over how to account for the in-company training yours in terms of ECTS credits.

A third issue refers to the recent upgrading of vocational academies into HEI status (dual study programs were originated in the vocational academies which replaced the professional training schools from the 70's). Those institutions, when relabelled HEI, start to engage in research activities. Yet, there are reasons to believe that this involvement in research might limit the involvement of small and medium enterprises in dual study programs since their major interest is in the practical relevance of programs and not in financing research activities (Graf, 2015). Finally, Dietrich (2017) raised a fourth barrier, associated with the difficulty students have in finding a position on dual study programs. Because students need to have a formal contract with the partner company before joining most dual study programs, and the majority of programs do not intermediate the process nor guarantee work places, it is the sole responsibility of the student to 'get employed'. As firms have their own selection criteria, which is different from the *numerus clauses* normally adopted by German HEIs and in most cases much more demanding, students often have difficulties in finding a place in a dual study program, especially when contrasted with traditional ones (Hesser and Langfeldt, 2016). Naturally, this rigorous entrance filter summed with the demanding aspects of dual study programs, makes dual students very sought after by the market upon graduation.

Regarding drivers and barriers to internship development (in the sense of *Praktikum*), the *Praktikanten Report* (2014) has shown that the main driver for students to join in internships program is to have a better understanding of the future career (81% of respondents agreed to that sentence), followed by facilitating the entry into the professional life (75% agreed). Other relevant aspects include optimizing the curriculum (71%) transfer theory into practice (66%), and the opportunity to expand the network of contact (61%). As for barriers, the survey showed that the main reasons students would consider an internship to be unsuccessful are associated to: a) an uninviting work atmosphere, b) the lack of support from company, c) insufficient learning opportunities, d) the low level of interest in the specific tasks to be done, e) lack of appreciation and recognition for the work done and lastly f) when the company does not offer the chance for interns to remain employed after the internship period. According to the 2013 BIBB, payment has a low impact on internship satisfaction. On the other hand, factors such as good learning opportunities and relevant working scope, as highlighted by the *Praktikanten Report*, played a much more influential role.

Traineeship

In respect to traineeship, one needs to differentiate the drivers for companies and for graduates. According to (Hädicke, 2017), the main driver for firms is the opportunity to, as early as possible, select and recruit the best potential graduates. Moreover, firms, more and more, are concerned with forming future leaders for their organizations, who embrace and are familiar with their corporate culture. In this sense, the trainee programs play an important role as one of its objectives is to form people to assume managerial positions. Lastly, traineeships are a tool that companies use to develop in graduates the sort of transferable/generic competences which are normally missing in their formal education. This driver is particularly relevant for this research as it shows the market concern with the lack of such form of education in HEs. Also according to Hädicke (2017), for graduates, many factors play an important role. First is the opportunity to do job rotation. Since it is common among graduates to leave universities with only a vague idea of career choice/preference; and knowing that a wrong initial career choice might be 'expensive' in terms of CV (specially in Germany, where short-term employment is not seen with good eyes), graduates are attracted to the 'look around before commit' alternative offered by traineeship. Second, at trainee programs participants are being prepared to assume leadership positions and, even though receiving on average 10-15% less than full-time employees during their trainee time, after finishing the program participants are often better paid than corresponding full-time employers. Lastly, most traineeships offer the opportunity for training in special skills, mentoring, and even the chance to live international experiences.

Moreover, HEIs can play a supportive role in fostering good traineeship experiences. The best prepared HEIs, other than simply showing the places available, some universities do a better job

at facilitating the transition from education to the workplace. It is done in the form of job fairs, business days, workshops, corporate visits and other similar initiatives. It seems that these activities help students to have a better understanding of the options they have available, the kind of people and working culture they will be engaging and eventually establishing a more direct contact channel to one or two firms. Experience shows that this helps not only in choosing a better-fitted trainee program, but also increase the hiring chances (Hädicke, 2017).

Entrepreneurship

As for entrepreneurship, Kliewe (2017) elaborates on drivers and barriers. For him, drivers could include a stronger demand for commercial application of research, either through a strategic alignment of the HEIs or as a funding policy – in this case, a demand for researchers to search for commercial applications in order to get funded could support the need for more entrepreneurial-oriented learning. In addition, Kliewe reinforce the importance of a more interdisciplinary view of entrepreneurship, which in Germany is still too oriented towards business management. The understanding that entrepreneurship is a ‘business-only’ disciplinary area suppress the development of more entrepreneurial activity in promising fields such as engineering or even the fine arts. The diffusion of shared prototype labs or the capacitating of academics could contribute to the improvement of this scenario. Last but not least, German academics, especially from research-based universities, often seen entrepreneurial activities as an ‘exploitation of the research’, defending a more ‘Humboldtian’ model of science. Moreover, the natural resistance to change from academics can also be considered a barrier.

Regarding more ‘macro’ trends, Kliewe sustains that record low unemployment rates in Germany reduce the need for entrepreneurial activity as an alternative for employment, as happened in the USA and is still happening in parts of Europe after the 2008 economic crisis. Yet, on the other hand, more than ever entrepreneurship is seen by young people as an attractive alternative to eight-to-five career jobs, driven by the not always accurate search for flexibility and independence.

6. WBL IMPACT

Unfortunately, there is no systematic monitoring of the impact of WBL practices in Germany beyond the assessment made by the programs themselves. There are, however, a few studies conducted by career service companies on the student’s perception over quality internships and traineeships as well as statistics regarding the offering of dual study programs. Such studies demonstrated an increasing satisfaction of German students and graduates with their internship/traineeship

experiences as well as an increasing number of dual-study programs offering, which somehow demonstrate a still increasing interest such types of programs arouse in students.

In respect to dual-study programs, a study conducted by Hesser and Langfeldt (2016) showed that the number of dual-study programs offered by German HEIs increased from 40 thousand in 2004 to around 95 thousand in 2014 (or 137% in 10 years). The number of companies offering places at dual studies also increased from almost 20 thousand to 40 thousand in the same period. This expansion demonstrates the increasing interest in this type of programs from students, HEIs and companies. As mentioned early, 72% of students who engage in dual studium do it because it's stronger links with practice and 66% because they see in it better changes to enter in the labour market, which evidences the relevance of WBL in both offering a better understanding of the world of practice and increasing employability. Finally, the study analyzed the set of generic competences more often required by dual study students. Around 70% of respondents said organization management is strongly required to perform the demanded activities, 70% mentioned proactivity, 66% mentioned time management and 76% mentioned the capacity to work independently.

In respect to internship and traineeship, the Praktikantenreport 2014 showed that, more and more, students perceive internships as an opportunity to facilitate entrance in the labor market (71% agreed with that in 2015 versus only 46% in 2009) and improve the connection of theory and practice (66% in 2014 versus 56% in 2009). Finally, the Praktikantenspiegel 2017 report showed that 84% of interns maintain a straight relationship with their employer after the internship period, which is an indication of higher employability changes for those who make an internship.

7. CONCLUSION

Although not always referenced as WBL, making use of the work environment as a vehicle for learning is relatively well-established idea in Germany. This tradition dates back from the 70's, with the establishment of the first vocational schools; a model which was later transferred to higher education. Internships are also popular in Germany, especially with the further development of the universities of applied sciences which included them as quasi-compulsory elements in their programs. More recently, traineeship and entrepreneurial activities have gained momentum. Trainee programs were first introduced by large multinational corporations, but nowadays can be found also in SMEs. German graduates embraced it mainly because they see it as a good opportunity to have a better insight of different fields of work specialization and the possibility of ascend to managerial positions. As per entrepreneurship, the last decade has witness an increasing interest, with large cities such as Berlin and Munich becoming centers of excellence.

In respect to disciplinary areas, WBL activities in Germany are still concentrated on the applied sciences, especially in business and engineering. Part of this concentration is explained by the strong institutional differences established in the German higher education system between universities of applied sciences and research-based universities. The first are clearly embracing, via different formats, a collaborative relationship with external enterprises as well as a more practice-oriented formation. The second, on the other hand, is still closely connected with the Humboltian tradition of a holistic education. Consequently, study areas which can be only found in research-based universities, such as literature, physics, mathematics; etc. received less attention when it comes to work integration.

In conclusion, it can be said that the WBL context in Germany is favourable and well developed, especially in contrast with other EU countries. This has to do not only with the long-standing tradition of vocational education but also with the support of regional policies and the development of the universities of applied sciences, which have embraced a practice-oriented education, consequently fostering the development of WBL activities at multiple levels. It is very likely, therefore, that interesting transferable cases of good practice arise from the German examples, in line with the WEXHE purpose.

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