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Report

„German approach and experience of development of occupational standards“

about

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Executive Summary

This report focuses on the key concepts the German initial vocational education and training (Dual System) is based on. It is intended to provide background in order to evaluate differences to other vocational training methods worldwide used. It is important to note that the dual training in Germany has a long tradition, is complex and cannot be copied one to one. The report covers beside general definitions, best practice examples and also lessons learnt in order to adapt this experience.

The first two chapters focus on the common challenge of interaction between education systems and labor market requirements. It covers national and international frameworks aligning work and educational qualifications.

The different practice to develop and use occupational standards in Germany compared to most other countries in the world is specified. Germany has no single, isolated occupational standards; instead an integrated concept to develop training regulation as educational standards including the occupational standards is used. The legal framework “vocational training act” provides the basis for this way of training. Some key issues are covered in chapter 4 The overall success of this way of education mainly relies on the following aspects:

- Cooperation between social partners, employers and government
- Learning within the working process
- Acceptance of national occupational standards
- Qualified instructors
- Institutionalized occupational research and advisory service

The expectation towards a certified young person being trained in a 3 years lasting initial vocational training period is high. The full vocational capacity characterizes the German term “Beruf”.

Chapter 5 will give an insight how structured the development process of training regulations has been evolved during the last 40 years. In sum the knowledge about requirements of the labor market is fundamental in order to shape and update educational programs. The direct involved parties must take part in that process to achieve sustainable acceptance. Beside the supporting institution BIBB (Federal Institute for Vocational Education and Training) good methods to evaluate the labor market are necessary. Chapter 6 gives examples how research can support this process.

The practical organization of VET is covered in chapter 7. Historically the chambers have an outstanding role. Financing and supplying sufficient training possibilities for in-company training is an ongoing challenge in Germany, too. A good example how to cope with this problem is presented in Chapter 7.3. Finally the additional questions are covered in chapter 8.

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1 Interaction between work and employment system and education and training system

In our globalized world there exists in general in each country on the one hand a “Work and employment system” (Labour Market) and on the other hand an “Education and training system” (see Figure 1). Therefore we have in all countries normally for each of the both systems country specific content and data structures which depend on the respective country specific work and education culture. And of course in the context of the development of the society these cultures are changing permanently and so the content and data structures of the systems too. Gross structure data to the year 2014 of the “Work and employment system” (Labour Market) and the “Education and training system” in Germany shows the first figure.



Figure 1 “Work and employment system” (labour market) and “education and training system” in Germany

Accordingly there are on the one hand in Germany almost 41 Million employees. These employees work in approximately 25.000 different occupations respectively professions and they work in just about 2.5 Mio. companies. To the 25.000 different occupations there are within the labour market and companies in Germany probably much more occupation or job titles because in each company exists normally many jobs with company specific job or workplace characteristic / description. On the other hand there are in Germany circa 5 Million trainees and students and they learn or study all together in different Vocational Education and Training (VET) schools or colleges, companies and high schools or universities. The trainees and students have

currently the opportunity to learn or study in approximately 2.500 different training and study programs.

Under didactical work and education aspects the interaction between the occupations respectively professions and the training and study programs is initially important. Therefore one main question is in which quantity and quality relationship and interaction here on the one side the **“work occupations”** (professions) and on the other side **“training or study occupations”** (professions) stay. The curricula and didactical answer of this special question is in general: Each interaction is very country specific. It depends on the country specific education, training and study approach for the different education, training and study programs.

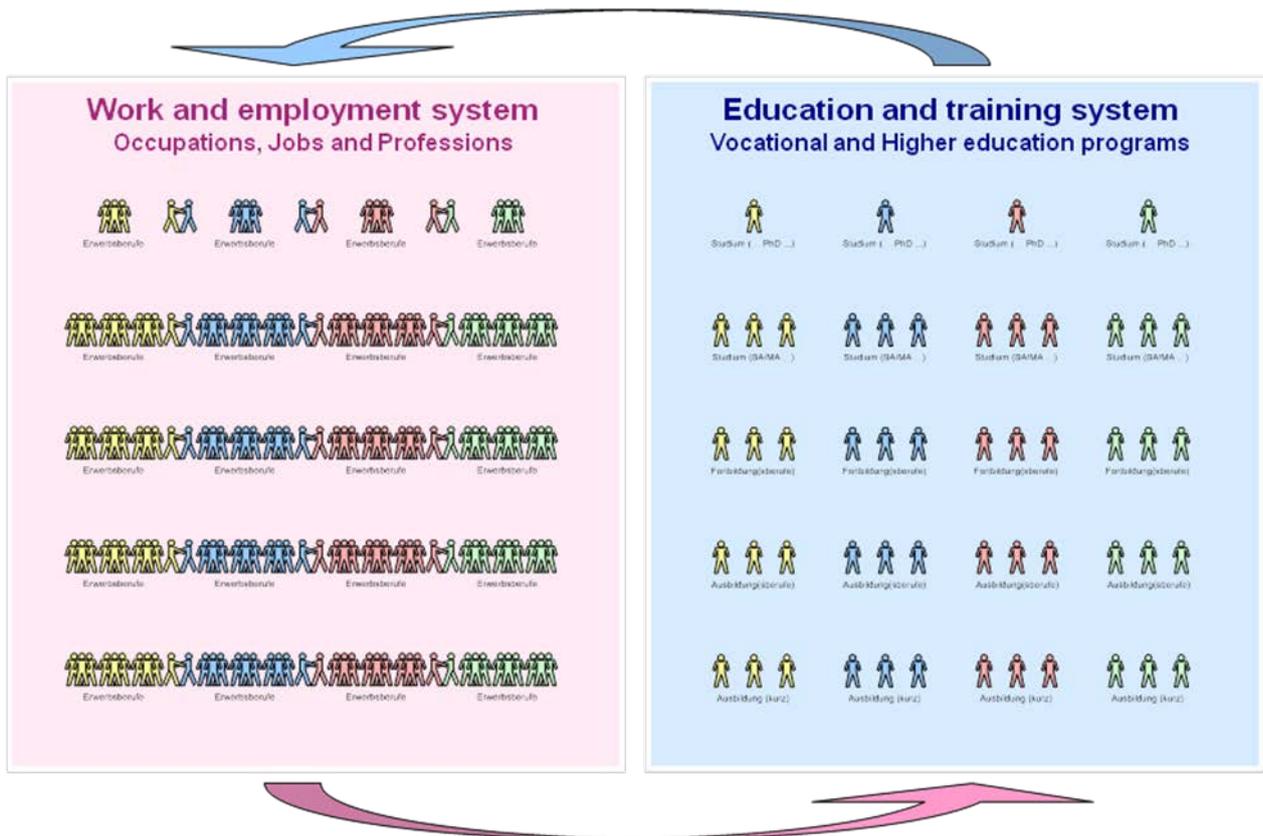


Figure 2 Relationships between different “work occupations” and “training or study occupations” on five different skill and qualification levels

For all together approximately 25.000 different “work occupations” (job titles) respectively professions within the labour market and companies in Germany there is not one to one 25.000 different training and study programs in the “Education and training system”. To the circa 2.500 different training and study programs we have in average for each ten “work occupations” only one “training or study programs respectively occupations”.

With regard to the international construct and design of **“occupational standards”** in Germany we don’t have, in this sense, for each of the approximately 25.000 different occupations respectively professions one “occupational standard”. But like around the world and with a not at all common definition of “occupational standards” we can say that each training and study program respectively occupation more or less based or developed in the context of a predefined occupational standard. We have therefore a strong curricula and didactical link between the occupational standards and the education, training and study programs (they are mostly education standards). From this point of view we have in Germany also approximately 2.500 “occupational

standards”. In that meaning and as a result, occupational standards can thus be equated almost with the appropriate education, training and study programs respectively training occupations.

The concrete curricular and didactical relationships and interaction between the occupations or professions and the generic “occupational standards” and the “training or study programs or occupations” in Germany are very complicated and depend in detail on the occupation or profession type and especially on the qualification or skill level. So we have some cases and examples there exist for the “work occupations” no training or study program at all. And for some other occupations or professions we have exact for each occupation or profession a specific training or study program. But for the most of the circa 25.000 different occupations or professions within the labour market and companies we look in Germany at first for groups with similar occupations or professions (for instance a group with ten or more similar company jobs) and then we defined for thus occupational group for example only one “generic” education and training or study program. That means in the same way, that we for all of the circa 25.000 different occupations or professions in Germany only have approximately 2.500 different and specific training or study programs. With other words in Germany we don’t have for each occupation within the labour market one state recognized occupational standard. But please note in general that the term “occupational standard” in Germany is not very common and often used.

An ideal and greatly simplified relationship between the “work occupations” and “training or study occupations” shows Figure 2. Here exist for each yellow, blue, red etc. “work occupation group” on each of the theoretical five skill respectively “work qualification” level (indicated in the figure 2 with different rows) exact one “training or study program or occupation” on the respective same qualification level. But to the simplified relationship is always a specific interaction between the both work and education systems to consider. On the one hand there is an impact of the work system respectively labour market towards the education system (see the red arrow in the figures). This impact of the education, training or study programs (design, content...) can range between very closely to very wide. One important basic question to this direction is how the education and training system can supply the qualified persons which are capable to fulfil all the skill and qualification needs of the labour market. The answer in detail is complex and we can see in the countries around the world there are very different didactical ways and approaches. Considering the other direction from the education to the work system, the education and training system will also have an impact to the work system respectively labour market (see the blue arrow in the figures 1 and 2). In Germany we call this impact a curricular prospective influence which is didactical and economic motivated. And a claim in general is that in minimum the qualifications offered must meet the skills or qualifications required. Therefore the work and employment and the education and training systems are both not autonomous systems but between the systems there is always a specific interaction which depend in detail on each country specific didactic approach. This interaction can in general also be described as a feedback loop between the world of work and the world of education and training.

If we have a closer and concrete look on the work and employment system we can see different occupation structures with separated types of work areas or special groups or fields of occupations and jobs. These different occupation groups or fields are in the figure 2 indicated with different colours. For example: To the civil engineering sector we can following see e.g. some concrete “work occupations” and job titles:

- Architects; Construction project manager
- Urban planner; Landscape architects

- Civil engineers; Inside out architects
- Building accountant scaffold (assistant); Chimney constructor
- Brick layer; Bricklaying labourer; Brick technician; brick and stone mason
- Concrete pump operator; Construction electrician ...

Of course there are many more occupations in this sector and subsectors. But the important question in general is which education, training and study programs fits didactical and curricular in a best way to the different requirements of all the occupations and jobs in this sector or occupation field. Because each country has its own specific education and training system the answer here is also country specific and especially in regard of possible country specific “occupational standards”. Based on a general structure of an education and training system the most answers include possible “occupational standards” with respective education, training and study programs within the following common education areas:

- Academic studies,
- Further vocational education,
- Initial vocational education and training (VET),
- General education ...

Within each education and training area you can around the world award country specific qualifications as the result of the learning process on a specific qualification level based on the respective country specific education, training or study programs. In many countries the development of such country specific education, training or study programs based also on predefined country specific “occupational standards”.

For the whole process of the development of such “occupational standards” and / or country specific education, training or study programs an important precondition is: Detailed data about both, the work and employment system and the education and training system. In all countries in general different statistics exists to both systems as an important source of these data and information's. In addition research results and reports with more details to both systems are also very important. Especially necessary are different work and job analysis as well as education and training studies because the changing of work and education is permanent and sometimes very quick.

One significant basis and structure for all of the work and education data and information's are all system and area specific classifications and frameworks. So we have for the whole world very different international classifications and each country have in addition normally their own national classifications and frameworks.

2 Classification and frameworks of occupations and qualifications

Classifications and frameworks for different systems or society areas exists mostly on international, European and national level. Big companies often have their own specific “job classification” or framework. Company specific workplace descriptions consisting of work tasks and duties.

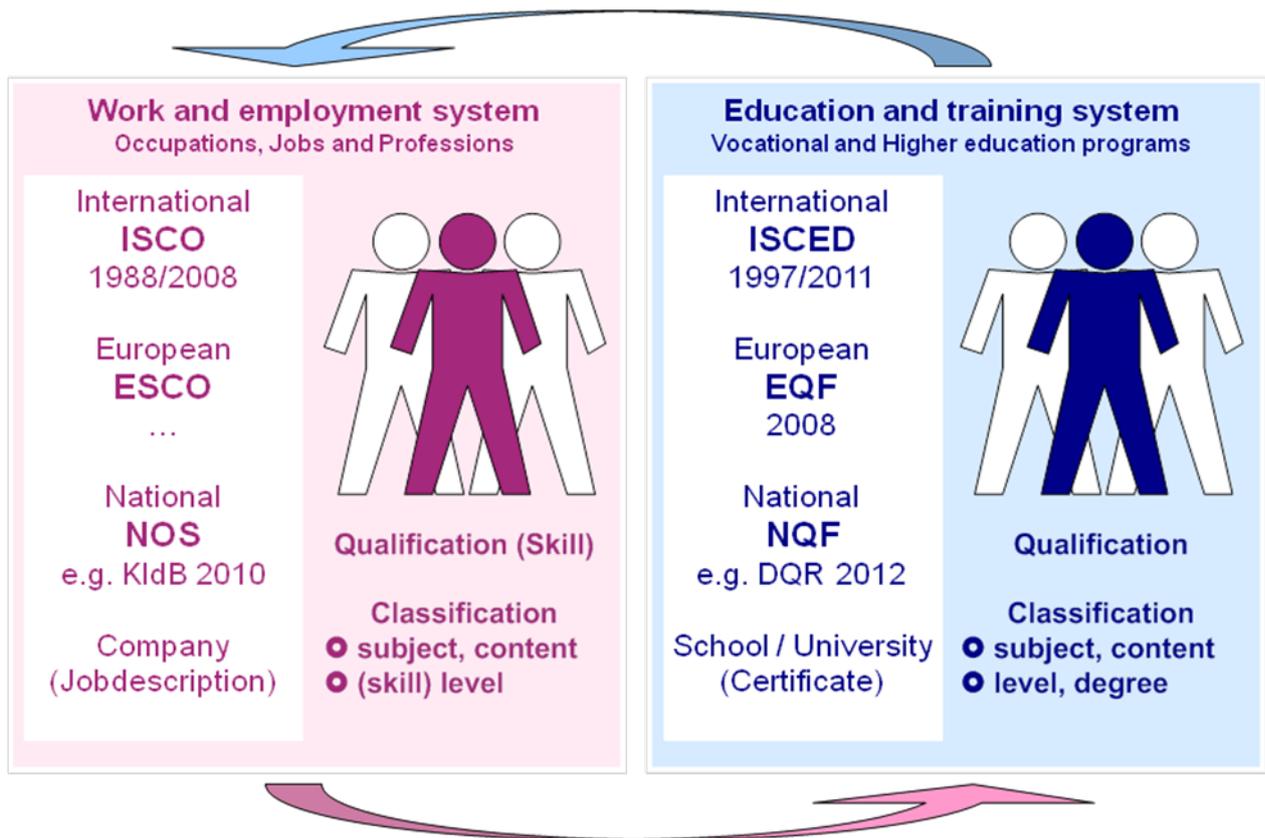


Figure 3 Classifications and frameworks of the work and the education system

For the “work and employment systems” (labour markets) on international level exist - developed by the “International Labour Organization” (ILO) - for a long time the ISCO-88 as a well recognized “International Standard Classification of Occupation” (ISCO). Since the year 2008 we have a new version ISCO-08 and new published with more and important details in 2012¹. Accordingly exist developed by the UNESCO for the “education and training system” the “International Standard Classification of Education” (ISCED) in the version ISCED-97 and in the newest version ISCED-2011². With comparable classification criteria the ISCO-08 classified on the one hand the different work occupations respective “work qualifications” by subject and by

¹ Comp. ILO International Labour Office (Hrsg.): International Standard Classification of Occupations (ISCO-08). VOLUME 1 Structure, group definitions and correspondence tables. Geneva: ILO, 2012

² Comp. UNESCO United Nations Educational, Scientific and Cultural Organization: REVISION OF THE INTERNATIONAL STANDARD CLASSIFICATION OF EDUCATION (ISCED). Annex International Standard Classification of Education 2011. Paris: 5 September 2011

skill/qualification level (see figure 3). On the other hand the ISCED-2011 classified the different education and training and study programs also by subject/specialisation and by education/qualification level/degree. One comparison of both ISCO-08 and ISCED-2011 classifications is shown in figure 4.

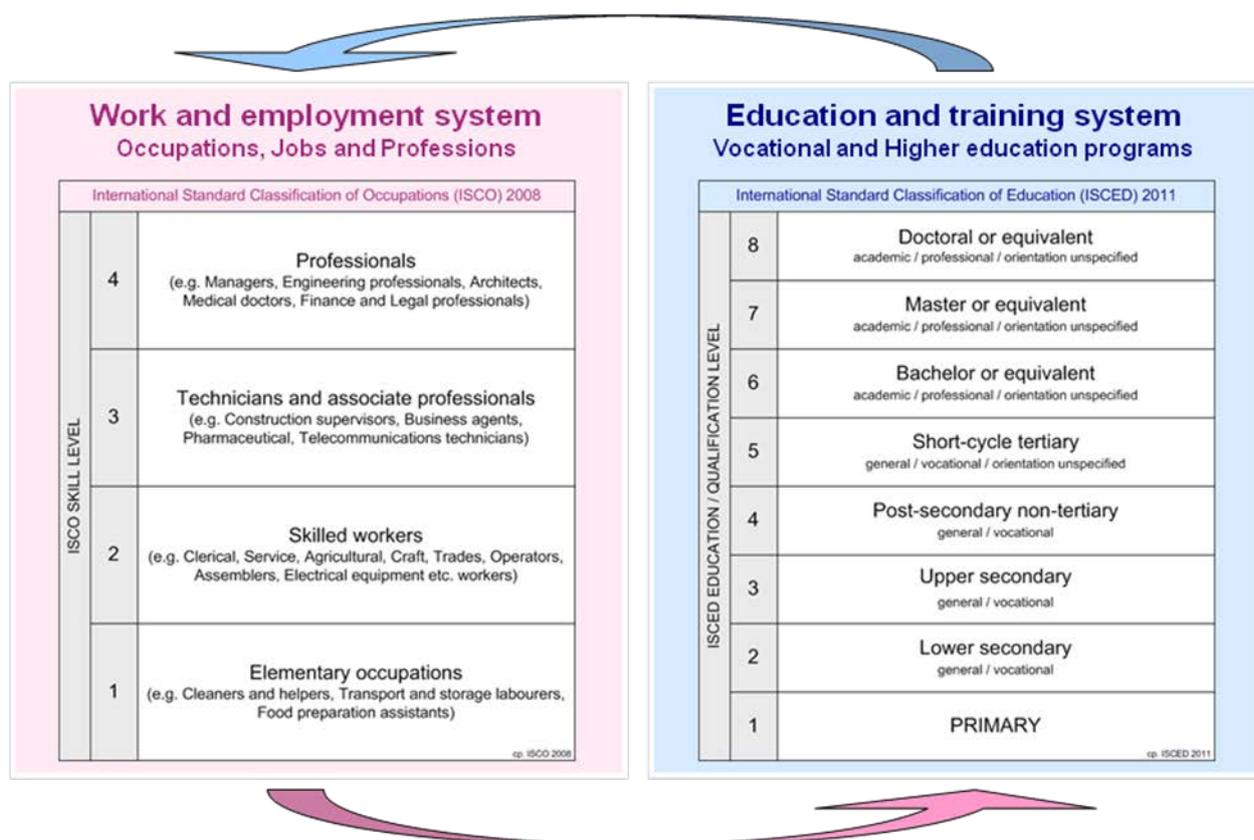


Figure 4 ISCO and ISCED: International classifications of work and employment and education and training system

In a first view there is a mismatch between the numbers of the different qualification levels. Moreover ISCO-08 defined official four “skill” level and ISCED-2011 eight “education” level. One important recommendation is here because ISCED-2011 use the term “qualification” for the education result too to use for the ISCO-08 term “skill” within the work and employment systems also the term “qualification” or better “work qualification”. One other reason is because the “skill” or better “work qualification” is or should be mostly identical with the achieved “qualification” within the education and training system. But we have in general also to distinguish very clear the “work qualification” from the “education and training qualification”.

Comparing ISCED-2011 with ISCO-08 there is a mismatch in the amount of skill/qualification levels.

In regard to the subject ISCO-08 classified the occupations in “MAJOR, SUB-MAJOR, MINOR AND UNIT GROUPS”. ISCED classified in contrast the education in 9 broad groups and 25 fields of education. Because here is also a clear mismatch the basic criteria and structures of both classifications doesn’t fit together very well.

Many other classifications in the world like the European frameworks and the most national classifications of countries in east and west have often a close connection with the international ISCO-88 or ISCO-08 and ISCED-1997 or ISCED-2011 classifications. Thus a high accordance and match of the structure, definitions and levels of the country classifications is especially a good prerequisite for international comparisons and definition of international standards too.

Furthermore and for example the “European Qualification Framework” for Lifelong Learning (EQF 2008³) has for the education and training systems like ISCED-2011 also eight qualification levels.

As well we can see in the last years in many countries of the world that they start also activities to reform their classifications, frameworks and standards for occupational and educational qualifications. Innovation and improvement of the quality respectively work and education results are the common main aims. In this context stay mostly also the introductions of different “Quality Assurance frameworks” which are very important for a good innovation and improvement process support. But classifications and definitions of occupation and education standards are at the same time also important prerequisites. Following we have a short look at the newest occupation classification (KldB-2010) and qualification framework (DQR-2013) in Germany introduced in 2010 and 2013 (see figure 5).

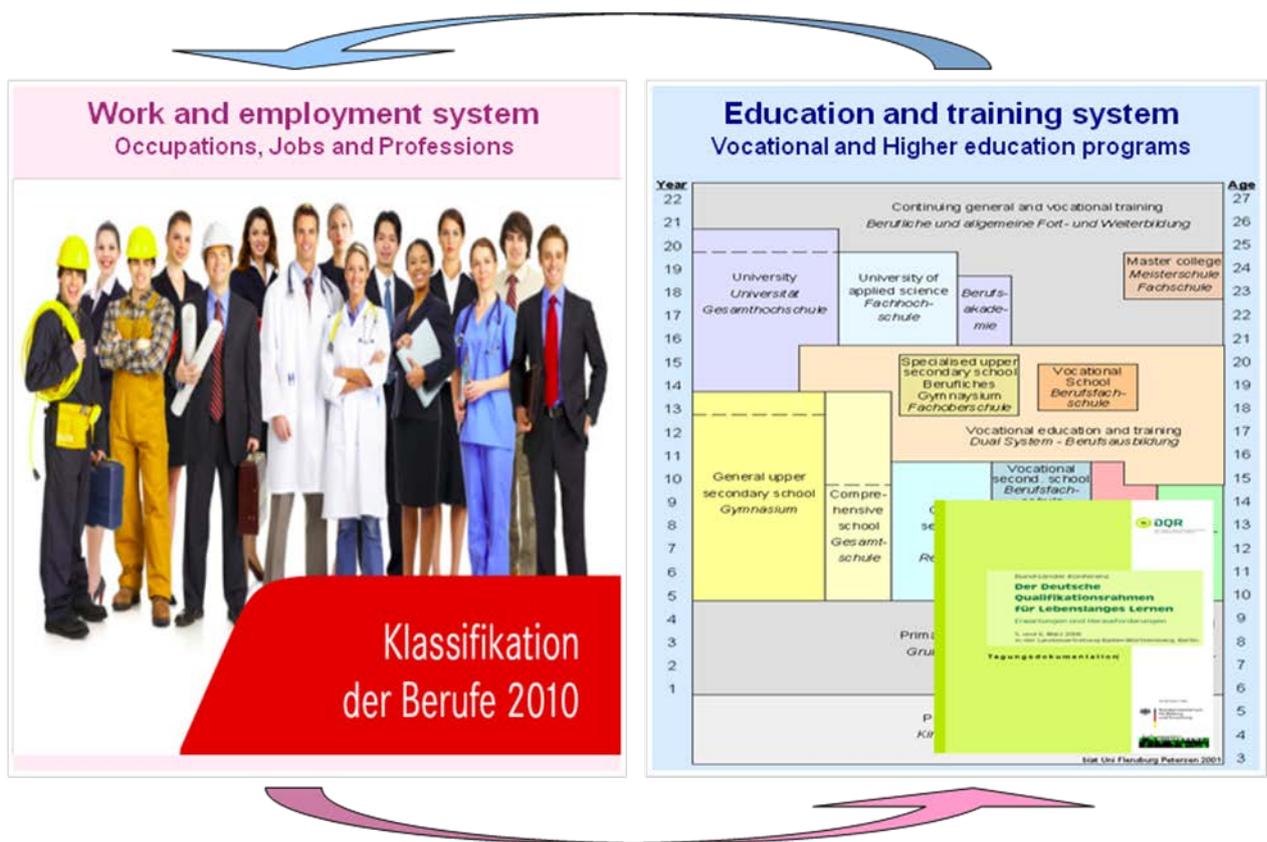


Figure 5 : Classification, structures and framework of occupations (KldB) and qualifications (DQR) in Germany

The national classification of occupations in Germany - called KldB-2010 - was introduced in 2010. This framework classified all occupations by content or specialisation and “qualification needs” level or “requirement level” (Anforderungsniveau). Like ISCO-08 the German occupational classification distinguished also four “qualification” level which more or less based on the same definition and structure as the four “skill” level of ISCO-08.⁴ They start with elementary occupations, helpers etc. and end with high complex work and activity requirements (see figure 6

³ Comp. European Communities: The European Qualification Framework for Lifelong Learning. Luxembourg: Office for Official Publications of the European Communities, 2008

⁴ Comp. BA Bundesagentur für Arbeit (Hrsg.): Klassifikation der Berufe 2010 - KLDB 2010 Band 1: Systematischer und alphabetischer Teil mit Erläuterungen. Nürnberg: Bonifatius, März 2011. BA Bundesagentur für Arbeit (Hrsg.): Klassifikation der Berufe 2010 - KLDB 2010 Band 2: Definitorischer und beschreibender Teil. Nürnberg: Bonifatius, Mai 2011

left side). The structure of the German classification of occupations is different to ISCO-08 but for comparison mapping keys are available. The German KldB-2010 is structured in 10 occupational ranges, 37 occupational major groups, 144 occupational groups and 700 occupational sub groups and 1.286 occupational sub-sub groups.

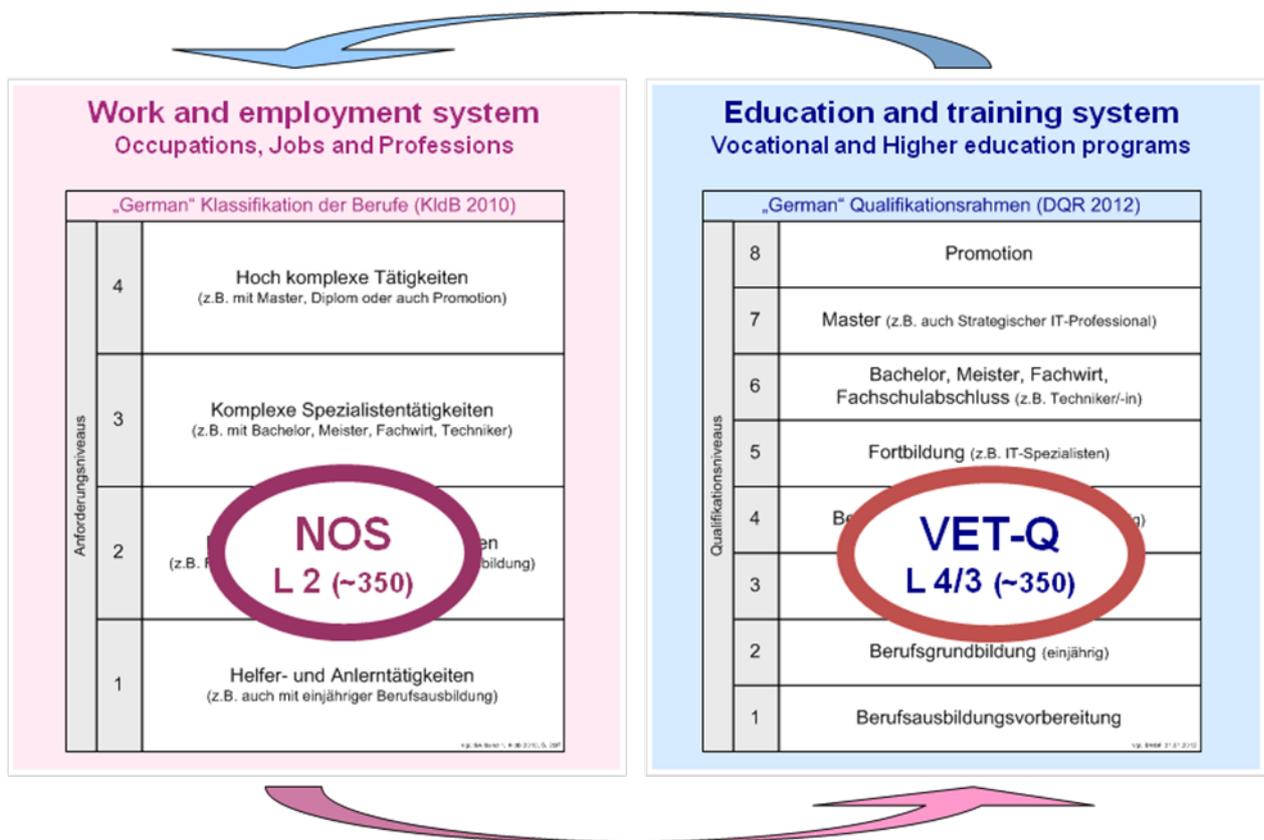


Figure 6 German classification of the work and employment and the education and training system

The national classification of occupations in Germany is at first very helpful for the statistics. So we can have detailed information over the “work and employment system” (labour market) in Germany in which about 41 Million employees in nearby 25.000 different occupations work. For example within one of the 37 classified occupational major groups with the code and name “26 Mechatronics, energy and electrical occupations” we have ca. 1.200 different and respective “work occupations” on all the four “work qualification” levels. Annual employment statistics are based on this KldB-2010 classification. As an example the total amount of “26212 Occupations in the Building electricity” can be derived from the statistic. In 2013 we had about 240.000 employees in that group representing the “work qualification” level 2.

This kind of specific occupational information is especially relevant in regard of questions to state wide numbers and definitions of national occupational standards and corresponding education and training programs too. So we have for example with the “occupational sub-sub group” “26212 Occupations in the Building electricity” a very good starting base to create and design an occupational standard including an education and training program for this occupational group. For example the concrete result for this occupational group is the “training occupation” named “Electronics for energy and building” as a training regulation.⁵ In consideration and a view as an

⁵ Comp. BMWA Der Bundesminister für Wirtschaft und Arbeit (Hrsg.): Verordnung über die Berufsausbildung zum Elektroniker / zur Elektronikerin vom 3. Juli 2003. In: Bundesgesetzblatt Jahrgang 2003 Teil I Nr. 31, ausgegeben zu Bonn am 11. Juli 2003, S. 1114 - 1117

“national occupational standard” (NOS) this state recognised “training occupation” is one of the other all in all ca. 350 different state recognised “training occupations” in Germany which also qualified for the “work qualification” level 2 (see figure 6 left side).



Figure 7 : Nearly 350 state recognised “training occupations” in Germany on VET qualification level 3 and 4

In consideration to the example as a state recognised “training occupation” within the education and training system in Germany we must have a look too to the other system classification in Germany based on the “German qualification framework” called DQR⁶. This framework were introduced in 2013 and all the nearby 2.500 education and training and study programs in Germany can hereby classified especially in a first important step by qualification level (and/or degree). The DQR defined therefore in a main point eight qualification levels (see figure 6 right side) which are basically comparable with the eight qualification levels of the EQF and also with the eight education and qualification levels of ISCED-2011. In this sense the German qualification framework (DQR-2013) is a new instrument for the education and training system in Germany for more national transparency and comparability and international comparability too.

Within the new DQR it is e.g. further possible to evaluate the above example of the training occupation “Electronics for energy and building”. Based on the accordingly education and training program with a clear description in the new curriculum form of “learning outcomes” the achieved certificate can within the German framework evaluate as a Vocation education and training (VET) qualification on level 4 (see figure 6 right side). This occupational VET qualification on level 4 is one of the other ca. 350 different VET qualifications which in Germany on level 3 and 4 are possible. Furthermore we can see by the example the clear interaction between all of the “training occupations” on VET qualification level 3 and 4 which qualified for many different “work occupations” on “work qualification” level 2 (see figure 7). On the other side we can see the didactical and curricular influence from the occupations of the work and employment

⁶ Comp. BMBF Bundesministerium für Bildung und Forschung; KMK Sekretariat der Kultusministerkonferenz: Gemeinsamer Beschluss der Ständigen Konferenz der Kultusminister der Länder in der Bundesrepublik Deutschland, des Bundesministeriums für Bildung und Forschung, der Wirtschaftsministerkonferenz und des Bundesministeriums für Wirtschaft und Technologie zum Deutschen Qualifikationsrahmen für lebenslanges Lernen (DQR). Anlage zum Gemeinsamen Beschluss ... Berlin: Stand 1. Mai 2013

system on “work qualification” or “requirement” level 2 also direct to the “occupational standards” and “training occupations” on VET qualification level 3 and 4.

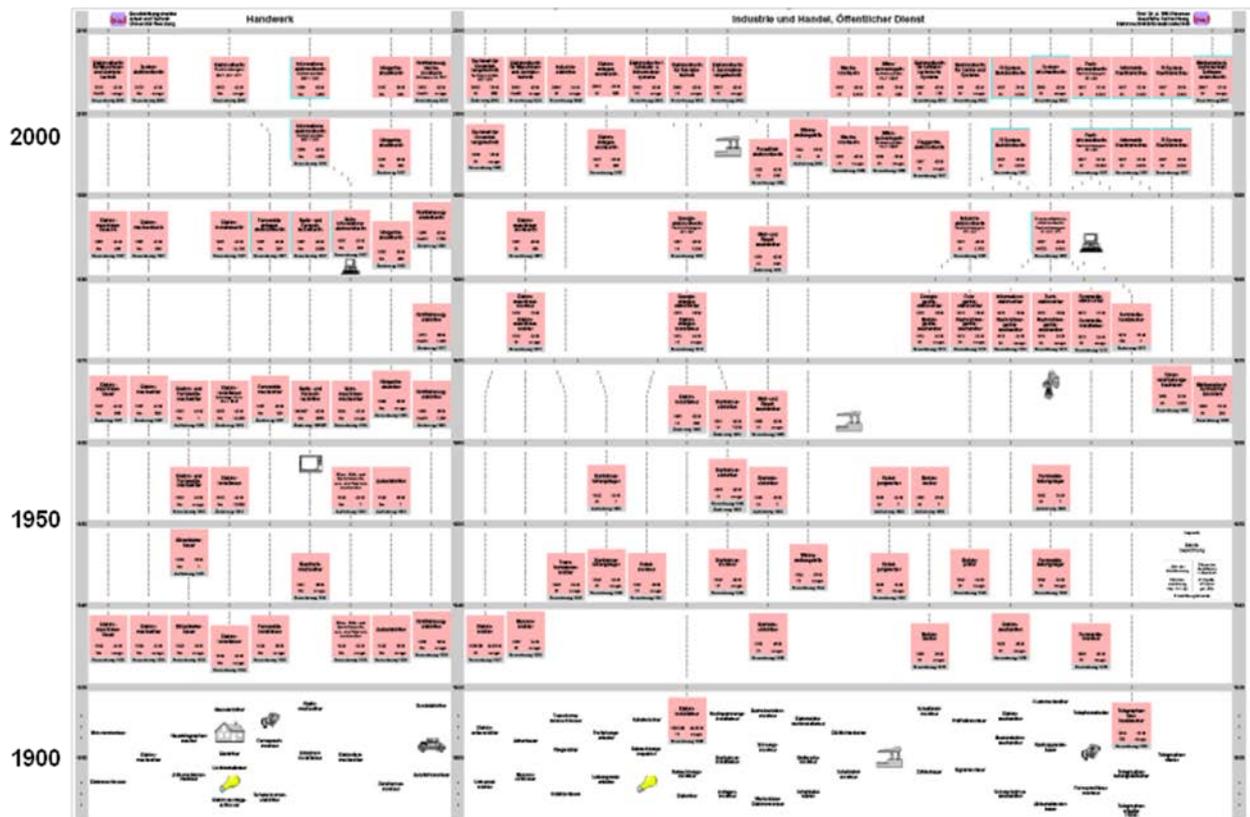


Figure 8 Development of the “training occupation” group “26 Mechatronics, energy and electrical occupations”

By reason of the employment, work and technology change and because of the interaction between “work occupations” and “training occupations” it is clear that also e.g. the “occupational standards” on work qualification level 2 and the “training occupations” on VET qualification level 3 and 4 must normally change at the same time. But this is in practice not possible why in Germany the “training occupations” change depending on the occupation sometimes in six or in ten or in twenty years. In average the “training occupations” change nearby every ten years. Figure 8 shows for example the innovation and development process of the “training occupation” group “26 Mechatronics, energy and electrical occupations” starting around the year 1900. Each red small box represents basically an “occupational standard” and a state recognised “training occupation”. We start in Germany to develop such state recognised “training occupations” to the “training occupation” group “26” nearby 1920/1930. And as figure 8 show we had since that day and until today more or less five big innovation phases with groups or singles of new reformed “occupational standards” and state recognised “training occupations” mostly based of also phases of technology and work organization change.

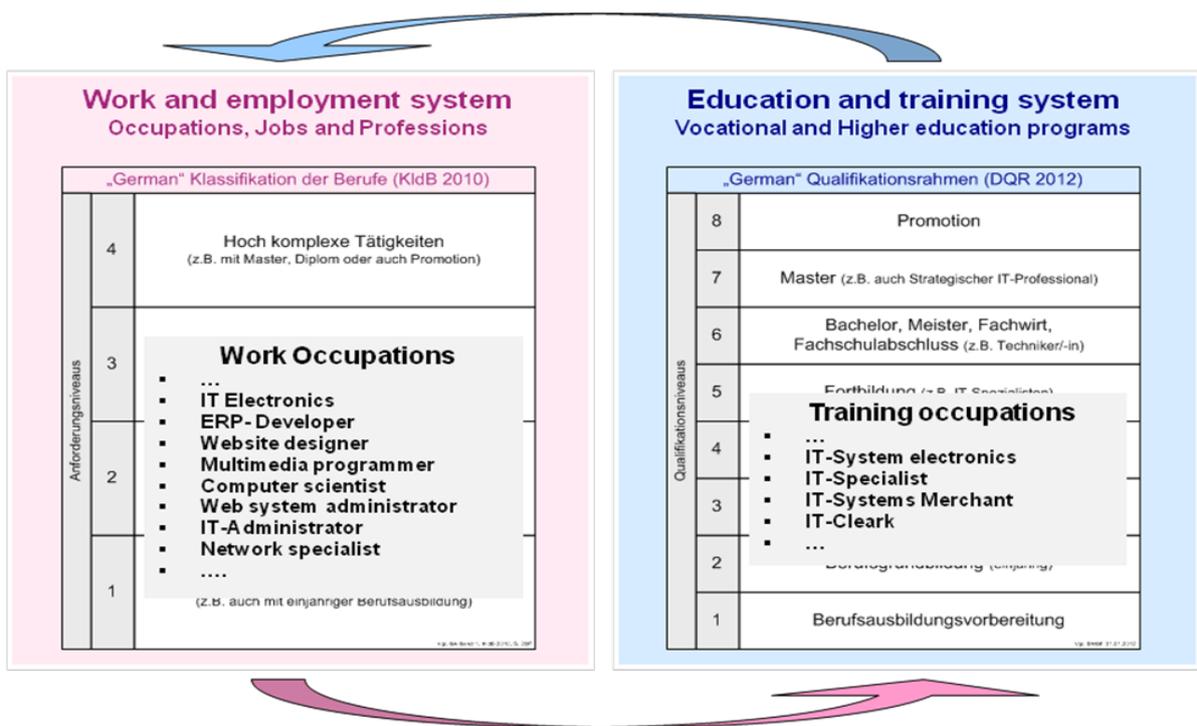


Figure 9 Examples of work and training occupations

One other example show figure 9 with the development of four new Information and Telecommunication (IT) “occupational standards” and state recognised IT “training occupations”. Because the IT world change rapidly and the companies created many new IT jobs and work occupations (see figure 9 left side) Germany needed and developed in 1997 for these new jobs on skill or work qualification level 2 four new IT “occupational standards” and “training occupations” (see figure 9 right side).

Based on the experience of the past we create and developed at this time in Germany for the new “occupational standards” and “training occupations” in general a new didactical approach for the design and the occupational profiles. The mostly subject and technology oriented occupational profiles should be changed to more business and work process oriented occupational profiles. Therefore the description of the duties and tasks of all the profiles of the new “occupational standards” and “training occupations” at this time show in general a more or less good business and work process orientation.

In combination of these changes and the development and introduction of the above mentioned “European Qualification Framework” (EQF-2008) and “German qualification framework” (DQR-2013) the didactical and curricular approach of all new “occupational standards” and “training occupations” change further and again in the direction “competence or qualification based” and “outcome orientation”. The core innovation of this change is at first and if we follow the ISCED and European model that we for all the training or study qualifications we have to use the three descriptors “knowledge, skills and competencies” (see figure 10 right side). In Germany we use these descriptors especially for all the “training occupations” on level 3 and 4.⁷

⁷ Comp. BBiG 2005

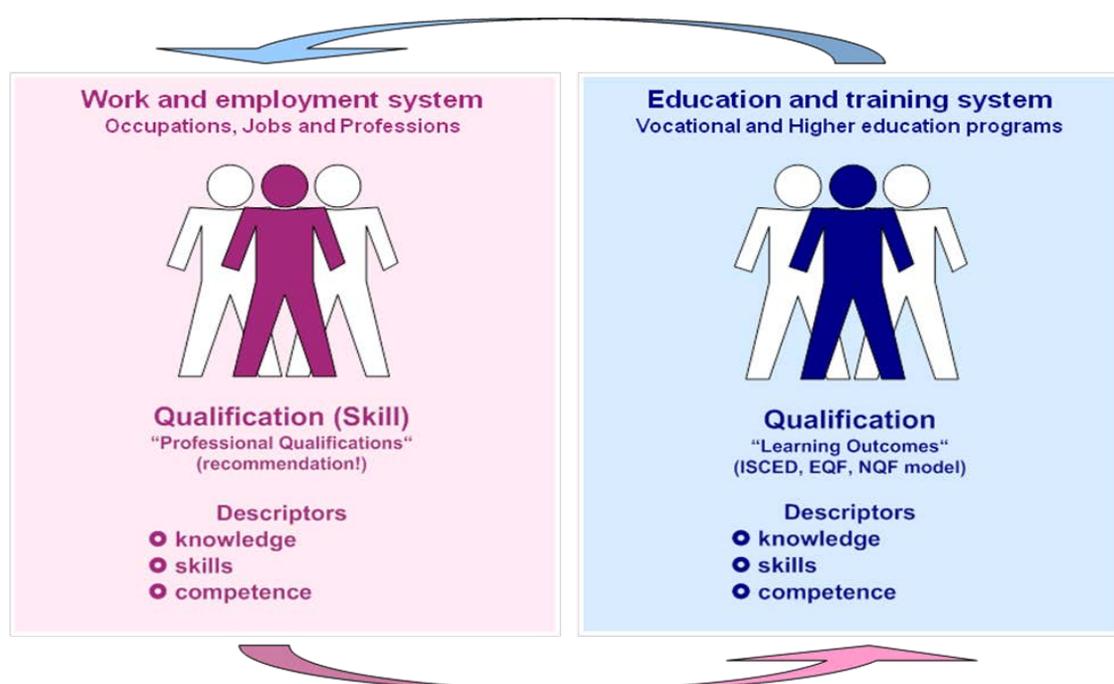


Figure 10 Definition and use of one model with three descriptors for work and training qualifications⁸

The continuous use of the three descriptors “knowledge, skills and competencies” for learning outcomes is not only a big advantage for international comparisons and recognitions. If there is a profound knowledge of proven “knowledge, skills and competencies” e.g. a certificated industrial electrician has achieved, we can also estimate for which job or work occupation this industrial electrician is well qualified. But an important precondition is here that the skill needs or work qualifications within the labour market must be described with the same three descriptors “knowledge, skills and competencies” as the “training or study qualifications” (see figure 10 left side). And if we use for both sides and systems the same three descriptors for work and training qualifications of course this is in general also a big advantage to define and describe new “occupational standards” and “training occupations”. But this is just now only a strong recommendation for the future because until today e.g. the classifications of occupations⁹ normally used other and mixed skill or qualifications models and descriptions.

On these basics the following chapters will show and explain how are the important practical steps and experience in Germany to develop integrated occupational standards and education and training programs as also standards.

⁸ Recommendation on INAP conference. Petersen 2013

⁹ For example: A job is defined in ISCO-08 as „a set of tasks and duties performed, or meant to be performed, by one person, including for an employer or in self-employment“ (ISCO-08 Volume 1, S.11).

3 Definition of occupational, educational and qualification standards

Considering different educational systems the usage of terms often differs in literature. This is based on the individual characteristics of different educational systems. In order to avoid misunderstanding it is necessary to explain how different terms are used within this report.

According to the definition of the European Commission "*qualification* means a formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to a given standard" (European Parliament 2008, 4) Qualifications are expressed in formal documents like diplomas, certificate or awards. These are based on norms and specification regulating its award. These norms constitute the qualification standards (Cedefop - European Centre for the Development of Vocational Training 2009)

- (a) Occupational standards describe the employment requirements, "the main jobs that people do" describing the professional tasks and activities as well as the competences typical of an occupation
- (b) Education standards may define the expected outcomes of the learning process, leading to the award of a qualification, the study programme in terms of content, learning objectives and timetable, as well as teaching methods and learning settings, such as in-company or school-based learning. Educational standards answer the question 'What does the student need to learn to be effective in employment?'
- (c) Assessment standards may specify the object of assessment, performance criteria, assessment methods, and the composition of the jury entitled to award the qualification. Assessment standards answer the question 'How will we know what the student has learned and is able to do in employment?' (Cedefop - European Centre for the Development of Vocational Training 2009)

The definition and usages of occupational standard differs within Europe (ibid). In Germany traditionally no separated occupational standards exists. Although the recently developed occupational classification (KldB2010) could be interpreted as occupational standards, they are not used for educational purposes till now. The common usage of occupational standards is closely linked to training occupations. Within the system of initial vocational education (dual system), occupational standards are combined with educational and assessment standards. Occupational standards fulfil the same function as defined in (a) but are not developed separately; they are part of an integrated process within the development of educational and assessment standards. This process and the legal framework are describes in the following chapters.

4 Legal framework „Vocational training act“(BBiG)

Legal frameworks for education and training have a long tradition. The legal relationship between a master and his trainee was always organized by means of a training contract. The historical roots of vocational training in enterprises can already be found in the Middle Age. Former guilds, the crafts associations, regulated the training for their enterprises. The so called master craftsmen training was developed out of these activities and later adopted by the industry in the beginning of the 20th century. Guidelines for the duration of training and catalogues of mandatory skills and knowledge built the first uniform standards in order to remove differences resulting from different regions and different size of companies (Bundesinstitut für Berufsbildung (BIBB) 2013b). Other industrialized countries had the same history in crafts training but they did not carry out this transition.

Before the Vocational Training Act (BBiG) was enacted in 1969 the legal relationship of VET was part of other laws (Arnold/Lipsmeier/Ott 1998). The BBiG was established first in 1969 and last amended in 2005. It is the first national wide law regulating a uniform standard for vocational education and training. The enactment of that law succeeded after long debate under the Grand Coalition of Christian Democrats and Social Democrats. The fundamental principle of BBiG is the cooperation of employers, trade unions and public authorities in promoting vocational qualification.

The BBiG was amended in 2005. Among other little changes the concept of “skills and knowledge” was extended by “capabilities” to fulfil comprehensive vocational competence. The importance of international experience is stressed by the possibility to complete the initial training also in parts abroad. (Federal Ministry of Education and Research 23.03.2005)

4.1 Key Issues of BBiG

In this chapter the focus is made on the key legal aspects regarding initial VET. The main aspects in BBiG covered are:

Parts	Details
General Provisions	<ul style="list-style-type: none"> • Vocational training preparation • Initial vocational training • Further vocational training • Retraining • Learning locations
Organization of Initial Training;	<ul style="list-style-type: none"> • Recognition of Training Occupations • Training relationship, contracts, obligations, allowance • Beginning and end of VET • Register of VET relationships
Suitability of Training Premises and Training Staff	<ul style="list-style-type: none"> • Personal and technical qualifications, supervision of suitability

Examinations	<ul style="list-style-type: none"> • Final examination, objects, rules • Board of Examiners • Admission to interim and final examination • Examination rules • Equivalence of Examination Certificates
Organization of VET	<ul style="list-style-type: none"> • Competent Bodies • Supervision of VET
VET Research, Planning and Statistics	<ul style="list-style-type: none"> • Report on VET, Surveys
Federal Institute for VET	<ul style="list-style-type: none"> • Tasks, Organ, Boards, Funding, Budget

Figure 11 Main parts of BBiG ¹⁰(Federal Ministry of Education and Research 23.03.2005)

From initial VET it is expected to qualify in a broad range of activities.

(3) Initial training shall, through a systematic training programme, impart the vocational skills, knowledge and qualifications (vocational competence) necessary to engage in a form of skilled occupational activity in a changing working world. Initial training shall also enable trainees to acquire the necessary occupational experience. (Federal Ministry of Education and Research 23.03.2005)

Section 2 defines the learning locations of vocational training which are “*companies engaged in economic activity, in comparable institutions not engaged in economic activity, especially those of the public service, in establishments of members of the independent professions, and in households (in-company training)*” (Federal Ministry of Education and Research 23.03.2005)

Part time vocational schools constitute the second learning location. This matter shaped the expression “Dual System”.

Beside this traditional principle full-time vocational schools prepare students for specific occupations e.g. in health and welfare, commerce, design etc. These schools are generally regulated by the Länder due to the federal law. The schools final examination may be given parity with the examination within the dual system (Hippach-Schneider/Hensen/Schober 2013). Note, that this report focuses the “Dual System”.

The BBiG is a national law, the Federal Ministry of Economics and Labor officially recognizes a “training occupation” and issues an initial “training regulation”. This is obligatory for in-company training in whole Germany.

Due to the Basic Law the Federal Republic of Germany is a democratic and social federal state. It comprises 16 *Länder* (countries) which are fundamentally responsible for education and culture (‘cultural sovereignty’ of the *Länder*). While the Federal Government is responsible for the in-company training regulation, the curriculum for the vocational school is in behalf of the *Länder* Government. In order to meet a decent level of comparability between the *Länder*, the Standing Conference of Ministers for Education and Cultural Affairs (KMK) of the *Länder* was established. This board meets three to four times a year. In praxis the part time vocational school

¹⁰ The complete English translation of BBiG can be downloaded from:
http://www.bmbf.de/pubRD/BBiG_englisch_050805.pdf

curricular is agreed within the coordination process. It is distributed into the *Länder* without notably differences and hence similar all over Germany.

(3) *Young people under the age of 18 may not receive initial training in occupations other than recognized training occupations unless such initial training prepares them for advanced qualification pathways.* (Federal Ministry of Education and Research 23.03.2005, 5)

In addition to this principle of exclusively there is no formal school leaving qualification required in order to access the dual system apprenticeship. The initial vocational training in Germany is open for everyone although the majority of trainees hold either the intermediate certificate or the *Abitur*¹¹ (Hippach-Schneider/Hensen/Schober 2013). In 2012 the level of general school leaving certificate was distributed in 42.1% intermediate certificate, 31.9% secondary education and 23.1% general qualification for university (Bundesinstitut für Berufsbildung (BIBB) 2013a, 10). Young people sign a vocational training contract with an enterprise providing the training according the training regulation binding a quality standard.

In good praxis the companies offering apprenticeship training positions, expect a certain school leaving qualification. It's getting more and more common that young people, most of them aged between 16 and 18 perform a short term placement in the desired company. The benefit of getting to know each other is often more relevant than formal qualifications. A lot of school programs exist to foster this.

The permeability between the different systems of VET preparation initial VET and further training and retraining is covered also by this law. In general the crediting of previous gained qualification is arranged. For example it is possible to credit a previous VET preparation period fully or in parts towards an initial vocational training (Federal Ministry of Education and Research 23.03.2005) Section 7. In Praxis especially the permeability between vocational education and academic studies is under discussion. On one hand within VET there exists a variety of possibilities to gain formal qualification required to enter a study program (KMK Sekretariat der Ständigen Konferenz der Kultusminister der Länder in der Bundesrepublik Deutschland 2009b). Many different further education programs for example master of crafts, directly gain a study admission (KMK Sekretariat der Ständigen Konferenz der Kultusminister der Länder in der Bundesrepublik Deutschland 2009a). On the other hand the credit of occupational related competences towards a study program is limited. Although this possibility is given it depends finally on the respective university to approve the equality towards the study program. The verification is done individually (KMK Sekretariat der Ständigen Konferenz der Kultusminister der Länder in der Bundesrepublik Deutschland 2008). The relevance regarding recognition of prior learning is focused especially in the Bologna process “European Higher Education Area”. Due to the establishment of the European qualification framework (EQF) and the German adaption (GQF) the transparency of qualification has been increased. The goal is to foster not only the permeability between different systems but also the mobility of learners and employees within Europe (Arbeitskreis Deutscher Qualifikationsrahmen).

¹¹ Abitur is the diploma from German secondary schools qualifying for university admission.

4.2 Definition of „Ausbildungsberuf“–training occupation

The German term „Ausbildungsberuf“ (training occupation) has to be defined and delimited towards the term occupational standard (compare chapter 3). The “Ausbildungsberuf” is a construct. It comprises within its regulations employment characteristics beside a training and qualification framework. It has to be clearly pointed out that in Germany there don't exist separate occupational standards. The employment characteristics within the training regulation can be interpreted as “occupational standard”. But this is an integrated part of the vocational education and training standard and only developed during this process later described.

The training occupation in behalf of the Federal government is a “state recognised training occupation”. So this type of occupation exists only in the sphere of education and training. It prepares young people to successfully manage qualified occupational activities in the labour market. Unfortunately the term “Beruf” (occupation) is also used as an equivalent designation for training occupation. Others define “Beruf” in the context of job title or occupation in the labour market. This leads to confusion. In general a person who is being qualified in a certain training occupation can enter the labour market in different jobs or occupations (compare chapter 1).

One key difference to other education philosophies is the expectation of a full vocation capacity from a person who has finished the training. Usually a person certified after the training period is capable to immediately start a qualified work. Training on the job periods, which are common for academic occupations are usually not needed. This advantage is a result of the “dual system” method, providing continuous in company training. In comparison, the school based vocational education programs don't have this strong company binding. They need to gain work experience within the school campus. In praxis these programs suffer under acceptance on the labour market. After completion many students enter another vocational training at a company.

The BIBB (Federal Institute for Vocational Education and Training) summarizes the following criteria for recognition and retention of training occupations:

- *Sufficient qualification needs, which are company independent and unlimited.*
- *Training for a qualified, having sole responsibility in performing tasks in broad range of activities.*
- *Permanent, age independent occupational tasks with broad basic education*
- *Possibility for a structured training framework*
- *Sufficient differentiation from other training occupations*
- *Training period between two and three years*
- *Foundation for further education and career advancement*
- *Acquisition of competence to act independently in the application of skills and knowledge*

(Bundesausschuss für Berufsbildung 25. Oktober 1974)

4.3 The „Dual System“

The vocational education in Germany provides all young people an opportunity to enter a skilled employment and to take responsibility for their own lives. The term “Dual System” represents the key principle of vocational training and education which is shared by primary two partners, companies and vocational schools. This way of education mainly exists in the German spoken countries Austria, Switzerland and Germany. Despite the trend to more academic education, still 60% of school leavers started an initial vocational training in 2012(Bundesinstitut für Berufsbildung (BIBB) 2013a, 82).

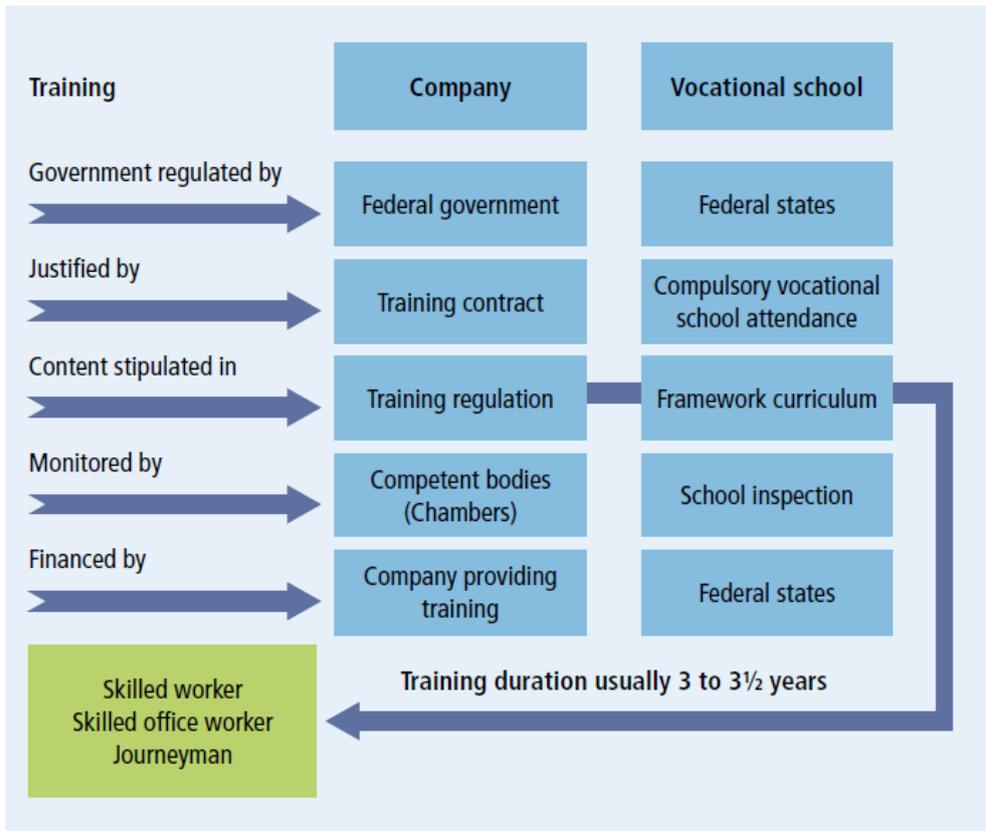


Figure 12 Duality of initial VET (Bundesinstitut für Berufsbildung (BIBB) 2013b)

The duality is spread over the whole process of VET (Figure 12). The training regulations, enacted by the federal government regularises the in company training. In addition the federal states are responsible for the respective school curricular. Their content of both is aligned during the development process later described in this report. In praxis the school curricular closely follow the content of the training regulations which content is derived from business and work processes. Both curricular, the school-based and company-based, constitute the educational standard. Since 1997 VET school curricular are structured in so-called learning fields. The didactic approach behind learning fields is the concentration on occupational tasks. They follow business and work processes as the training regulation it does (KMK Sekretariat der Ständigen Konferenz der Kultusminister der Länder in der Bundesrepublik Deutschland 2011).

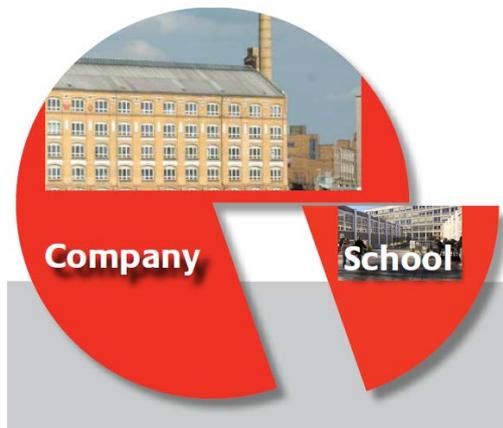


Figure 13 Dual System principle (Federal Ministry of Education and Research 2011)

This perspective is different to traditional subject oriented curricular approaches. Looking at the historical development of vocational school curricular many different didactical and methodological approaches can be seen. The variety of concepts includes autonomous curricular, different forms of parallel/synchronized curricular. The didactic methodological matching of both curricular is a continuous challenge (Petersen 2002).

As an example the traditional school organization in subjects has led to a scientific theory based way of study, following practical examples. In the past the vocational didactic was more a technology based respective scientific didactic (Petersen 2005, 165). Students build knowledge of complex technology theories but this was not relevant for their daily occupational requirements.

Within learning fields occupational tasks built the starting points and the relevant theory, methods etc. is linked accordingly. The overall objective of vocational school is that students gain full vocational competence by combining professional and social expertise (KMK Sekretariat der Ständigen Konferenz der Kultusminister der Länder in der Bundesrepublik Deutschland 2011).

Lessons learnt

The implementation of curricula structured in learning fields came along with difficulties. Vocational teaching staff complains about the wide and not detailed defined curricular. Reasons might be related to implementation process were teachers not have been prepared towards this didactical approach. Additional organisational changes haven't been implemented but are necessary. Examples of good practice are teaching team organisations and strong cooperation with enterprises. One big challenge is still the need of continuous competence development of teaching staff. Teachers need to know which working processes are present in the enterprises in order to develop work oriented learning tasks. They need time and possibilities to gain this experience. Different good practice examples exist, but often they rely on personal engagement of a limited group of teaching personal.

Existing quality monitoring instruments focus either the education in companies or at the schools. Whether a company has a “training competence” has to be verified with the competent bodies. The term competent body refers to different associations of enterprises i.e. chambers. These are Chambers of Industry and Commerce, Chambers of Crafts and Trades, Chambers of

Agriculture, and chambers of the liberal professions, such as Medical Chambers¹². The role of the chambers is described in more detail in chapter 7.1.

The shared funding reflects another duality of the initial VET. Federal states finance the vocational teaching staff; the schools are funded by the local authorities. It is remarkable that only 21% of all enterprises offer in company VET although up to 90% of the companies are authorized to do that (Bundesministerium für Bildung und Forschung 2014). Most of them are medium and large enterprises.

It is faced as an ongoing problem that the number of companies offering education and training is decreasing. Various political efforts are made to increase the number of offered traineeships even this is a private matter. In 2004, 2010 and 2014 the Federal Government, together with the central associations of the private sector, agreed on the “National Pact for Career Training and Skilled Manpower Development in Germany,” which provides more in-company training as well as additional efforts from the public sector (Allianz für Aus- und Weiterbildung 2010). A general training levy is since the 1970th under controversy discussion but was not implemented yet.

Although the number of students starting an academic education is increasing, the German economy is strongly dependent on qualified workers generated by initial VET. Initial VET competes with academic study programs. In the same time the need for broadly skilled labour raised. With regard to this tendency the federal government will put political focus on strengthening the integration of dual VET, modernizing, quality improvement, equality and permeability Stärkung der Integrationskraft der (Bundesministerium für Bildung und Forschung 2014, 5).

Apart of these reforms the general success of this way of vocational education is still based on the following core principles (Die Bundesregierung der Bundesrepublik Deutschland 05. 07. 2013):

- Cooperation between social partners, employers and government
- Learning within the working process
- Acceptance of national occupational standards
- Qualified instructors
- Institutionalized occupational research and advisory service

4.4 Training regulations

The federal government dictates the legal framework of initial vocational education and training through Training regulations. These laws are enacted by the Ministry of economy. They set the objectives, duration, content and examination requirements for each training occupation (see Figure 14). In general initial VET has a duration of 2 to 3,5 years. The duration depends on the

¹² All companies in a particular sector are compulsory, dues-paying members of the relevant Chamber. Decisions are made by a General Assembly elected by all members of the Chamber. The Chambers are subject to legal supervision by a higher authority of the federal states Bundesinstitut für Berufsbildung (BIBB) (2013b).

training occupation. Most of the training last 3 years. Depending on the individual preconditions of trainees this time can be shortened. E.g. an excellent performing trainee could apply to pre-draw the final examination.

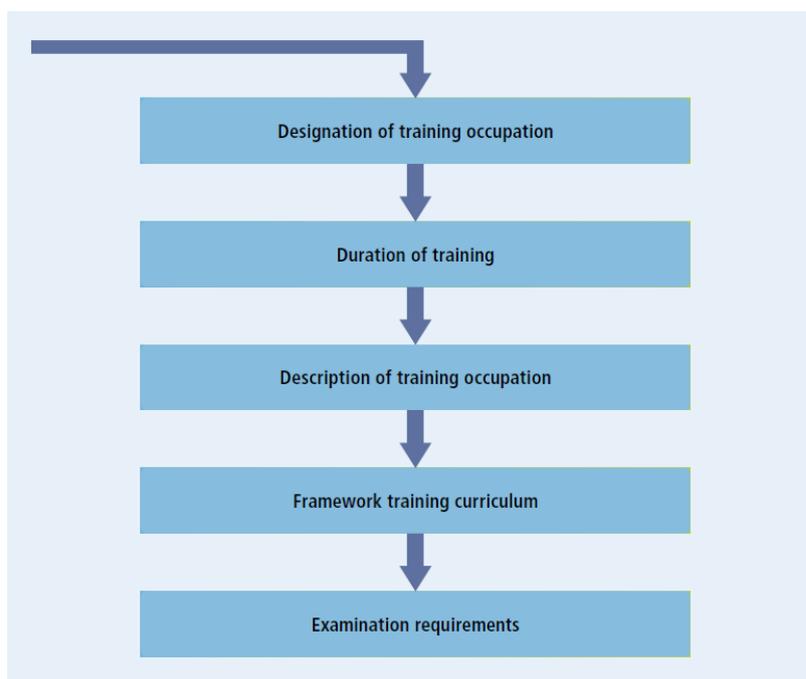


Figure 14 Main topics to be covered in a training regulation (Bundesinstitut für Berufsbildung (BIBB) 2013b)

The process how these regulations are developed is described in a later chapter of this report. Training regulations are only relevant for the work-based in company training. The school-based curricular is connected to them but issued separately. Training regulations are so to speak one part of the educational standards following the logic of progressive accumulation of knowledge skills and competences. In general only the minimum required aspects are listed in the training plan. Beside the designation of a training occupation the duration is specified between two to three and a half years.

4.4.1 The professional profile – occupational standard

The description of the professional profile (Berufsbild) within the training regulation can be interpreted as the actual “occupational standard”. The following table gives an example of the professional profile of a *Mechatronics Fitter*¹³ (The Federal Minister of Economics and Technology, translated Version by BIBB 2011):

- | |
|---|
| <ol style="list-style-type: none"> 1. Vocational education and training, employment and collective wage agreement law 2. Structure and organisation of the company providing training 3. Health and safety at work 4. Environmental protection 5. Company and technical communication 6. Plan and control work processes, check and evaluate work results 7. Quality management 8. Check, mark off and label workpieces |
|---|

¹³ The complete translated english version of the training regulation can be downloaded under: http://www.bibb.de/dokumente/pdf/5_govet_mechatroniker_ausbildungsrahmenplan_en.pdf

9. Cut, separate and reform manually or by machine
10. Join
11. Install electrical sub-assemblies and components
12. Measure and test electrical values
13. Install and test hardware and software components
14. Build and test control systems
15. Programme mechatronic systems
16. Assemble sub-assemblies and components into machines and systems
17. Assemble and dismantle machinery, systems and plants; transport and secure
18. Test and adjust the functioning of mechatronic systems
19. Commission and operate mechatronic systems
20. Maintain mechatronic systems

Figure 15 Training Profile of Mechatronics Fitter

More detailed employability skills, knowledge and competences for each topic of the professional profile are listed in the general training plan.

Federal Law Gazette 2011 Part I No. 39, published in Bonn on 29 July 2011

No.	Part of the training occupation profile	Skills, knowledge and competences to be imparted	Guidance times in weeks in the training year		
			1	2	3/4
5	Company and technical communication (§ 3 Paragraph 2 No. 5)	a) Procure and evaluate information b) Conduct discussions with line managers, colleagues and within the team in a manner appropriate to the situation, present facts and circumstances, use technical terminology in German and English c) Use opportunities to resolve conflicts d) Handle IT systems, in particular deploy software and connect and use peripheral devices e) Protect and secure data f) Prepare protocols and reports, use standard software	4*		
		g) Read and use partial, group and overall drawings h) Read and use circuit documentation on sub-assemblies and devices used in <u>fluidics</u> i) Read and use electrical, block, function, assembly and connection plans j) Prepare sketches and lists of parts	3*		
		k) Update technical plans of sub-assemblies, machines and plants l) Use technical regulations, operating instructions, work directives and other information including in English		3*	
		m) Use presentation techniques n) Explain products and work results on handover and provide initial instructions as to function o) Use company information and communication systems			3*

Figure 16 Extract of the detailed training plan of Mechatronics Fitter

The duration and mapping the training parts according the training year has to be seen as a guide. In practice this strongly depends on the company possibilities and varies. Usually an enterprise creates an internal framework for each trainee in accordance with the enterprise needs and possibilities. Note the designation of skills, knowledge and competences described in Figure 16. The latest recommendation of BIBB main board (Federal Institute of Vocational Education and Training) defines new guidelines to structure and describe the professional profile hence occupa-

tion standard. Because of the establishment of GQF (German Qualification Framework) there is a shift towards a competence based description of the professional profile (Hauptausschuss des Bundesinstituts für Berufsbildung 2014).

Level 4			
Be in possession of competences for the autonomous planning and processing of technical tasks assigned within a comprehensive field of study or field of occupational activity subject to change.			
Professional competence		Personal competence	
Knowledge	Skills	Social competence	Autonomy
Be in possession of deeper general knowledge or theoretical professional knowledge within a field of study or field of occupational activity.	Be in possession of a broad spectrum of cognitive and practical skills which facilitate autonomous preparation of tasks and problem solving and the evaluation of work results and processes according consideration to alternative courses of action and reciprocal effects with neighbouring areas. Provide transfers of methods and solutions.	Help shape the work within a group and the learning or working environment of such a group and offer ongoing support. Justify processes and results. Provide comprehensive communication on facts and circumstances.	Set own learning and work objectives, reflect on and assess such objectives and take responsibility for them.

Figure 17 GQF Matrix (German Qualification Framework Working Group 2011)

The descriptors of competences will follow the descriptors of GQF level 3 and 4, see Figure 17. Unfortunately the competence model used in GQF does not correspond to the European qualification framework. The descriptors in the GQF are more detailed and in praxis difficult to define hence to distinguish.

A practical recommendation out of this experience is to agree on a clear and simple qualification model. The European model of knowledge skills and competences could be a useful reference. The description of the occupational standard has to be clear and understandable. Note that the training regulation document has to guide the enterprise staff to perform the training. They need to be able to understand the topics to be covered in education. Note that the description of an occupational profile does not contain explicit designations of technologies and products. These usually not last very long and would require an update of the regulation in case of change. Further the description is neither too detailed no too abstract.

4.4.2 Examination

The rules about examination constitute another part of the training regulation. The objective of examination is to ascertain whether candidates have acquired occupational employability skills (The Federal Minister of Economics and Technology, translated Version by BIBB 2011). One innovation since 2003 is the split of final examination in two parts which are held at separate times. Part 1 of the final examination has to take place before the end of the second year of training; Part 2 is carried out at the end of the training period (ibid §6). Both parts need to be passed to gain the qualification.

In order to gain an overall valid, reliable and objective result of the examination part 2 is further split in different examination areas. As an example the overall weighting of the mechatronics fitter examination is constituted as follows (ibid):

1. Working on a mechatronic sub-system 40 percent
2. Work order 30 percent
3. Work planning 12 percent
4. Function analysis 12 percent
5. Business and social studies 6 percent

Note that the grade gained during the intermediate examination is part of the final grade. The “Work order” comprises a comprehensive practical examination. The candidate

should execute a company order within 20 hours including provision of practical documentation and to take part in an order-related specialist oral examination of no more than 30 minutes’ duration; the specialist oral examination should be conducted on the basis of the practically related documentation of the company order processed; the order-related specialist oral examination should act as a vehicle for evaluating relevant process skills with regard to the execution of the order under due consideration of the practically related documentation; (ibid §7)

Part 3 to 5 of the final examination are written exams.

4.5 Different structures of training occupations

The total amount of training regulations varies around the number of 350. Basically for each training occupation one training regulation exists.

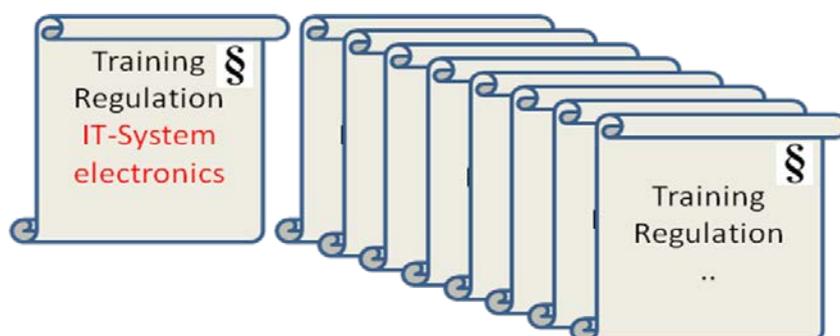


Figure 18 Training regulations form the legal framework for each training occupation

The BIBB issues a directory of all valid training regulations (Bundesministerium der Justiz, Bundesinstitut für Berufsbildung 22.05.2013).

Lessons learnt

Enterprises tend to demand training occupations which suits only to their specific needs. Usually they are not interested in education of skills they not get any benefit out of. From their prospective a narrow training in order to satisfy the specific needs would be sufficient. This short term view contradicts the demand of flexible, sustainable human capital. A person trained in this way would only gain a limited opportunity on the labour market. Beside this the vocational schools as the other part in the dual system would not be able to organize teaching for so many different narrow requirements.

The question about the amount of training regulations necessary and structure of them is an ongoing issue.

In order to overcome this problem to satisfy the individual company needs on hand and the broad perspective of limited amount of training occupation on the other hand, different structures of training occupations have been evolved over the time.



Figure 19 Training occupation structure (Federal Ministry of Education and Research 2011)

Historically the uniform structure was dominant, over time new structures with specializations or different options evolved. Uniform structure means that the training occupation is uniform without any specialization. The majority of training occupations, 261 in 2012 were structured in this way (Bundesinstitut für Berufsbildung (BIBB) 2013a). 24% of training occupations are structured according to specializations see Figure 19. This possibility can satisfy the special demands of different sectors while the majority of the occupational standard is equal. For example the clerk for whole sale trade and foreign trade is one training occupation with two specializations, foreign trade and whole sale. These occupational profiles comprise a lot of common qualifications. Within the training regulation the special part for each training specialization is listed. Particular characteristics of enterprises even in one sector can also be managed by this instrument. “Salesperson specializing in foodstuffs” is one example. Bakery, butchers shop and confectionery are different specializations in this domain.

The possibility to choose different options within one training occupation has arisen since year 2000. It is an even more flexible way to customize the occupational shapes in enterprises (see Figure 19). In 2012 only 25 training occupations have been structured according to this model (Bundesinstitut für Berufsbildung (BIBB) 2013a). Another trend is that the degree of detailed definitions is reduced within the regulations. This opens more space for companies to adopt their individual conditions (Arnold/Lipsmeier/Ott 1998)p. 50.

In summary this means that all of these different structures of training occupations offer flexible ways to adopt the specific company needs to a limited amount of training regulations. This is mandatory in order to realize a respective vocational education at the part time schools. It is remarkable if all available specializations and options separately counted the total number of training occupations would be around 900 (Bundesinstitut für Berufsbildung (BIBB)).

5 Development of occupational standards- training regulations

The German approach to develop and use of occupational standards differs from other countries. An occupational standard is part of the training regulation, the legal framework for training occupations.

As a basic role the initiative to constitute a new or modernized training occupation comes from industry/enterprise associations or from trade unions. The Federal Institute of Vocational Education and Training (BIBB) acts as a development centre and platform for the social partner's dialogue. According to the principle of subsidiarity unions and employer associations are responsible to shape the world of working hence vocational education. The state has only a support function. The negotiation of all involved partners follows the principle of consensus. Employers and unions need to find stable compromises in order to secure the sustainable acceptance of VET.

5.1 The Federal Institute for VET - BIBB

The Federal Institute for Vocational Education and Training was established in 1970 on the basis of the Vocational Training Act of 1969 as an institute for researching, developing and promoting out-of-school vocational education and training. It belongs to the federal ministry of education and research which has the overall responsibility for vocational training.

The BIBB's main task is "to take part in the drafting of initial training regulations and other ordinances to be issued under this Act"(Federal Ministry of Education and Research 23.03.2005)Section 90 (3).

Further tasks of the BIBB are:

- Conduct VET research by means of scientific research,
- helps to prepare the annual Report on Vocational Education and Training,¹⁴
- helps to compile VET statistics issued by the Federal Statistical Office,
- promote pilot schemes, including scientific monitoring and evaluations,
- takes part in international cooperation in the field of VET,
- assumes on behalf of the federal government additional administrative tasks aimed at advancing VET,
- maintain and publish the register of recognised training regulations,

¹⁴ This report is issued by issued by the Federal Ministry of Education and Research. The English translated version from 2014 can be downloaded under:

http://www.bmbf.de/pub/Report_on_Vocational_Education_and_Training_2014_bf.pdf

- carry out the tasks described in the Distance Learning Protection Act to contribute to the improvement and extension of vocational distance learning through the promotion of development projects. (Federal Ministry of Education and Research 23.03.2005)

One main part of the BIBB activities is related to skill forecasts. Different projects also in coordination with the Institute for Employment and research (IAB) are carried out (Maier 17.02.2011).

Some main objectives are:

Objectives:

- Identify possible medium-term to long-term developments (up to 2025)
- Identify potential future problem areas in accordance with qualifications and occupations (*new*)
- Provide a balance of supply and demand (*new*)
- Provision of a basic model with uniform:
 - data foundations
 - classifications
- Deeper level of disaggregation than in previous comparable studies
- A well-founded empirical basis and transparency (providing an impetus for further statistical developments)

Figure 20 Methods and Results of skills demand and supply forecasting - the case of Germany (Maier 17.02.2011)

The involvement of all social partners is also at the BIBB present. Its board consists of eight employer representatives, eight trade union representatives, eight *Länder* (federal states) representatives and five representatives of the federal government. Among other the board shall advice the the Federal Government on basic issues regarding VET and may submit an opinion on the draft report on VET (ibid, section 92).

5.2 Objective, approach and method

The feedback mechanism between labour market and VET can be modelled in basically four different ways (Cedefop - European Centre for the Development of Vocational Training). The German approach follows the “coordinated model” which describes the mediation of the government within the interaction of VET and labour market. Beside this model Cedefop has identified liberal, statist and participatory forms of interaction (ibid).

The development procedure for training regulations follows a strictly organized path. The following illustration (Figure 21) points out the main aspects.

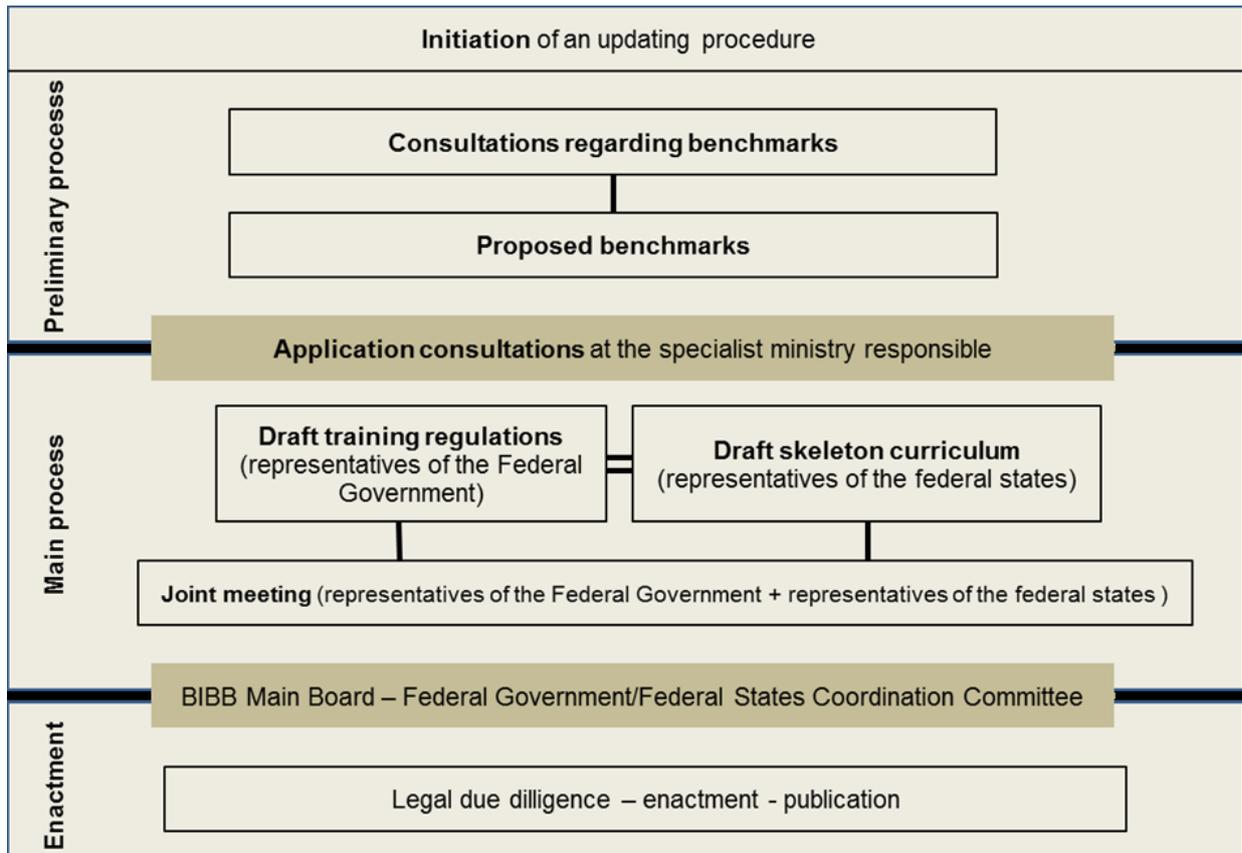


Figure 21 Development procedure of training regulations (Hippach-Schneider/Hensen/Schober 2013) Barbara Lorig et. al. In: bwp, Ausgabe Nr. 20, Juni 2011. Unter: http://www.bwpat.de/ausgabe20/lorig_etal_bwpat20.pdf,

The main motivation and initiative to update or develop new training regulations comes from the social partners. They basically know the requirements on the labour market. The first steps are consultations regarding basic benchmarks which are proposed within the preliminary process. Involving employers' associations and trade unions at this stage utilizes the expertise of day-to-day VET practitioners and ensures the broad acceptance. This intensive cooperation characterises the whole process. The process is already conducted by the BIBB during this stage. The BIBB contributes with respective occupational field research. The research activities in different occupational fields are an ongoing process. After the proposed benchmarks an official application is sent towards the relevant ministry. This depends on the relevant occupational field. For example the Ministry of economics is responsible for all industry related occupations; the Ministry for agriculture is concerned with the respective agriculture occupations. They authorize the following main process (see Figure 21). This process alternates between development and matching phases. On one side the training regulation is developed by nominated company union experts in working groups. Parallel experts of the KMK (standing conference of the Ministers for Education and Cultural Affairs) develop the respective VET school curriculum. Joint meetings of both sides secures a matching and consensus principle. Finally legal due diligence checks are made and the training regulation is lastly enacted by the respective Ministry. The corresponding school curricular is released by the federal states.

Lessons learnt

One big challenge is to define the occupational standard within the training regulation. In praxis the day-to-day experience of the company experts are valuable contributions. But on the other hand this forum sometimes is place to achieve political goals rather than objective educational needs. Conflicts between social partners can influence the overall result. Sauter claims that the roles of research activities become obsolete if the clarification of the facts are not of interest (Sauter 2006, 66).

Nevertheless the development of training occupations requires deep empirical knowledge of economic, organisational and social changes. Some methods how to acquire these are described in the following chapter.

6 Update of training regulations

In general the modernisation of occupational standards i.e. the training regulation takes place every 10 to 15 years (see Figure 22 and historical overview Figure 8).

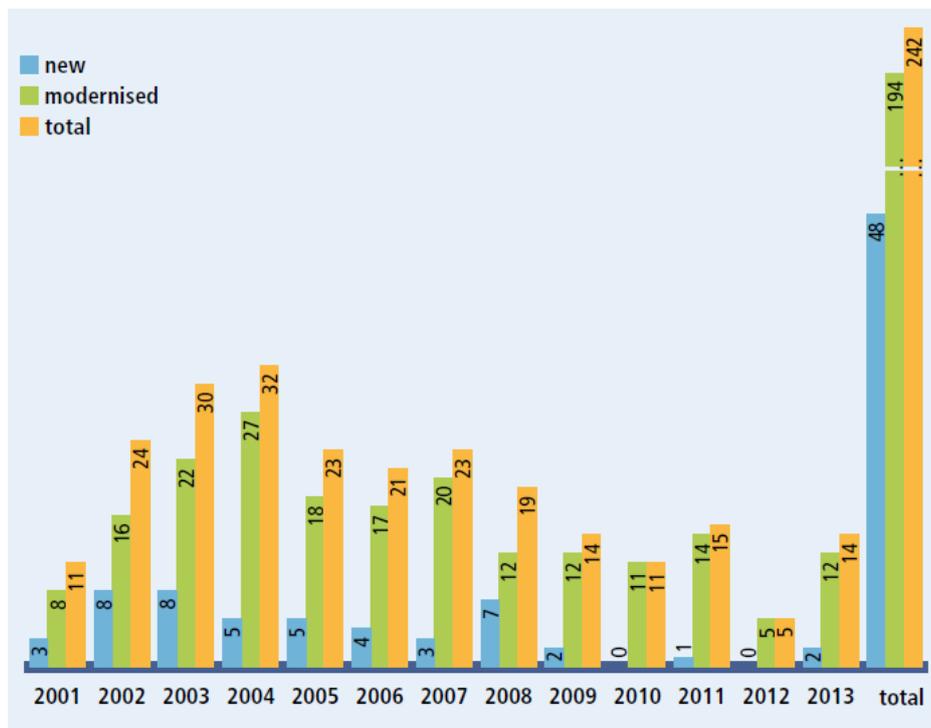


Figure 22 Updated occupational standards per year (Bundesinstitut für Berufsbildung (BIBB) 2013b)

Even if an existing training regulation becomes outdated the system itself compensates this to an extent. Especially the in company training part usually does not limit the education towards the profile requirements. If for instance new methods, technologies etc. arise the company will of course educate their trainee towards that needs.

The motivation for an update is again evolved by the social partners. They claim if for instance a new profile needs to be compiled or existing training regulations don't cover the actual labour market need. This is usually indicated by a decreasing number of trainees in that profile.

The procedure to update a training regulation follows the same principle as described in chapter 5.2. In the following section practical aspects of the BIBB research activities prior a modernisation of a training regulation are described.

In the example the training regulation of the "air traffic management assistant" is revised. The training regulation used is from 1960. The social partners have issued "proposed benchmarks" for a new, revised regulation. There is especially interest if this training occupation can be combined with a second existing training occupation "Service employee in air traffic"

In the BIBB research project defined goals are (Kock, Anke, u.a. 2013):

- Scope of similar content of both training regulations

- Crediting possibilities between both training profiles in case of shift during the education phase
- Scope of differentiation between both training regulations
- Intersections of both occupations in praxis
- Reasons for keeping both training regulations in parallel especially against the background of low trainee quantities
- Possibilities to shape occupational groups
- Modernisation requirements for “Service employee in air traffic“

In addition the following research questions investigate the existing training regulations (Seyfried, Brigitte, u.a. 2011)¹⁵:

I. Training regulation

- Are the designations of training occupations adequate? Which changes are necessary?
- Is the duration of the training adequate?
- Is the occupational standard relevant? Which changes are required?
- Are the qualifications regarding the level adequate?
- Is the time and content framework adequate?

II. Structure of educating companies

- Which type of companies provide training
- What are the criteria for elective qualifications?
- How are the training companies structured?
- How is the distribution between small trade, SME and large/industry enterprises?

III. Implementation of training regulation in praxis

- How is the implementation of the training regulation within the companies? Which changes are necessary?
- How qualified are the instructors within the companies
- What is the feedback of the owner of the company regarding vocational training?

IV. Assessment

...

V. Assessment results

...

VI. Vocational schools and school curricular

...

VII. Structure of trainees

...

VIII. Implementation of training regulation in company praxis

¹⁵ This example contains update project of “Automatenkaufmann”. The complete research program can be downloaded under:

https://www2.bibb.de/bibbtools/tools/fodb/data/documents/pdf/at_42373.pdf

- ...
- IX. Development of trainees quantities
- ...
- X. Implementation in view of the trainee
- ...
- XI. Ongoing demand of occupation on the labour market
- ...
- XII. Disposition of trainees after completion of education

Data Source

As data source the statistics are compiled of

- Report of VET (Federal Ministry of Education and Research 2014)
- Statistics of competent bodies

Method

As an addition to document analysis questioners, interviews are conducted on site/via telephone. The interviewed persons are instructors, qualified personal, competent bodies.

Lessons learnt

Considering various research activities the evaluation is focused on persons/institutions who are involved in education. This information is of course important but not sufficient. It is advised to observe the labour market i.e. the qualified workers in good practice. Good methodical procedure can be derived for example from Petersen and Wehmeyer case study within the EUQuaSIT Project “Case Studies on ICT Practitioner Work in ICT Business and Work Processes” (Petersen/Wehmeyer 2004).

A	>>	Overall information of the company and qualification structure of ICT practitioners
B	>>	Typical ICT business processes (projects, products, services, customer etc.) and organisational structure of the company
C	>>	Exemplary choice of one typical ICT business process of the company: Detailed investigation of a concrete example (project title and description, involved ICT practitioners, ICT work processes)
D	>>	Structure and content of each ICT work process: definition and description of the phases of activity and ICT work tasks and the cooperation and responsibility of involved ICT practitioners
E	>>	Detailed analysis of some exemplary ICT work tasks of all detected ICT work tasks of the work processes and phases of activity (especially relevant for the ICT practitioners with VET qualification at level 2-4!)

Figure 23 Methodology of case study to derive occupational standards (Petersen/Wehmeyer 2004)

Along with the short drafted method in Figure 23 the documentation of occupational requirements follows a model developed by Petersen (Petersen/Wehmeyer 2004)

ICT business process	Work processes	Phases of activity	Work tasks and skills	ICT practitioners (Job / Qualification) L2 L3 L4 L5 L6												
<p style="text-align: center;">↓</p> <p style="text-align: center;">ICT business process Information and Communications Technology (ICT) Sector Size of company</p> <p style="text-align: center;">↓</p>	ICT work process (A)	Phase of activity (A.1)	Work task (A.1.1) Work task (...)	ICT practitioners ...												
		Phase of activity (A...)	Work task (...1) Work task (...)													
			Work task (...)													
			Work task (...1) Work task (...)													
		ICT work process (...)	Phase of activity (...1)		Work task (...1.1)	<table border="1" style="width: 100%; text-align: center;"> <tr> <th colspan="3">Work task (...)</th> </tr> <tr> <th>Objects (technologically and / or commercially)</th> <th>Methods, tools and organisation</th> <th>Requirements, provisions, regulations</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	Work task (...)			Objects (technologically and / or commercially)	Methods, tools and organisation	Requirements, provisions, regulations				ICT practitioners ...
					Work task (...)											
	Objects (technologically and / or commercially)			Methods, tools and organisation	Requirements, provisions, regulations											
	Work task (...)															
	Phase of activity (...)		Work task (...1) Work task (...)													
	Phase of activity (...1)		Work task (...1.1) Work task (...)													
			Phase of activity (...)	Work task (...1) Work task (...)												
				Phase of activity (...)	Work task (...1) Work task (...) Work task (...)											
	ICT work process (...)	Phase of activity (...1)	Work task (...1.1) Work task (...)	ICT practitioners ...												
			Phase of activity (...)		Work task (...1) Work task (...)											

© EUQuaSIT 2004

Figure 24 GAHPA model to structure the ICT business process and workflow analysis (Petersen/Wehmeyer 2004)

Information and communication technologies are examined within the example in Figure 24. The model and method used could of course also be applied in other sectors.

7 Organisation and Financing of VET

An important role regarding the organisation of VET in praxis is assigned towards the competent bodies. Competent bodies are various chambers. Part 3 Section 71 of BBIG defines them:

(1) The chamber of crafts and trades shall be the competent body for the purposes of this Act in matters relating to vocational training in the occupations of the crafts and trades.

(2) The chamber of industry and commerce shall be the competent body for the purposes of this Act in matters relating to vocational training in industrial and commercial occupations other than those of the crafts and trades.

(3) The chamber of agriculture shall be the competent body for the purposes of this Act in matters relating to vocational training in occupations in the field of agriculture, including domestic service in agriculture.

(4) The chambers of lawyers, patent attorneys and notaries shall be the competent bodies for the purposes of this Act in matters relating to vocational training of skilled staff in their respective specialties in the field of judicial administration; the same shall be true of the notaries' funds for their sphere of activity. chambers of public accountants

...

chambers of physicians, dentists, veterinarians and pharmacists

...

For more details please see (Federal Ministry of Education and Research 23.03.2005)

7.1 The role of competent bodies

Competent bodies are so called corporations under public law. These self-regulatory organizations have to some degree the regulatory authority over a profession or sector. These statutory bodies are especially authorized in VET in behalf of the Federal government under the terms of BBIG to perform the following tasks:

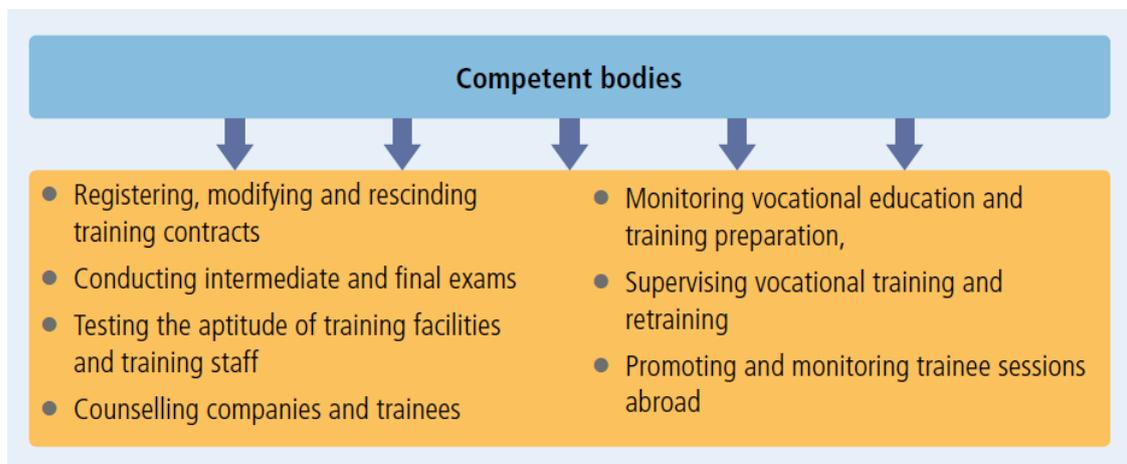


Figure 25 Tasks of the competent bodies (Bundesinstitut für Berufsbildung (BIBB) 2013b)¹⁶

¹⁶ For more details see Federal Ministry of Education and Research (23.03.2005) Part 3

Background:

The responsibility for VET was always a task of the relevant economy. The companies of course had the most interest to generate highly skilled workers in order to produce valued goods and services. In history this responsibility was tied to the guilds, the former associations of craft. Out of these associations the chambers have arisen. This is the reason why the chambers still holds the task to organize VET. It is one of their traditional duties.

According to the basic principle of dual VET in Germany the social partners are part of the competent bodies (Federal Ministry of Education and Research 23.03.2005)Section 77.

(1) The competent body shall establish a vocational training committee. The committee shall consist of six employers' representatives, six employees' representatives and six vocational school teachers, the teachers having the right to speak but not to vote.

(2) The employers' representatives shall be appointed on the proposal of the competent body, the employees' representatives on the proposal of the trade unions and independent associations of employees concerned with matters of occupational and social policy established in the district of the competent body, and the vocational school teachers by the authority competent under Land law; all appointments shall be for a period not exceeding four years

It is remarkable to point out the limited right of the teachers of vocational schools. It reflects the power of social partners regarding decisions within VET organization also at the praxis level. The state here represented by the VET school teachers has limited influence. It is notable that this work is done in an honorary capacity. It reflects the strong commitment of the economy to support this dual system VET principle.

(3) The members of the vocational training committee shall serve in an honorary capacity. Insofar as they receive no compensation from any other source, they shall be paid appropriate compensation for out-of-pocket expenses and loss of time, at a rate to be fixed by the competent body with the approval of the supreme Land authority.

7.2 Examination board

Beside the administrative tasks “conducting intermediate and final exams” is a major duty of the chambers. The final examination shall

determine whether examinees have acquired the necessary vocational competence. In the final examination examinees shall demonstrate that they have mastered the necessary vocational skills, possess the necessary vocational knowledge and qualifications, and are acquainted with the subjects taught at part-time vocational school as an essential part of their initial training. The examination shall be based on the initial training regulations.

(Federal Ministry of Education and Research 23.03.2005)Section 38

The competent body shall therefor establish examination boards. Section 40 (ibid)

(1) The board of examiners shall consist of at least three members. The members must be experts in the fields covered by the examination and must be suitable persons to act as examiners.

(2) The membership of the board of examiners must include equal numbers of employers' and employees' representatives and at least one vocational school teacher. At least two thirds of the total membership must consist of employers' and employees' representatives. Each member shall have a substitute.

In praxis the chambers have different branches responsible for different regions within Germany. Depending on the number of trainees within a training occupation in a specific region the examination boards are established. Usually for each training occupation one examination board is formed. The boards are regional and act for the trainees educated in that region which belongs to the respective branch of the chamber. The examiners are company representatives. They are experts in their vocational field. The vocational school teacher is the expert from the vocational part time school teaching this vocational profile.

The examination is processed according rules of the training regulations (see chapter 4.4.2)

7.3 Financing initial VET

The financing of VET in Germany is based on the shared responsibilities of involved public and private parties. These are among others ministries as the Federal Ministry of Education and Research (BMBF), the Federal Ministry of Economics (BMWi), the Federal Agency for Employment (BA), ministries of the federal states, unions, chambers, the town councils, companies and the involved persons itself.

Focusing on dual training the school part is financed by tax money of the federal states. They are for example responsible for school supervisory, teacher education, teacher salaries. The town councils take over the premises and facilities and investment of teaching material. The companies finance the in-company training. In general it is a free decision of the company to offer training possibilities according the state certified training occupations. As stated the trainees keep a training contract with their company. The trainees received wages depend on determined tariffs regulated by the social partners. In general the monthly wages are one third of the wages a skilled worker would earn after completion of education and increase in each year of training. In total the companies cover most of the costs of VET. It has to be noted that despite of costs for instructors and trainees wages the benefit of the trainees work is reasonable. According to research results from 2007 the gross costs for dual VET in Germany were 23,8Mrd € subtracting the benefit of trainees contribution a net cost of 5,6Mrd € remained p. 283 (Bundesinstitut für Berufsbildung (BIBB) 2013a).

Good practice for finance VET in building industry

As stated in chapter 4.3 only 21% of companies offer training in VET. The willingness and also the possibilities to offer in-company training are limited. This is a problem the building industry has solved in a good way.

Since 1970th they introduced a shared funding to finance companies offer VET training. Companies even if they are self-employed have to pay into a VET fund for building industry initial VET. The amount is for example 1.65% of gross wages (SOZIALKASSE DES BERLINER BAUGEWERBES 2003). All companies offering initial VET can claim back different training cost (Industriegewerkschaft Bauen-Agrar-Umwelt 2014).

This procedure has proven sustainable amounts of trainees and so skilled worker in building industry.

8 Additional Questions (according mail from 9.02.15)

1. *The role of the government and social partners in an organizing independent system of assessment of qualification (sharing of tasks)*

Within initial VET the participant who create training regulations and assess the qualifications are the same. The government established the basic legal framework and enacts the training regulations, see chapter 4.1 and 4.4. Moreover it guides the development process. The actual content and execution of assessment is done by social partners (unions and employers), see chapter 7.2. The roles of different stakeholders are summarized in the following figure:

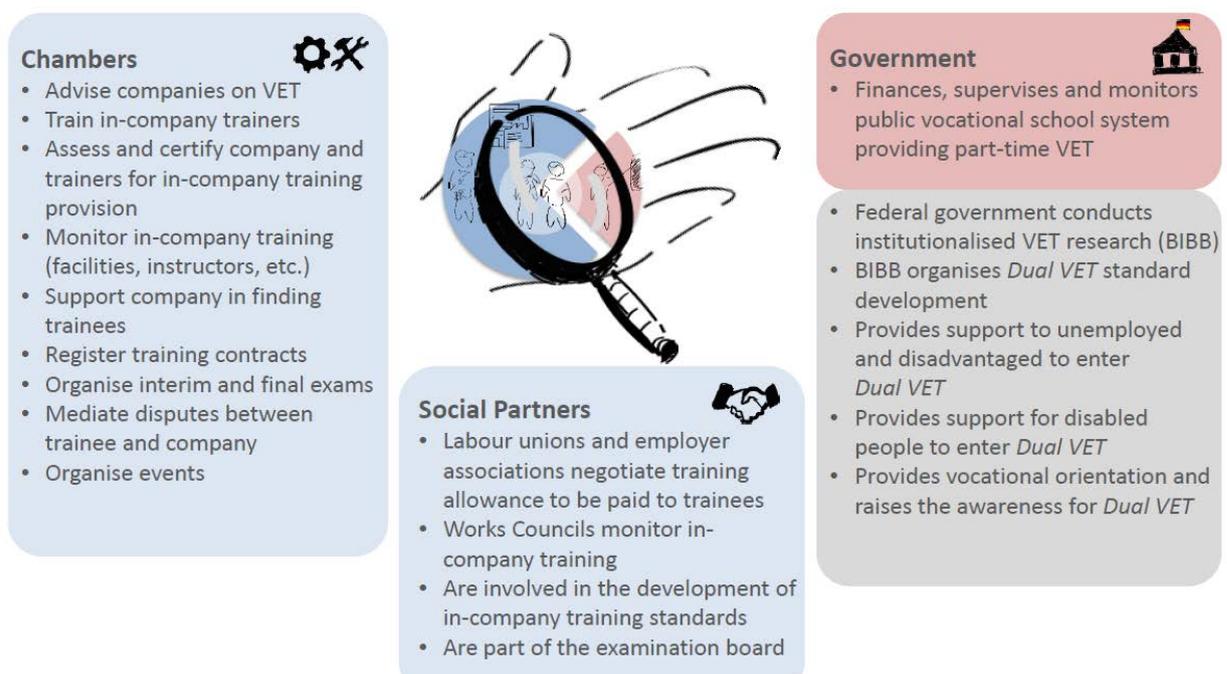


Figure 26 Business community, social partners and government are all involved in the Dual VET (German Office for International Cooperation in Vocational Education and Training 2014)

2. *Which body coordinates this work and develops legal framework - non-governmental structure (e.g. tripartite commission - employers, trade unions, government) or government (Ministry)?*

The BIBB (Federal institute for VET) coordinates this process, see chapter 5.

3. *Who should be covered by the certification system (in addition to obligatory groups set by the government): uncertified engineers? Should graduates of different levels of education undergo certification?*

The competent bodies are authorized by the government to carry out the organization of certification. The examination boards exist of social partners (these company experts are usually skilled worker/ professions. Of course they must have the relevant knowledge) plus a VET school teacher, see chapter 4.4.2 and chapter 7.2. No further obligatory groups are present. The examination board is responsible for the final examination. The examiners are officially appoint-

ed to that board. They are obliged to follow the rules and principles of examinations, if necessary they are trained by the chambers (only in examination principles, not in occupational specific details)

4. Does a person have a right to work without certificate?

In principle yes, but this depends on the occupation. Occupations which require high social demands are so called regulated professions. Usually the practice of these professions comprises a high risk to harm people or the environment or the jobholder itself. For example a nurse, medical practitioner, pilot, teacher, electrician, civil engineer etc. are regulated professions and need a certificate.

Apart complete professions also specific tasks within an occupation could be regulated. These tasks where endangerments could come out are also regulated and require additional certificates. The issue about regulated professions and regulated tasks is problematic when comparing occupation between countries.

Working without any certification is also not recommended for not regulated professions. The wages of a person successfully finished initial vocational education is much higher than without any certification.

5. Is certification obligatory? For example, if the employer sends the worker for certification and covers this expenses. Is it a must for the worker to undergo this certification?

If working tasks require certification or further education on the job is necessary, it is usual that the worker takes the training and passes the certification. Certifications are especially necessary regarding “regulated tasks/professions, see last question). Usually a company would not hire a person without the certification if this is needed for a specific job. In general each person is free to decide whether to do an initial VET and pass it or not. Without certification the chances on the labor market are poor, risk for unemployment is high. The wages are respectively low. The best “insurance” against unemployment is to complete an initial VET.

6. Who gives the right to some organizations that conduct certification to do it? Who and how controls the activities of such organizations?

The chambers are authorized by the government, see chapter 7.1

The state supervisory body controls the chambers. Note within the examination boards the social partners are present and “control” in this way also the certification.

7. Funding of organizations that conduct certification (at the expenses of employers, citizens, government or other sources?)

The chambers are funded by its members. Usually all companies are obliged members and have to pay fees. Additionally they pay fees towards the chambers for the number of trainees enrolled for training in their company to cover examination expenses etc. The members of the examination board work on honorary basis.

8. Which information about certification at the national level is open for employers and workers?

Basically all information is open for everyone. Legal frameworks, training regulations, processes of examination etc. are all open for public and fully transparent. They are published via internet. The theory part of the final examination (compare chapter 4.4.2) is of course not open before the date of examination. Depending on the training occupation the day of this examination

is fixed for all trainees in Germany. E.g. IT-specialists have one central day of examination with the same content.

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