Ensuring permeability between VET and Higher Education at national level: Examples and Cases
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Country Report Germany

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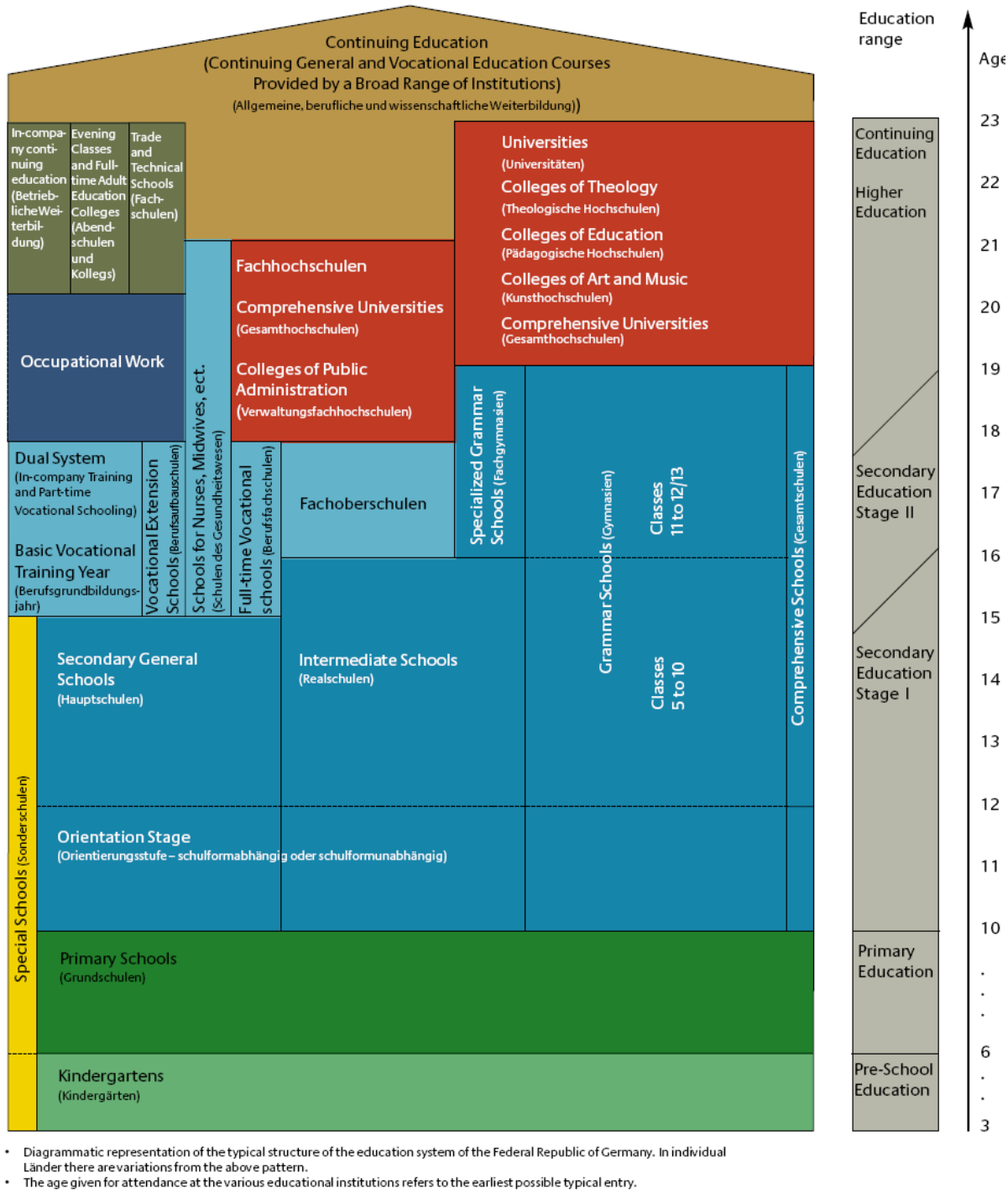
1. General overview

1.1. The Education System in Germany

There is hardly any country where the permeability between VET pathways as well as between VET and HE is marked by the structures and regulations of the educational system as strongly as in Germany. The place value of degrees and institutionalized education play a decisive role for the regulation of this permeability.

In principle, the educational system in Germany has a consistent structure which, however, only gets transparent after studying several sources on it:

- The *Federal Ministry of* E*ducation and* R*esearch (BMBF)* represents the German educational system with the overview of Figure 1 (cf. http://www.bmbf.de/pub/bildung_in_deutschland.pdf) In addition a regular education report is published which also - together with detailed information - informs about the permeability of the educational system in Germany (cf. www.bildungsbericht.de). The possible transitions from VET to HE are not immediately detectable from the overview, though and moreover, these transitions have developed very dynamically within the last few years. This is not least due to the widespread responsibility for the "education" which is not incumbent to the federation but the federal states of Germany (independence in matters of education and culture of the federal states).
- To guarantee nationwide uniform standards and a sufficient degree of things in common for the processes of education, the Standing Conference of the Ministers of Education and Cultural Affairs of the federal states in the Federal Republic of Germany (short: Conference of Ministers of Education or KMK) was founded. The KMK is an association of the ministers or senators of the federal states responsible for education, universities and research as well as cultural matters . The Conference of Ministers of Education has set up a synopsis which shows how in the single states the transition to HE can be managed for potential students without a regular study authorization (achieved at schools) (cf. http://www.kmk.org/hschule/Synopse2007.pdf). This is particularly relevant for persons in employment and with curriculum vitae primarily based on professional experience. The KMK furthermore gives recommendations and sets agreements as well as standards regarding VET as well as HE.
- The European platform *PLOTEUS (*http://europa.eu.int/ploteus) helps education seekers to find the necessary information about the educational system; here the individual states of Germany present their paths of education separately. A similar illustration by the BMBF with a synopsis of the educational system published by the KMK every year in coordination with the federation and the German federal states in the context of the "information network to the education system in Europe" (EURYDICE) is found under http://www.kmk.org/doku/bildungswesen.htm It describes the responsibilities, structures and also current developments in the education policy.



- Diagrammatic representation of the typical structure of the education system of the Federal Republic of Germany. In individual Länder there are variations from the above pattern.
- The age given for attendance at the various educational institutions refers to the earliest possible typical entry.

Figure 1: Basic Structure of the Education System of the Federal Republic of Germany

Altogether, the transitions from VET to HE are so heterogeneous that they can hardly be presented in a comprehensive way.

Although the German educational system is accused of a high social selectivity, there is nevertheless a high "formal permeability" at the same time. From every level of education it is theoretically possible to go to secondary school and university careers even if this possibility is used only marginally in the area of VET. Consequently there is no school and university career below the university in Germany which excludes further formal educational facilities and is designed *only* for the admission into the world of work. So somebody with a vocational training can go to a FE college even after only a short time of work and achieve the matriculation standard (FHR) there .

The application of ISCED to the German educational system is therefore difficult. ISCED levels, which lead to the direct admission to the labour market (levels 2 C, 3 C and 4 C) can at the same time be qualifications, which correspond to the levels 2A / 2 B, 3 A / 3 B or 4 A/ 4 B (cf. *Figure 2*).

	ISCED-Level	Bildungsabschlüsse
Low	**Primary Education** (ISCED 1)	Ohne allgemeinen Schulabschluß; ohne beruflichen Abschluß
	Lower Secondary Education (ISCED 2)	1 Hauptschul-/Realschulabschluß/POS; ohne beruflichen Abschluß 2 Hauptschul-/Realschulabschluß/POS; Anlernausbildung, Berufliches Praktikum 3 Hauptschul-/Realschulabschluß/POS; Berufsvorbereitungsjahr 4 Ohne Hauptschulabschluß; Anlernausbildung; Berufliches Praktikum 5 Ohne Hauptschulabschluß; Berufsvorbereitungsjahr
Medium	**Upper Secondary Education general** (ISCED 3A)	Fachhochschulreife/Hochschulreife; ohne beruflichen Abschluß
	Upper Secondary Education vocational (ISCED 3B)	1 Abschluß einer Lehrausbildung 2 Berufsqualifizierender Abschluß an Berufsfachschulen/ Kollegschulen, Abschluß einer einjährigen Schule des Gesundheitswesens
	Post-Secondary Non Tertiary Education general ISCED 4A	1 Fachhochschulreife/Hochschulreife **und** Abschluß einer Lehrausbildung 2 Fachhochschulreife/Hochschulreife **und** Berufsqualifizierender Abschluß an Berufsfachschulen/Kollegschulen, Abschluß einer einjährigen Schule des Gesundheitswesens
High	**First Stage of Tertiary Education** ISCED 5B	1 Meister-/Technikerausbildung oder gleichwertiger Fachschulabschluß, Abschluß einer 2- oder 3jährigen Schule des Gesundheitswesens, Abschluß einer Fachakademie oder einer Berufsakademie, 2 Abschluß einer Verwaltungsfachhochschule 3 Abschluß der Fachschule der ehemaligen DDR
	First Stage of Tertiary Education ISCED 5A	1 Fachhochschulabschluß (auch Ingenieurschulabschluß, Bachelor-/Masterabschluss an Fachhochschulen, ohne Abschluß einer Verwaltungsfachhochschule) 2 Hochschulabschluß (Diplom (U) und entsprechende Abschlussprüfungen, Künstlerischer Abschluss, Bachelor-/Masterabschluss an Universitäten, Lehramtsprüfung)
	Second Stage of Tertiary Education (Research Qualification) ISCED 6	Promotion
	ISCED 9	Keine Angabe

Figure 2: Assignment of the qualifications according to ISCED in Germany (Statistical Federal Office, micro census.)

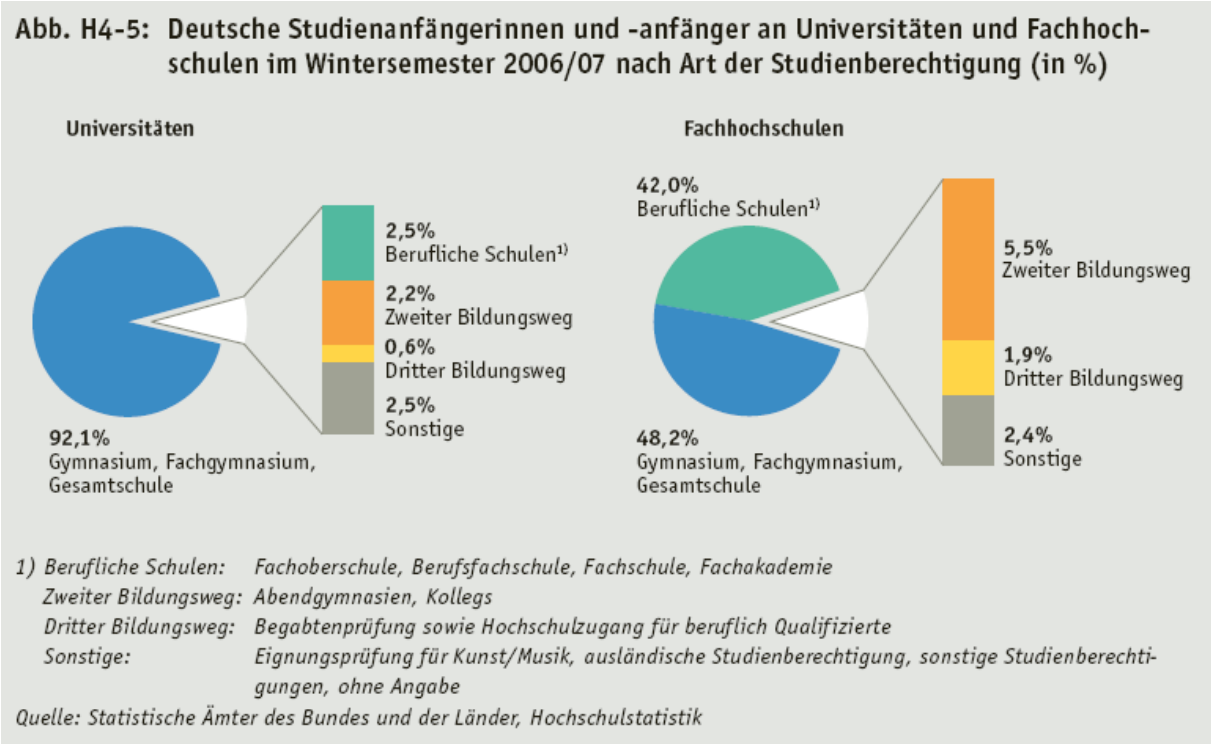


Figure 3: First semester students in Germany differentiated by their educational pathways (cf. education report 2008, p. 176)

The "classic transitions" of the secondary school level II (ISCED 2, 3 and 4) to the university level meanwhile develop very dynamically and individually in the context of state-related pilot projects and experiments. The classic and traditional way of transition to the university, comprehensive university or university of applied sciences is the one from the German "Gymnasium"; transition from ISCED 3 A to 5 A).

92.1% of first semester students at universities have the "Abitur" as matriculation standard which was achieved at a secondary school (Gymnasium), special secondary school (Fachgymnasium) or a comprehensive school (cf. Figure Figure On the other hand, these students make up only 48.2% at universities of applied sciences, while the other half has achieved their matriculation qualification in the area of VET.

Altogether, 17% of the persons qualified for HE in 2006 had a completed vocational training (cf. education report 2008, p. 170). After completion of the studies approx. 28% of the graduates of the universities at the same time *also* have a completed nonacademic vocational training (cf. professional formation report 2008, p. 105). At present, the direct permeability of the VET to the HE still is of marginal importance, though. Therefore the initiative ANKOM was started, which should examine and promote the transfer of credits of professional competences to university courses (cf. http://ankom.his.de).

1.2. Formal Ways from VET to HE

In principle there are three models of acknowledging (in a broad sense) competences from the area of the professional education and particularly the competences achieved by professional experience for HE:

1. Access to university studies
   - Granting access to the university for graduates without formal higher education entrance qualification (Abitur) by entrance examinations, rehearsal studies or individual regulation;
   - Acknowledgement of professional education as an equal studies entitling degree.

2. Giving credits for professional competences with regard to HE
   - Up to 50% of a higher education can be replaced by knowledge and abilities which have been acquired outside the university system (cf. KMK 2002).
   - The "value" of VET in view of HE is increased by measures which simultaneously combine *vocationally orientated degrees* without formal HE entrance qualification *with degrees* of *general educational orientation* with *a* formal HE entrance qualification.

3. Combination of courses of VET and university studies
   - A third model are dual studies (Duales Studium,Triales Modell) which combine vocational training and university careers.

1.2.1. Entrance examination, test studies, individual regulation

The university entrance by means of entrance examination, sample studies or individual regulation is regulated differently in every federal state and also differently from university to university. Depending on the regulations persons with a completed VET and professional experience can enrol for university studies particularly when being in possession of a master craftsman's certificate (so-called "master studies") . The synopsis of the KMK (2007) gives information about the way of the different regulations.

The special university access for qualified professionals is regulated by an ordinance in North Rhine-Westphalia, for example. Similar ordinances exist in other federal states.

"The following groups are accepted as applicants to the studies in a technically corresponding course at universities of applied sciences:

1 Masters according to the law of professional education and the crafts code,

2 graduates of two-year technical trainings at the FE colleges,

3 business administrators and management assistants and

4 geriatric nurses qualified in accordance with § 2 of the further education law (NRW 2003, § 1)".

1.2.2. Acknowledgment as an equal degree

Besides the courses of VET leading to a university career (cf. Table 1; Enabling the study access) there is an increasing number of courses which combine a vocational training with the abitur or the matriculation standard in the dual system. Thus pilot projects are generally carried out in the federal states or the structure of the VET (at colleges) tailored so that a studies entitling degree is made possible (Berufskolleg).

Type of school	*Qualification*	*Duration;remarks*
Berufsfachschule	Entitlement to studies at the university of applied sciences (FHR)	3 years, several types, regulations by the KMK (2001)
Berufsoberschule	subject-linked university entrance qualification Matriculation standard (Abitur) (if a second foreign language has been chosen by the student)	2 years with a vocational training preceding
Fachgymnasium	Matriculation standard (Abitur)	3 years
Berufliches Gymnasium	Matriculation standard (Abitur)	3 years, is the successor of the Fachgymnasium
Fachoberschule	Entitlement to studies at the university of applied sciences (FHR)	2 years with a vocational training preceding
Fachschule	Entitlement to studies at the university of applied sciences, if the standards of the KMK (2001) are heeded (FHR)	2 years, other types possible

Table 1: Formal pathways which lead to HE (regulations determined by the federal states)

1.2.3. Accreditation of competences

The combination of an apprenticeship with lessons at the technical college leading to the matriculation standard still has experimental status. Either this combination is termed "double qualifying vocational training" (degree in Germany: Entitlement to studies at the university of applied sciences) or called "vocational training with abitur" (general matriculation standard). Some vocational colleges offer such degrees in combination with certain apprenticeships. So the "dual vocational training with matriculation standard for the university of applied sciences" (DBFH) is offered in Bavaria, where the necessary competences for the entitlement to studies at the university of applied sciences are achieved by attending the Fachoberschule for half a year taking into account that the participating students achieve the vocational qualification within two and a half years in compact form.

As a rule, in other federal states a training period of 4 years is standard for a double qualifying education. The countries determine the college locations and the combination possibilities with certain vocational trainings.

One example from NRW:
http://www.schulministerium.nrw.de/BP/Schueler/Studium_und_Beruf/Beruf/BerufsausbildungUndMehr/BerufsausbildungFHR/index.html#A_9 ;
One example from Bavaria:
http://www.stmuk.bayern.de/imperia/md/content/pdf/schulen/liste_der_berufe_und_betriebe_f_r_dbfh_2007_08.pdf).

In Berlin the upper school centre information and medical engineering (OSZ IMT since the school year 2003/04) offers a course "vocational training plus abitur" within 4 years in cooperation with Deutsche Telekom AG as a ministerial test run.

The studies and exam regulations of the universities can and should *credit* professional competences (cf. KMK 2002) for an HE career. The type of the accreditation is regulated in the various studies and exam regulations of the universities. The accreditation of competences is of special interest for the

application of the VQTS model and is discussed in chapter 2 with the description of cases .

1.2.4. Combination of courses of vocational training and university careers

So-called dual courses of studies have been developed and offered particularly in the sector electrical engineering within the last few years and often under cooperation of the chambers. Dual courses of studies combine an HE with an apprenticeship. The studying place technical college can also be replaced by the university. Because of the cooperation of the three studying places enterprise, technical college and university (mostly university of applied sciences, partly also professional academies) this model is then also called "Triales Modell" or training-*integrated* course of studies. One example of a "Triales Modell" is a course of studies at the university of applied sciences (FH) Kiel (cf. Figure 3 Figure 3

Figure 3: "Triales Modell" of the FH Kiel in cooperation with Berufliche Schule in Kiel-Gaarden and IHK-enterprises

The FH Kiel combines the apprenticeship as an IT system electronics technician or as a computer specialist with a special HE course of studies "Internet Science and Technology". The professions "IT system electronics technician" and "computer

specialist" belong to the 4 newly-created apprenticeships/professions (since 1997) in the IT area that require a three-year training period. The course of studies “Internet Science and Technology” is a 6-semester bachelor course of studies. The university of applied sciences, the technical college and enterprises represented by the chamber of industry and commerce (IHK) are involved in this "Triale Modell". With that it is made possible for school leavers with abitur to first begin an apprenticeship and partly simultaneously obtain the bachelor of Science in shorter time (altogether 5 years instead of 6) . More information under http://www.fh-kiel.de/index.php?id=3527.

The information portal "education plus" lists currently 84 dual courses of studies in the area of electrical engineering in Germany (updated 20/06/2008), which makes clear the increasing significance of this dovetailing of apprenticeship and HE (cf. http://www.ausbildungplus.de).

The manner of the dovetailing of VET and HE is quite diverse. Common to all models is a shortening of the vocational training to two or two and a half years maximum and as a rule a shortening of the lessons time at the technical college or the replacement of this time in favour of the student days. The on-the-job training parts are predominantly carried out during the university vacation time. Thus the training period is shortened.

Some federal states have declared this type of dovetailing a preferential model in form of a training offensive, so e.g. in Hesse (cf. http://www.dualesstudium-hessen.de/) and Rhineland-Palatinate (cf. http://dualesstudium.rlp.de). Dual studies are defined as *a profession*-integrating HE if they are carried out on the job that is after conclusion of an apprenticeship. The older publication of the commission of the States in the Federation about the dual studies informs about the basic approaches (cf. BLK 2000).

2. Cases

2.1. General description and background

In paragraph 1 it became apparent that the formal pathways from VET to HE have been expanded by a variety of single models, regulations and ministerial pilot projects. Nevertheless the permeability of the VET to the HE is only very low . Only 1.094 (0,25 %) of the 445.427 graduates of the technical colleges in the year 2006 obtained a special entitlement to studies at the university of applied sciences (cf. Statistical Federal Office, special series 11, publication series 2) and only 4.3% of all undergraduates have acquired their HE entrance qualification via the second (night school, "Kolleg") or third formal pathway channel (undergraduate without higher education entrance qualification achieved at school) (cf. Figure 4 Figure 4 The undergraduates matriculated through a professional training are also subsumed under "third pathway channel". An analysis of the BLK concludes *that nationwide* on average considerably less *than 1 per cent (state data*: *0*.7 *to* 0.8%; StaBuA *0*.3 to *0*.5%; ZVS: 0.2%; HIS: between 0.6 and 0.8%; Scientific council: 0.25%) can begin the undergraduate studies due *to the*ir VET. (BLK 2005, p. 3)

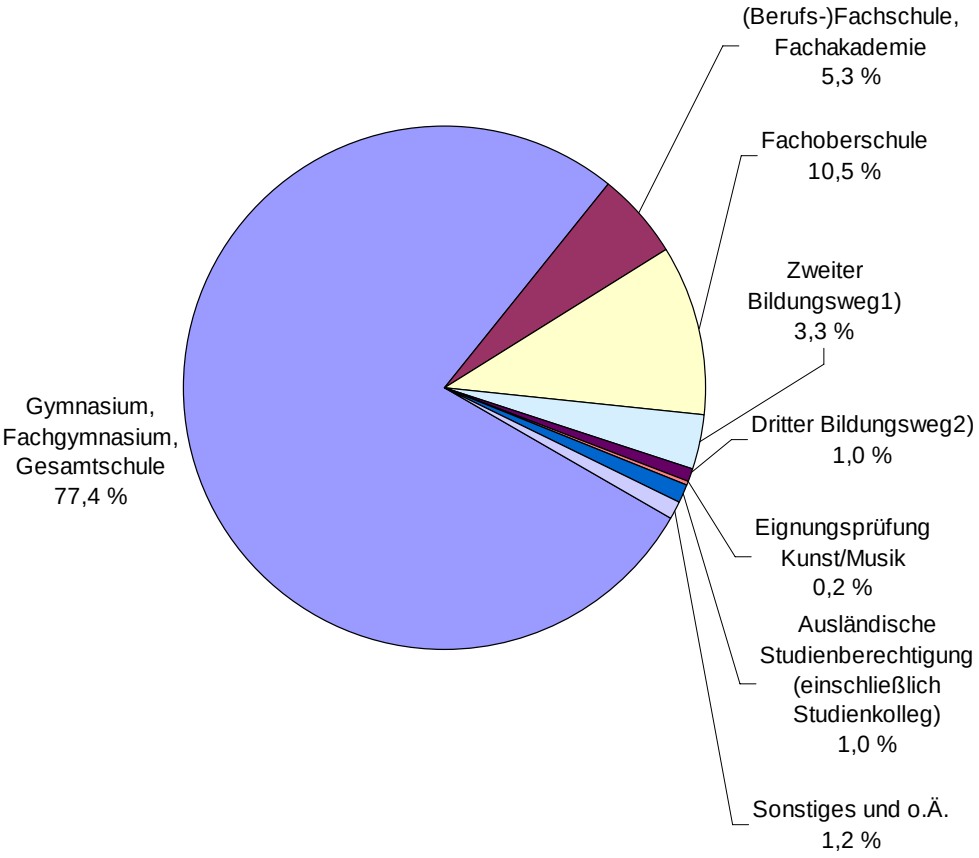


Figure 4: Undergraduate to universities in Germany according to the type of higher education entrance qualification (source: Education report 2008, table H4 3 A.)

Cases in which there are intersections between sector-related contents from the VET and HE which, till now, could not be accredited are of special interest in the project VQTS-II, in which a special focus has to be put on the sector electrical

engineering/electronics . Focussing on electrical engineering/electronics as a domain means that professional competences for the mastery of work tasks (core work tasks) are in the centre. Particularly such professional competences are therefore relevant, independent of where they were obtained, which are in connection with professional tasks (professional decision-making and responsibility). This includes particularly competences which were developed during professional work. The professional experience and the hereby connected, rather informal, studying forms can only be made visible by contents-related descriptions of the professional competences. A formal description of educational pathways is not useful here. This can neither be formally described by descriptors (Knowledge, Skills, Competences) because the context remains undefined where the professional competence is or can be effective. A grading by levels neither changes this. The European qualification framework (EQF) and a national qualification framework (NQF) in this respect deliver only clues about the value of qualifications.

A first attempt to tackle these difficulties is to describe the acquisition (process) as well as the formal (qualification) and the content-related (for the execution of professional tasks) significance of competences for the HE by describing individual careers.

2.2. Description of the Cases / Analysis of Vocational Biographies

Career-related interviews with graduates of the technical college of further education (Fachschule at Eckener Schule,Flensburg) were carried out. These graduates followed different pathways; so their interviews helped to determine the “value" of professional competences for HE exemplarily in the area of electrical engineering.

The persons asked were former students of FE technical colleges, e g. the above mentioned one, in the field of study *electrical engineering/main emphasis process automation* and are at present students of the university of applied sciences in the bachelor course of studies energy systems engineering. Two students have been questioned at present.

2.2.1. Career information

The first person interviewed (B1) is male and was born in 1978. He achieved the high-school diploma (Realschulabschluss) in 1996. In 2000 he finished an apprenticeship with the double qualification of becoming a skilled electrical assistant (ETA, qualification of the Berufsfachschule, ISCED 3B) and getting the HE qualification („Fachabitur“, ISCED 3B) and then was professionally working for 10 months in the area of examining electronics in the field of telemetry for gas monitors as well as 4 months as ETA. He simultaneously attended an evening course *electrical engineering - automation* at a technicians’ college. In 2002 a six-month job as worker in the sales department abroad followed.
He successfully passed the exam after the two-year course *electrical engineering - process automation* at the technical college of further education in summer 2005. Since autumn 2005 he has been enrolled as student at the university of applied sciences in energy systems engineering (BA).
The second person asked (B2) is male and was born in 1980. After the high-school diploma in 1997 (ISCED 2) he completed a three and a half year apprenticeship as energy electronics technician in the field *systems engineering* (ISCED 3C). With an interim professional practice as energy electronics technician and the completion of the national service he attended the technical college of further education Flensburg

in the field of study *electrical engineering - process automation* from summer 2003 until summer 2005. Since autumn 2005 he has has been enrolled as student at the University of Applied Sciences Flensburg in energy systems engineering (BA).
The people interviewed (B1 and B2) have attended the same courses and fields of study at the Technical College of Further Education and University of Applied Sciences.

2.2.2. Synopsis Technical College of Further Education and University of Applied Sciences

The persons B1 and B2 have gone to the same studies places and fields of study in the FE college and at the university of applied sciences. With the curricula of the technical college of further education and the course of study of the University of Applied Sciences, at first a formal comparison of emphases as regards content can be carried out. It has to be noted that some contents (English, electrical engineering, electronics, mathematics, natural sciences, and business administration) do not build exclusively on each other but often show coincidences.

"The base competences in electrical engineering, mathematics and physics are an important component of the first study terms. Then the foundation is laid upon which technically specified lectures will follow in later terms." (From: Information about enrolment and studying, University of Applied Sciences Flensburg, 2008)

In the interviews the following statements concerning the acknowledgment and significance of competences from the professional area could be gained.

B1:

At the Flensburg Technical College of Further Education neither the higher education entrance qualification (Fachabitur, ISCED 3B) nor the one-year attendance of the technician school in the same field of study – both achieved in a different federal state (Bundesland) – were acknowledged.

An acknowledgment of qualifications achieved at the technical college of further education was not applied for and therefore not granted. An acknowledgment can only be executed - so the statement of B1 - by the respective professors. Furthermore should in his opinion the technician or master courses be provided with credit points and be tied in the EQF system. However, this probably is not the case.

B1:

In principle, the technical college of further education and the university of Applied Sciences are distinguished by B1 in their way of dealing with the students. The technical college of further education takes the students by the hand and leads them in their course community in a compactly organized further education within two years towards a degree. The motivation is mainly generated by the teaching style .

On the other hand, the University of Applied Sciences demands the autonomous studies of the single student. This attitude prepares the student for a future career as engineer. The motivation is the will to do and to be better than the other students. Otherwise the student gets little support by the lecturers of the university of applied sciences.

FE College of Design and Technology Flensburg FE college (Fachschule) Field of study ***power engineering and process automation***				University of Applied Sciences Flensburg University of Applied Science (Fachhochschule) Field of study ***energy systems engineering*** (BA.)		
1. Sem.	2. Sem.	3. Sem.	4. Sem.	1. Sem.	2. Sem.	3. Sem.
German/com-munication (30 lessons)	German/com-munication (30 lessons)	German/com munication (30 lessons)	German/com munication (30 lessons)			
Mathematics (60 lessons)	Mathematics (60 lessons)	Mathematics (60 lessons)	Mathematics (60 lessons)	Mathematics 1 (64 lessons)	Mathematics 2.1 (64 lessons)	Mathematics 2.2 (64 lessons)
				Mathem. + techn. SW-tools (64 lessons)		
English (40 lessons)	English (40 lessons)	English (40 lessons)	English (40 lessons)	English 1 (32 lessons)	English 1 (32 lessons)	
Electrical engineering (100 lessons)	Electrical engineering (100 lessons)	Energy and drive electronics (100 lessons)	Energy and drive electronics (100 lessons)	Electrical engineering (64 lessons)	Electrical engineering 2.1 (64 lessons)	Digital technology (64 lessons)
		Energy technical systems (120 lessons)	Energy technical systems (120 lessons)	Electrical engineering (64 lessons)	Electrical engineering 2.1 (64 lessons)	Electrical engineering 2.2 (64 lessons)
Natural sciences (40 lessons)	Natural sciences (40 lessons)	Natural sciences (40 lessons)	Natural sciences (40 lessons)		Physics 1 (64 lessons)	Physics 2 (64 lessons)
Electronics (80 lessons)	Electronics (80 lessons)				Measuring technique (64 lessons)	Electronics 1 (64 lessons)
Business administration (80 lessons)	Business administration (80 lessons)	Quality management (40 lessons)	Quality management (40 lessons)	Business Administration (32 lessons)	Law (32 lessons)	
Economy/ politics (40 lessons)	Economy/ politics (40 lessons)					
Technical communi-cation (60 lessons)	Technical communi-cation (60 lessons)	Technical information technology (100 lessons)	Technical information technology (100 lessons)	Electronic data processing (64 lessons)		
		Automation engineering (100 lessons)	Automation engineering (100 lessons)			Control engineering (64 lessons)
520 lessons	**520 lessons**	**640 lessons**	**640 lessons**	**384 lessons**	**384 lessons**	**384 lessons**

Table 2: Curriculum analysis: Comparing the syllabuses of the FE college and the university of applied sciences

Some examples for the differences were given by B1:

- At the University of Applied Sciences Flensburg English is restricted to learning technical words whereas at the FE college Flensburg the focus was on the language itself.
- The subject electrical engineering are to the effect different that rudimentary formulae are applied practice-related at the technical college of further education whereas at the university of applied sciences the theoretical basis is the centre.
- Mathematics lessons at the technical college of further education target at an equalization of the different mathematical prerequisites on the part of the students and is brought with simple examples only up to the integral and differential equation. The lectures are right from the start more abstract and more demanding at the university of applied sciences.
- The automation engineering at the technical college of further education could be taken as a very good basis for the studies at the university of applied sciences.
- The area of technical computer science was lined up too little object-oriented unlike at the university of applied sciences.

In the case that the obligatory prerequisite to the BA studies had been part of his professional biography already he would not have attended the technical college of further education.

With regard to the acknowledgment of qualifications achieved at the technical college of further education B2 quoted the remark of the student office that the technical college of further education is a good prerequisite for the successful visit of the university of applied sciences.

The person B2 exemplarily referred to similar contents in the two study places in the areas of electronics, machine technology, robot technology and automation engineering. The electrical engineering is on the other hand considerably different at the two study places since at the university of applied sciences the theoretical considerations and deductions are at the centre of studies.

In retrospect the standard in the areas of mathematics and natural sciences should get more demanding at the technical college of further education since only the infinitesimal calculus was reached or in natural sciences the learning contents remained rather superficial. With regard to the preparation for the university of applied sciences the complex calculation should be taught at the technical college of further education. The English lessons were by far better and more effective at the technical college of further education. The business administration lesson at the technical college of further education showed a clear and comprehensible structure unlike the lecture at the university of applied sciences. The programming served as a good preparation for the special higher education. All in all, the technical college of further education offers very good auxiliary modules like this master business administration course.

According to B2 technical college of further education is a place where studying is fun again and at which one is taken by the hand as a student. There was no stress and the entire organisation was well-adjusted. However, at the university of applied sciences the tuition is rather bad in comparison and much information is not spread properly to the students or some essential facts are not clear to every student, e.g. the new exam regulations.

The person B2 otherwise sees the technical college of further education as a good preparation for the studies at the university of applied sciences. Without the technical college of further education he would not have got the formal prerequisite (matriculation standard) and likewise the desire to study again.

3. Using the VQTS model

The career-related analyses make clear that formal designations and level assignment make little meaning for determining the value of professional competences for HE. On the other hand, a content-oriented VQTS matrix would make the competences more transparent particularly in the areas *of electronics, electrical machinery, robot technology and automation engineering* so that these could more easily be taken into accreditation.

According to the interviews which were not carried out in a representative dimension the competences achieved at the technical college of further education in business administration and in English seem to be of the same or even higher quality as those of the university of applied sciences. The value of the acquired knowledge for the professional competence as a state certified technician or also as an engineer does not get clear in the two cases. An integrated description which brings such knowledge in connection with professional tasks could offer advantages for both courses (technical college of further education and university of applied sciences likewise). A VQTS matrix would clearly improve the grading of such knowledge.

The VQTS model can be hardly used for the transfer of professional competences to the university area with regard to the "*mobility method*" developed in VQTS I because completely different mechanisms are relevant here as between institutions of the vocational training only. However, the identification of contents-related overlapping between contents of VET and contents of HE in an organisation profile can be used to be able to determine the accreditation with credit points also quantitatively.

The quality of the competence descriptions in the competence matrix proves to be once more a key to raising the transparency and the regulation of creditable qualifications in the transition from the vocational training to the higher education. The competence model lying behind this must take into account different areas of employment (market for qualified employees, labour market of university graduates) as well as different result expectations (output/outcome) of vocational courses and courses of higher education. This will represent a major challenge for the further development of the VQTS model.

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