

The changing nature and role of vocational education and training in Europe

VET in higher education: Country Case Studies

AO/DSI/JB/Changing_Role_of_Vet/009/15

Case study focusing on Germany

prepared for CEDEFOP – European Centre for the Development of Vocational Training

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This text is presented in its original form.

It has neither been revised nor edited by Cedefop.

The changing nature and role of vocational education and training – overall aims

The purpose of the Changing nature and role of VET-project is to improve our understanding of how VET is changing in the countries belonging to the European Union (as well as Iceland and Norway). Over a three-year period (2016-18) the project will analyse how vocationally oriented education and training has changed in the past two decades (1995-2015) and based on these results investigate the main challenges and opportunities facing the sector today and in the future. Work is divided into six separate but interlinked themes:

- (a) the changing definition and conceptualisation of VET;
- (b) the external drivers influencing VET developments;
- (c) the role of traditional VET at upper secondary level;
- (d) VET from a lifelong learning perspective;
- (e) the role of VET at higher education levels;
- (f) scenarios outlining alternative development paths for European VET

in the 21st century.

The study takes as its starting point that vocationally oriented education and training is something more than the traditional VET delivered at upper secondary level (in the form of school-based education or training, apprenticeships, or combinations of these). Due to the requirements of lifelong learning, we are able to observe diversification of VET with new institutions and stakeholders involved. We also see an expansion of VET to higher education areas, partly through reform of existing institutions, partly through the emergence of new institutions. This has been caused by factors internal to the education and training system as well as by external pressures linked to demographic, technological and economic changes.

This particular case study, together with 9 other case studies, provides input to theme (b) of the project ('The external drivers influencing VET developments').

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1. Introduction

On one hand, there is an **academic drift** in Germany when looking at the entrance number of students in higher education. On the other hand, the main growing sector is the sector of universities of applied science that traditionally provide practice-related study programmes. Having in mind the different types of dual study programmes that are characterized by a close link between theory and practice with long periods of in-company learning there is also a basis to talk about a **vocational drift** in higher education.

Traditionally in Germany, besides higher education there is a formal and state-recognized vocational pathway from IVET to **advanced vocational education on higher levels** of qualifications. There should be no qualification without the possibility of a subsequent programme leading to a higher level VET qualification or higher education.

The two pillars somewhat lost their borders, permeability for the benefit of the learner and its individual biographies became an important issue on the political level. There are many links and possibilities to transfer between them and the dual study programmes even form a hybrid approach integrating vocational and academic elements.

The establishment of the national qualifications framework was a process in which the equivalence of VET and general/academics education became a crucial issue. They are looked upon not as the same in content but as equal in esteem. This was a political setting but the debate included all stakeholders of the education system and the coherent shape of the framework can be seen a strong signal of the relevance of VET in Germany.

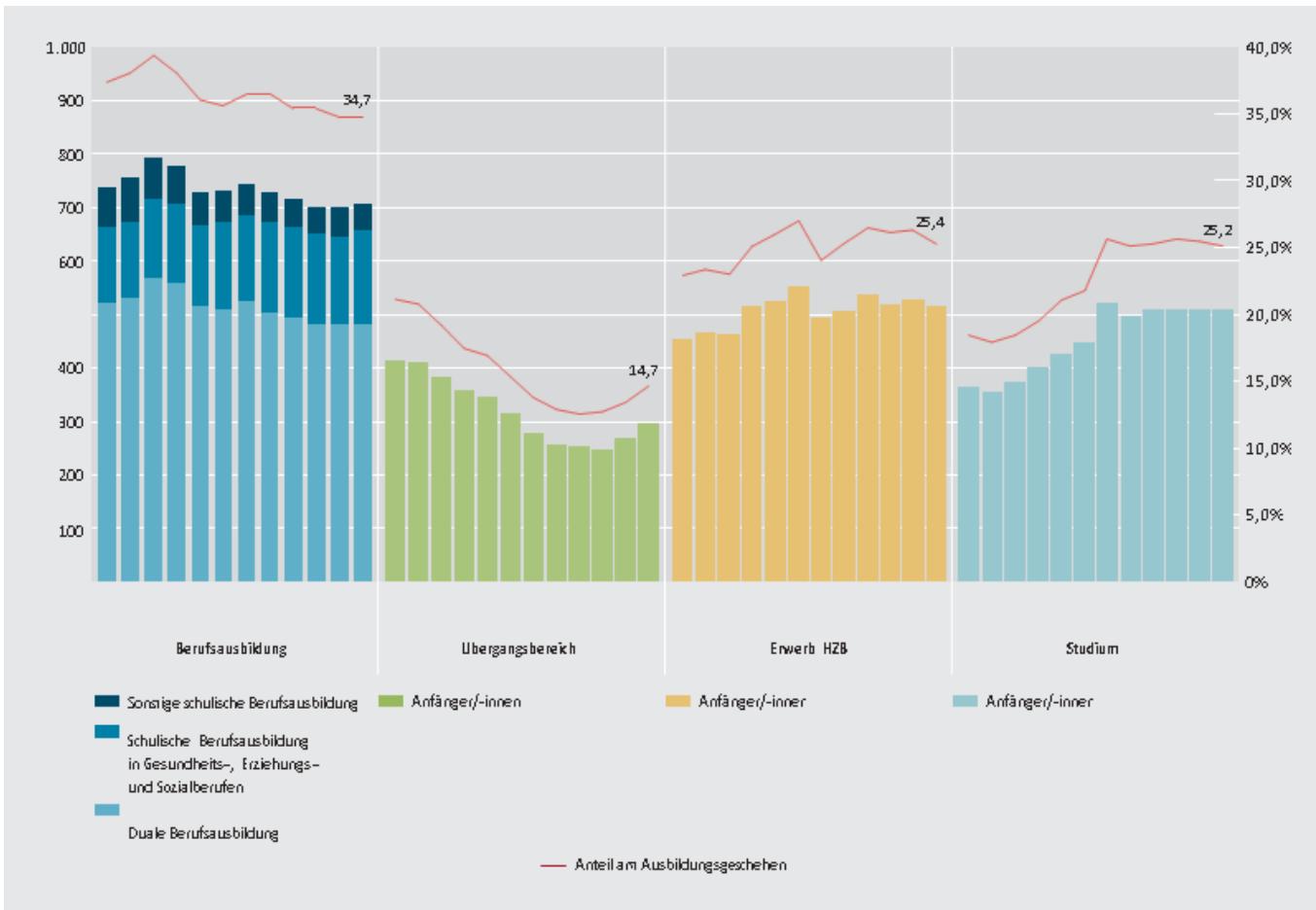
So there are signs of a vocational as well as an academic 'drift' in Germany.

2. VET at higher levels

In Germany there is a slight and steady decrease of IVET and a quite constant development in the number and rate of entrants to higher education after some years with a strong growth. The figure below shows the development of new entrants into different sectors of the education system after secondary education and provides an overview about the size of the different sectors. 34.7% of all new entrants in 2016 opted for IVET, which is also seen as part of secondary education area, 25.4 % entered in a programme leading to a higher education entrance qualification, 25.2% started in a higher education programme. The numbers are independent from age or an age cohort, but cover all entrants in a year.

The numbers of entrants to advanced vocational programmes (i.e. HVET) are not included in the integrated education report system (iABE), since these programmes require a previously acquired VET qualification and therefore don't follow directly the secondary school sector.

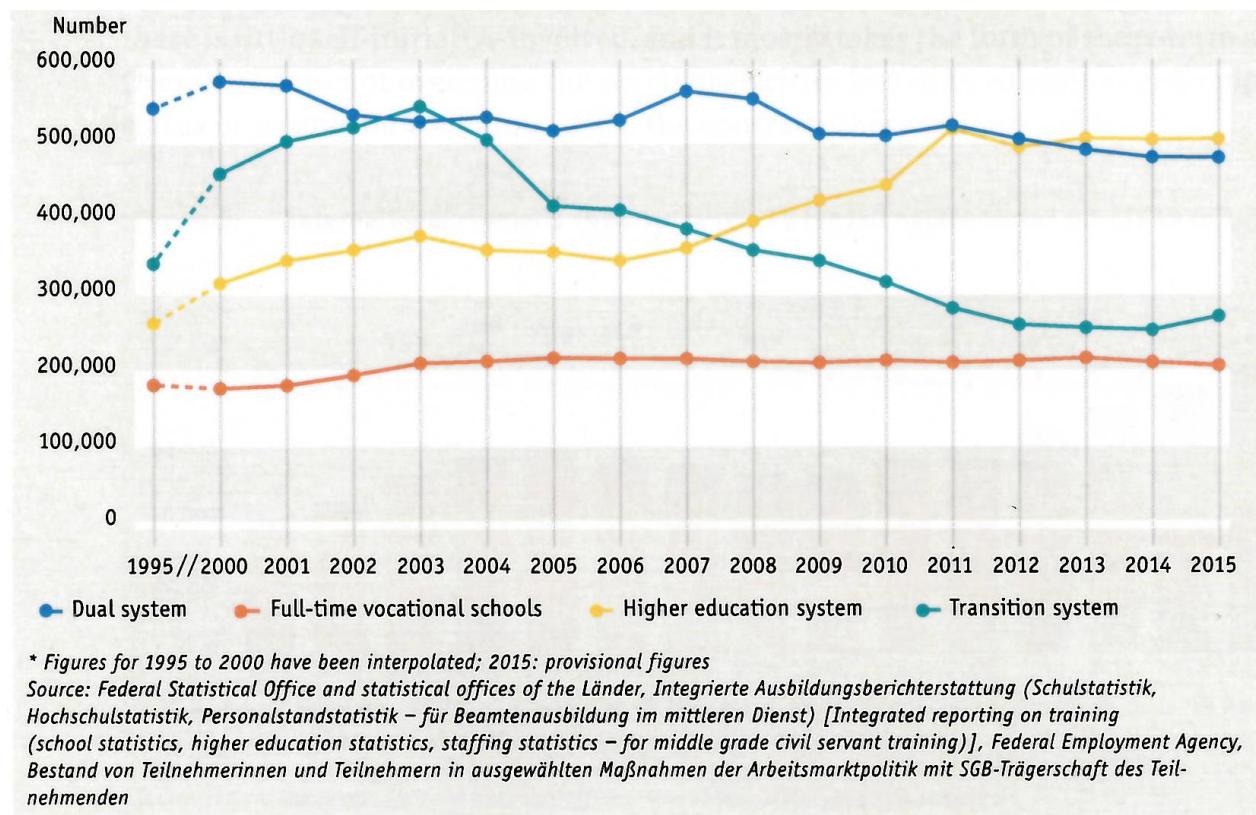
Figure 1: Development of the education sectors 2005 to 2016, in numbers and rate



Source: BIBB Datenreport 2017, p. 97; from left to right: IVET (medium blue: dual system VET; dark medium blue: VET in fulltime school i.e. social and health occupations; dark blue: others), Transition programmes, e.g. VET preparation (green), Acquisition of higher entrance qualification (yellow), New entrants in Higher education (light blue) from 2005 to 2016

From 2013 on the number of new students in higher education was higher than the number of young people entering the dual system of vocational education and training. This was the result of the rising number of people qualified to enter higher education and the slight increase the percentage of people transferring to higher education as well as the increase on the number of international students, see Figure 2.

Figure 2: Number of new entrants in different sectors of education 1995 to 2015*



Source: Authoring Group Educational Reporting, 2016, p.9.

The **tertiary education sector** comprises two different main pillars that provide various options of permeability, i.e. higher vocational education and higher education.

2.1 Advanced vocational education

Besides higher education programmes there are advanced vocational education programmes in tertiary education that are leading to a nationwide recognised vocational qualification on higher qualification level (EQF levels 5 to 7), i.e. 'Meister', 'Techniker' or 'Fachwirt'-qualification. These federally-regulated advanced training regulations do not contain a curriculum - unlike the training regulations for IVET in the dual system - but they are defining and describing examinations.

Table 1 Structure of the German Qualifications Framework on levels 5 to 7

Level 7	Master of Science M.Sc. Advanced vocational qualification
Level 6	Bachelor of Science Advanced vocational qualification (Fachschule): State-Certified Technician Advanced vocational qualification (state-recognised advanced training certification): Certified Master Craftsperson

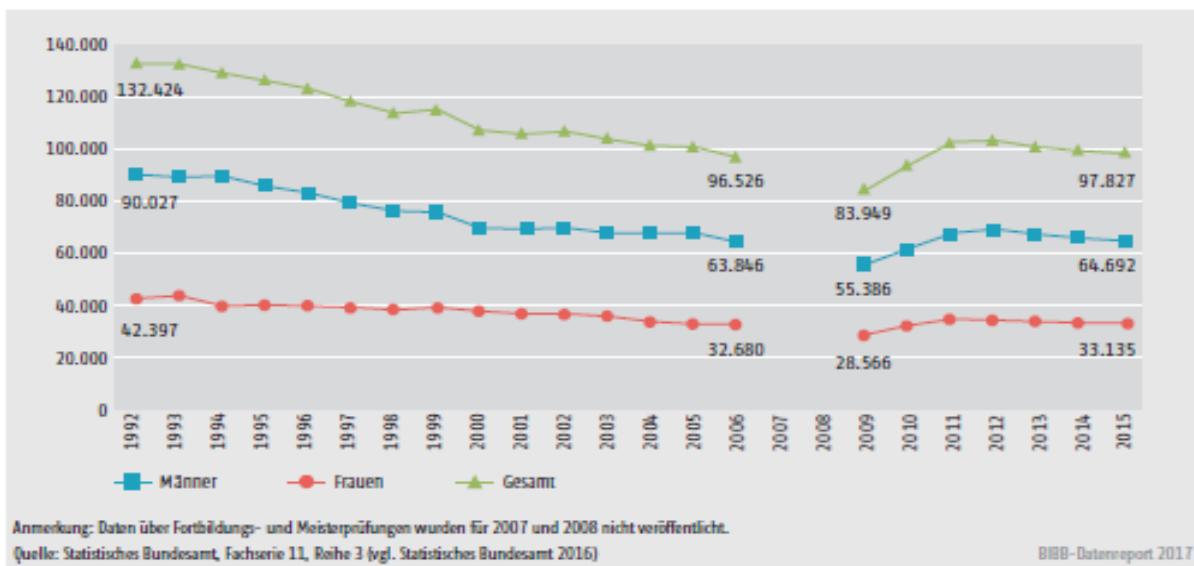
Level 5	Advanced vocational qualification
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Advanced vocational qualifications as a ‘Meister’ (Certified Master Craftsperson) entitles the holder to practice a craft trade independently and to employ and train apprentices and opens up access to courses at craft academies and UAS (Fachhochschulen) or even universities. The data about this programme are not fully recorded in the ISCED statistics for two reasons. First, the examinations basically don’t require a participation in a preparatory course. And secondly, even if a huge number of examinees participate in preparation classes, these courses often offered by the chambers are not seen as part of the education system. There is the political objective to change this insufficient visibility in international statistics and to include all programmes that meet the ISCED-2011 level definition in the next years. All qualifications in the area of advanced vocational education are allocated to the German qualification framework on levels 5 to 7. This is an important signal for the equivalence with academic degrees.

Figure 3below shows the development of passed **advanced vocational examinations**. There is a distinct decline in the annual number of advanced vocational examinations passed in the period from 1996 to 2006. The decrease is stronger for male graduates compared to female students. In the last years the decreasing development has stabilized. Since 2011 the number of passed examinations is constantly higher than in 2006, although since the peak in 2012 the number is again decreasing (BIBB, 2017b, pp.414).

In some cases, entire examination groups are affected by a discernible decline in numbers of examinations. This is the case for the Fachkaufmann/-frau (certified commercial specialist) and Fachkraft für Schreibtechnik (specialised office clerk) qualifications, among others. Examinations for the qualification of Fachkraft für Datenverarbeitung (specialised data processing clerk) have undergone a very marked decline in significance. An explanation might be that the jobs for which the qualifications prepare have undergone a severe change in the companies. Technological change and restructures in the work processes might have contributed to this development. In this respect the close relation between the area of advanced vocational education with the world of work becomes evident.

Figure 3: Development of passed examinations of advanced vocational education according to BBiG/HWO (legal basis), gender, total numbers.



Source: BIBB, 2017, p. 415. Blue: men, red: women, green: total

2.2 The trade and technical schools

The trade and technical schools regulated according to Länder law can be attended after having obtained an initial vocational qualification followed by practical experience in the occupation, or alternatively in some cases, after lengthy practical experience in the occupation or by demonstrating a subject-specific aptitude. The teaching programmes, which may be organised in full-time or part-time form, lead to a state vocational qualification in accordance with Länder law. The duration of school attendance is between one and three years for full-time courses. Trade and technical schools provide qualifications to assume more extensive responsibility and management functions in the workplace. They end with a final state examination under Länder law.

According to data from the Federal Statistical Office (Fachserie 11, Reihe 2 [technical volume 11, series 2] School statistics – vocational schools), in the 2009/2010 academic year, 936 trade and technical schools nationwide were established under the auspices of public providers, and were attended by some 118,000 persons in total.

As set out in the ‘Agreement on acquisition of the university of applied sciences entrance qualification on vocational training courses’ (KMK resolution of 05.06.1998 in the version currently in force), the university of applied sciences entrance qualification can also be acquired at trade and technical schools. This option is an important element of permeability in the education sector.

The trade and technical schools (and, in Bavaria, ‘specialised academies’) exist for the following occupational fields:

- agriculture
- design

- technology
- business
- social care.

The student numbers at **trade and technical schools** decreased slightly since school year 2014/15, compared to the continuous increase in the previous years, but remain generally stable. There is a different development re. gender. Looking closer at the data, they show an increase of female students, but a stronger decrease of male students, leading to a net decrease. The reason might be the occupations to which the programmes of the trade and technical school are leading. Pre-school pedagogy and social sector occupations form the area with the largest number of graduates in year 2015. It's a rate of approx. 38%, the number of graduates increased by 2.1% from 2014 to 2015. Traditionally in this sector the rate of female students is very high (80%) (BIBB, 2017, p. 412).

Figure 4: Development of the number of students at trade and technical schools 2008/2009 to 2015 /2016



Source: BIBB 2017, p. 411. Blue: male, yellow: female

2.3 Health sector schools

Furthermore, the two to three-year health sector schools are nationally considered to be tertiary, and by state regulation approximately two thirds of their contents are theoretical, while the other third is devoted to practical training in hospitals and other health care institutions. The reason for their assignment to ISCED level 65 (former 5B) is that ISCED 2 is not the only entrance requirement, but work experience and/or preceding vocational qualification is required, both of which are currently classified at level 35 (former 3B). In the national qualifications framework (DQR) the nurses' qualification is on level 4.

2.4 Higher education sector with Universities of applied sciences (Fachhochschulen, UAS), Vocational academies (Berufssakademien) and the Baden-Wuerttemberg Cooperative State University

In the last years the number of young people entering VET leading to initial vocational qualification continuously decreased whereas the number of new students in **higher education** (e.g. universities, UAS) was steadily increasing.

Table 2: Number of students in higher education institutions from 2014/15 to 2016/17

	2014/15	2015/16	2016/17
Universities	1.705.723	1.729.503	1.747.515
Universities of Applied Sciences	896.187	929.241	956.717
Universities of Teacher education	24.748	24.456	25.109
Universities of Arts	35.326	35.536	35.980
Universities of Theology	2.568	2.493	2.476
Universities of Administration	34.349	36.570	39.213

Source: Statistisches Bundesamt:

<https://www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/BildungForschungKultur/Hochschulen/Tabellen/StudierendeInsgesamtHochschularbeit.html>, accessed: 16.11.2017

Universities of applied sciences were introduced to Germany's higher education area in 1970/1971 as a new type of institution. They have an independent educational mandate that is characterised by a practical approach to teaching. This usually involves semesters of work experience and professors who have worked in the relevant profession outside of the university environment as well as having gained their academic qualifications. There is a large number of private institutions. The UAS are offering Bachelor and Master degrees, but no PhD programmes. In 2016/17 34% of all students in higher education institutions participated in an UAS programme, see table 1 above.

Universities of **cooperative education** (¹) were first established in Baden-Wuerttemberg in 1974 as a pilot project. They still exist in several Länder as state-run or state-accredited institutions. There are universities of cooperative education in Baden-Württemberg, Saxony and Thuringia as well as in Hesse, Lower Saxony, Saarland and Schleswig-Holstein, some are public some are

(¹) Or also called in ISCED classification 'Vocational Academies'.

private. The idea of a dual study programme was created by the universities of cooperative education. At the beginning there was not the objective to provide academic degrees, the focus was on providing a practice-related qualification on a higher level than the dual system in secondary education. But then the involved companies criticized that the certificate of the universities of cooperative education lack the formal equivalence to academic degrees. Since 2004, the Bachelor degree of the Universities of cooperative education is recognized as equivalent to university bachelor degrees (Ratermann 2015). The companies bear the costs of on-the-job training and pay the students a wage, which is also received during the theoretical part of the education at the study institution.

Baden-Wuerttemberg Cooperative State University (Duale Hochschule Baden-Württemberg / DHBW) was the first higher education institution in Germany which combined on-the-job training and academic studies and, therefore, achieves a close integration of theory and practice, both being components of cooperative education, i.e. dual study programmes, see below. The university developed from a vocational academy, founded in 1974, to a special University of applied Sciences and is the largest individual provider of dual study programmes. In 2009, the German Federal State of Baden-Wuerttemberg granted 'Berufsakademie Baden-Wuerttemberg' the legal status of a university. Further on, the corporate university status means the institution can grant academic degrees. One of the main innovations is the ability to implement cooperative research projects, thus tightening the bonds with the partner enterprises and institutions and bringing academic studies on a more up-to-date level. Throughout its nine locations and three campuses, the university offers a broad range of undergraduate study programmes in the field of business, engineering, and social work. All degree programmes are both nationally and internationally accredited. In addition, DHBW offers postgraduate degree programmes with integrated on-the-job training. The Baden-Wuerttemberg Cooperative State University is also offering PhD programmes and is part of the group of universities in table 1 above. DHBW still is offering only dual study programmes on bachelor level and practice integrated Master study programmes.

Public higher education institutions are run by the Länder. Because of this, the Länder provide the vast majority of their funding and largely decide on the allocation of resources.

Programme level - Dual study programmes

Dual study programmes combine a university course with practical training or work experience with an employer. Unlike part-time courses, in a dual programmes the employment and/or training element is an integral part of the course. A dual programme is defined as a course of study with integrated vocational training or periods of practical experience in a company. It differs from traditional courses of study in its increased practical orientation. Another key feature are the two learning locations: university and companies. Vocational practice and study are closely integrated with one another in terms of both organisation and curriculum. So far there are different models of dual study programmes with big differences how the correlation between the two learning sites is organized and how closely working and learning is linked.

A dual programme can incorporate training, work-experience or employment.

- A dual programme **with training component** (occupation integrated dual study programmes) combines a course of study with training in a recognised occupation. In addition to a degree, students obtain a vocational qualification. As a general rule, to enrol on a dual programme with training component a general university entrance qualification (Allgemeine Hochschulreife or Fachhochschulreife) and a contract of employment is required.
- Dual programmes **with a work experience component** combine a course of study with extended practical phases with an employer. Students obtain a university degree but not a recognised vocational qualification. As a general rule, to enrol on a dual study programme with a work experience component a general university entrance qualification (Allgemeine Hochschulreife or Fachhochschulreife) is required.

These two models of dual study programmes are regarded as initial study programmes.

- A dual programme **with employment component** (practice integrated dual study programmes) is primarily aimed at people who have already completed vocational or professional training and/or already have a number of years of professional experience. It is designed to offer further professional development and combines a course of study with professional experience that is directly relevant to the course. A general university entrance qualification (Allgemeine Hochschulreife or Fachhochschulreife) is no access requirement. The amount of time the student spends in the classroom and at the place of work is agreed in a contract between the institution, the student and the employer.

This model of dual study programme is regarded as continuing education.

The first common feature of all dual courses of study is that they are framed as an academic degree programme leading to a tertiary qualification – normally a Bachelor's degree. Some dual courses of study lead to the acquisition of other recognised qualifications from the vocational sector in addition to the higher education qualification, meaning that these educational formats confer double or multiple qualifications. The most familiar at the level of initial vocational training in Germany is the training-integrated format, in which a qualification in a recognised training occupation is acquired in addition to the Bachelor's degree. Typically the programme duration is longer than the university bachelor programmes, mostly four years.

Dual study programmes are offered in a wide range of sectors. Most of them in engineering (60%) in economics (34%), 12% in IT, Social sector, Kindergarten pedagogy and the health sector. This ranking doesn't correspond to the number of students in the specific programme sectors. 50% of the students participate in economic studies, in the field of engineering are approx. one third, followed by IT with approx. 10% and the others with 10%.

In the dual study programmes that combine a bachelor programme with IVET (integrated initial dual study programme) the different occupations are offered. The most popular is Industry Mechanics, Mechatronics, Information technology specialist, Industrial clerk etc.

The providers of the dual study programmes are mainly the Universities of Applied Sciences, The Duale Hochschule Baden-Württemberg (DHBW) and the Vocational Academies. The distribution shows the prominent role of the first three mentioned institutions.

Table 3: Distribution of students of initial dual study programmes on providers

Dual Study programmes	University of applied sciences	DHBW	Universities of cooperative education	Universities	other	total
public	28.780	33.326	7.411	1.182	1.823	72.522
private	18.535		6.373	2.279	1.300	28.217

Source: BIBB, 2017.

Despite the increasing number of students and programmes, see table 4 below, the rate of students participating in a dual study programmes is still comparatively small.

Table 4: Rate of students in dual study programmes related to students in total (first-study students) from 2006 to 2012, in %

	2006	2007	2008	2009	2010	2011	2012
Rate of students in dual study programmes	2.5	2.5	2.6	2.7	2.8	3.4	3.4

Source: Wissenschaftsrat 2013, p. 45

3. Change processes during the last 20 years - educational system perspective

3.1. Change processes and their impact on the system

The developments described in chapter 2 reflect a shift to higher education. But higher education means different kinds of programmes and there is a greater number of pathways to higher education entrance qualification.

- Additional access pathways to higher education

Developments in tertiary education are also reflections or consequences of developments in secondary education. Increasing numbers of graduates from secondary education with a higher education entrance qualification (HZB, *Hochschulzugangsberechtigung*) or changing access requirements in higher education have an impact on numbers of participants in tertiary education programmes.

Therefore the number of new students without a formal HZB is growing <http://www.studieren-ohne-abitur.de/web/information/daten-monitoring/quantitative-entwicklung-in-deutschland->

[insgesamt](#), accessed. The rate increased from 0.6% in 1997 to 2.6% in 2016 (In 2016 2.6% of all new students. Additionally to the traditional route via the Abitur, a HZB

can be acquired in schools, in some cases newly introduced, with several educational pathways or in vocational schools². Already about a third of young people gain HZBs at vocational schools. Furthermore, graduates from IVET in general have a limited HZB that opens access to occupation related HE programmes. Graduates from advanced vocational education acquire with their vocational qualification a general HZB that in general provides access to all undergraduate studies. However, the higher education institutions decide on individual access in the end.

Source: Authoring Group Educational Reporting, 2016, p. 12.

About one fifth of new students entering in higher education already have a vocational qualification additionally to their HZB. When having a vocational qualification at the beginning of a higher education study there is very often a high correlation between the vocational and the academic subject (Autorengruppe Bildungsberichterstattung, 2014).

- Dual Study programmes

In recent years the number of dual courses of study has risen sharply. At the same time, dual study models have evolved into increasingly diversified forms with marked structural differences from one another (Leichsenring, König et al. 2015). In many places, discussions as to what constitute the essential characteristics of a dual study programme are taking place without ever having agreed upon a universal definition. In autumn 2013 the German Science Council published its recommendations on the development of the dual degree programme ('Empfehlungen zur Entwicklung des dualen Studiums') and suggested some criteria. (Wissenschaftsrat 2013). In its recommendation it proposes that in dual study programmes at least half of the study programme should be spent at the academic learning venue and at least two thirds of the credit points should be acquired from theory-based work, but not necessarily at the higher education institution. Furthermore, it calls for at least organisational and/or scheduling coordination between the learning venues, and for the degree subject to be chosen for its affinity to the vocational training programme or job, in order to create content-based reference opportunities.

The area of dual study programmes increased regarding the number of programmes, the number of cooperating companies and students:

² Specialized or vocational Gymnasien, Fachoberschulen (specialized upper secondary schools) and Berufsoberschulen/technische Oberschulen (vocational/technical upper secondary schools), school-based vocational training (leading to dual qualifications).

Table 5: Development of cooperating companies and students in dual study programmes from 2004 to 2016

year	Number of programmes	Cooperating companies	students
2004	512	18,168	40,982
2006	608	22,003	43,536
2008	687	24,572	43,991
2010	776	27,900	50,764
2012*	910	45,630	64,093
2014*	1,505	41,466	94,723
2016*	1,592	47,458	100,739

*Numbers relate to the initial dual study programmes only, not to dual study programmes that are defined as CVET. The initial dual study programmes are programmes designed for graduates from secondary education in contrast to dual study programmes that are designed for people that are already working and very often continue working while studying, see above chapter 2.

Source: AusbildungsPlus, 2016.

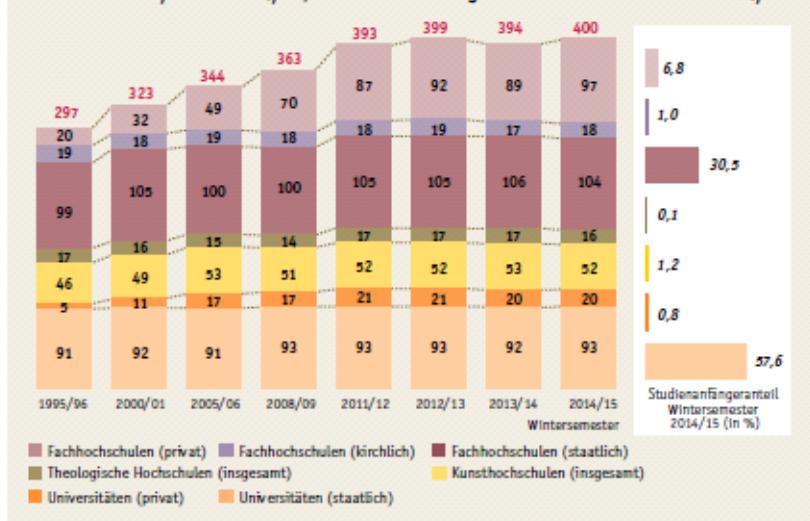
There is a remarkable increase from 2012 to 2014. The number of cooperating companies has more than doubled since 2004, similar to the growth of the student number, where the number exceeded 100,000 in 2016.

- Growth of the University of applied science sector in general

Not only the numbers of dual study programmes and students are increasing, but the sector of Universities of applied sciences in general. This is important to recognize, because these programmes are in general more practice-oriented than university programmes. The figure below shows that the sub-sector that leads to a statistical increase of higher education are the universities of applied sciences. Therefore the interpretation of the growing number of higher education has to consider the growing area of practice-related programmes, a development which could be better categorized as a **vocationalisation of higher education** than academization of VET.

Figure 5: Number of higher education institutions according to type and funding (public vs. private) 1995/96 to 2014/15 and proportion of new students at each type of HE institution for 2014/15

Abb. F1-1: Zahl der Hochschulen* nach Hochschulart und Trägerschaft, Wintersemester 1995/96 bis 2014/15, und Studienanfängeranteil nach Hochschulart 2014/15



Source: Autorengruppe Bildungsberichterstattung (2016), p. 124.(light pink: private UAS, dark pink: public UAS, light orange: public universities, yellow: academies of arts)

In 2015 42% of all new higher education students went to Universities of applied sciences (Authoring Group Educational Reporting, 2016, p. 127).

In general it can be stated, that there have been no new subsectors in tertiary education developed in the last 20 years but there are changes in participation rates and numbers as mentioned above.

3.2 Changes related to characteristics of 'VET at higher levels'

3.2.1 Changes related to governance and institutional structures of 'VET at higher levels'

In the area of the processes and governance structures haven't changed in the last 20 years.

Advanced vocational education is regulated within the scope of the legal bases mentioned (§ 53 BBiG, § 42 HwO) by advanced training regulations together with associated examination regulations, which are issued by a federal ministry, normally the Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung, BMBF). In the skilled crafts sector, responsibility for issuing training regulations at master craftsperson level (pursuant to § 45 HwO) rests with the Federal Ministry of Economics and Technology (Bundesministerium für Wirtschaft und Technologie, BMWi). Normally it is the employers' organisations and trade unions who initiate new advanced vocational training qualifications.

The legal base for advanced vocational examinations is the Vocational Training Act (§ 56 BBiG). Recommendations on the conduct of examinations by the competent bodies, i. e. mostly chambers, are laid down by the Board of the Federal Institute for Vocational Education and Training (Hauptausschuss des Bundesinstituts für Berufsbildung, HA BIBB), http://www.bibb.de/dokumente/pdf/ha-empfehlung_128_mpo_fortbildung_bbig.pdf (in German), accessed: 04.10.2017).

A total of 223 federally-regulated advanced training regulations were issued in 2016 (BIBB, 2017, p. 407). These advanced training regulations are nationally recognised and the examination regulations are also standardised throughout Germany.

According to the Vocational Training Act (§ 54 BBiG) and the Crafts and Trades Regulation Code (§ 42a HwO), the sectoral bodies responsible for training – mostly chambers – can pass examination regulations for advanced vocational qualifications, which are known as **chamber regulations** (Kammerregelungen). Examples of competent bodies are the IHKs (chambers of industry and commerce) and the HWKs (chambers of crafts and trades) as set out in the Vocational Training Act, § 71 ff. BBiG. They make active use of these powers. In 2016, 2,598 legal regulations are issued by individual chambers on 755 advanced training occupations which they were responsible for regulating (BIBB, 2017, p. 407). These examination regulations are valid only in the issuing chamber's particular districts. For example, the qualification of Fachkraft für regenerative Energietechnik (regenerative energy technology specialist) exists in only four out of the total of 53 chamber districts. These qualifications are currently not represented in the international education statistics. This will be changed in the next years.

The initiative for the development of advanced vocational training regulations originates largely from the top-level employers' organisation and the confederation of trade unions. In 2008 the top-level organisations of industry, represented by the German Employers' Organisation for Vocational and Further Training (KWB, membership of which includes inter alia the top-level chamber organisations ZDH and DIHK) along with the Confederation of German Trade Unions (DGB), concluded an agreement on advanced vocational training, in which they reached a consensus on the criteria and procedures to which advanced training regulations of the competent bodies and the German federal government should generally conform (DBG and KWB, 2008).

In their role as private enterprises the chambers play an important role as providers of preparation courses for the advanced vocational examination. The Chambers of Industry and Commerce as well as the Chamber of Crafts and Trade have established numerous education and training centres. Additionally, there are other private providers of preparation course as well as public schools, mainly the trade and technical schools, that also offer courses. All providers charge fees for the courses.

For the examination the competent bodies establish boards of examiners. The membership of the board of examiners must include delegates of the employers and the employees in equal numbers, and at least one teacher from a vocational school (§ 40 BBiG). The members must have expert knowledge of the areas to be examined. The contents of the examination are set out in the federally-regulated advanced vocational training regulations or the advanced vocational examination regulations.

In the area of **trade and technical schools** the processes and governance structures also haven't changed in the last 20 years. For the trade and technical schools, the curricula development lies in the jurisdiction of the Länder. In order to achieve nationwide recognition and a common classification system for training provision, the 16 Länder reach consensus within the Standing Conference of Ministers of Education and Cultural Affairs of the Länder (KMK) and set

it down in the 'Framework agreement on the trade and technical schools'³. This contains some basic statements on the agreement reached with regard to objectives, qualifications, admission requirements and forms of organisation.

Trade and technical schools are institutions of continuing vocational education and training. The training courses in the subject areas follow on from an initial vocational qualification and subsequent occupational experience. Following a teaching programme (which may be organised in full-time or part-time form), they lead to a state postsecondary vocational qualification in accordance with Land law. Furthermore, they may offer supplementary/extension training courses and updating training programmes.

Trade and technical schools provide qualifications for the assumption of management functions and support preparation for self-employment.

Dual study programmes were created as a form of educational provision offering both an academic and a practical vocational qualification. The coupling of competence acquisition in both higher education and practical company-based contexts is aimed at supporting learning transfer and hence achieving a benefit over purely academic or purely hands-on forms of initial vocational training.

The role of the companies differs in the different dual study programmes. In some study programmes, e.g. the universities of cooperative education, the employers or specific large employers play a crucial role in the process of curricula development, in some cases they contribute to funding.

As they are part of the higher education area, the programmes have to be accredited. The accreditation of study programmes resp. of internal quality assurance systems of higher education institutions is carried out by accreditation agencies, who in turn are accredited by the Accreditation Council of the Foundation for the Accreditation of Study Programmes. The legal basis of the accreditation system is set out in the Accreditation Foundation Law as well as in the contracts concluded between the Foundation and the agencies and defining the rights and obligations of the partner institutions involved in the accreditation system.

For the occupation integrated programmes there is a specific constellation of stakeholders, because additionally to the companies and the higher education institution there are the VET schools involved, i.e. the same VET school like in IVET (apprenticeship system, Duales System), because these programmes lead to a Bachelor degree but also to a full vocational qualification. In practice this means for the students that they have in fact three learning venues.

The other programmes provided by the UAS are also practice and applied oriented, some require practice experience in internships of four to six months per bachelor programme, but the two learning venues and learning phases are not as continuously merged and linked as during the dual study programmes. During the practice phase, the students acquire credit points. Typically, a bachelor programme at a UAS is one or in some cases two semester longer than at universities, especially when there is a specific practice semester integrated in the programme.

³ Framework agreement on trade and technical schools' (Rahmenvereinbarung über Fachschulen), KMK resolution of 07.11.2002 as last amended on 03.03.2010

The role and commitment of the companies is not as intense as in the dual study programmes, but traditionally the UAS are very much related to the regional economy and labour market. The learning groups are smaller compared to universities, which is an additional important asset for the students.

The main sectors of UAS programmes are economics, engineering as well as the health and social sector. Furthermore they offer programmes in economic law, social work or design.

The most relevant aspect re. UAS, however, is the development of the dual study programmes, as above.

Financial support for people in initial and continuing vocational education and training in Germany is governed by three statutory bases: the Federal Education and Training Assistance Act (Bundesausbildungsförderungsgesetz, BAföG), the Upgrading Training Assistance Act (Aufstiegsfortbildungsförderungsgesetz, AFBG) and the Third Book of the Social Code (Sozialgesetzbuch III, SGB III) in which the vocational training grant scheme (Berufsausbildungsbeihilfe, BAB) is regulated.

Their respective scopes of application divide up broadly as follows: wholly school-based and university-based IVET is supported under the Federal Education and Training Assistance Act (BAföG), in-company IVET under the vocational training grant scheme (BAB), and recognized upgrading training, for which a recognized initial occupational qualification or equivalent is a prerequisite, under the Upgrading Training Assistance Act (AFBG). The AFBG is used to fund the costs of training courses, examinations and the skilled-craft masterpiece (all independent of income and assets) and – for full-time courses – to contribute to maintenance (depending on income and assets), partly as a grant and partly as a loan.

Generally, the AFBG relates to federally-regulated advanced vocational training and chamber-regulated training while the BAföG relates to school-based and academic education and training. Learners at trade and technical schools, who must meet the prerequisite of holding an initial qualification in a recognized occupation, can claim payments under either the BAföG or the AFBG. In the academic sector, the BAföG is applicable.

3.2.2 Changes related to the target groups of 'VET at higher levels'

The goal of **advanced vocational education** is to extend occupational proficiency and obtain career promotion (§1 para. 4 BBiG). Advanced vocational education as a 'Meister' entitles the holder to practise a craft trade independently and to employ and train apprentices and opens up access to courses at craft academies and universities of applied sciences or even universities.

The reform of the Vocational Training Act in 2005 introduced a modification of the concept of occupational proficiency. Under the old version, this had to be installed by teaching the necessary occupational skills and knowledge in the course of vocational education and training (VET). In the reformed version of 2005, this definition was augmented with the dimension of 'capabilities'. It now states that the "necessary occupational skills, knowledge and capabilities (occupational action competence)" must be taught. This new definition is indicative of a greater

emphasis on competence-orientation in VET in general, an orientation that is increasingly being taken up in the stipulations of regulatory policy.

Other aspects which must be specified in the advanced training regulations are (§ 53 para. 2 BBiG, § 42 para. 2 HwO):

- designation of the advanced qualification,
- aim, contents and requirements of the examination,
- admission requirements and
- examination procedure.

To be admitted to an examination, a completed course of vocational training and/or appropriate vocational experience is generally required. These regulations are laid down by the BMBF by agreement with the competent ministries and following consultation with the Main Board (Hauptausschuss) of the BIBB. In the regulations that have been updated in the last years, the access has been explicitly opened to university graduates with related work experience. An IVET qualification is no longer a prerequisite for the advanced vocational examination. This is a signal for permeability between higher education and higher VET and a good example for its mutuality.

Access requirements and target groups of the **trade and technical schools** are similar to advanced vocational education. The participants have a VET qualification and mostly several years work experience.

Trade and technical schools exist for the following occupational fields: Agriculture, Design, Technology, Business, Social care.

Due to the fact that demand for training provision in the CVET sector can be highly specialised and fine-tuned, occupational fields are internally differentiated into 'specialisations' (Fachrichtungen), which can be further subdivided into "specific focuses" (Schwerpunkte) to take account of special regional requirements. Trade and technical schools are offering around 170 specialisations.

Dual study programmes were created as a form of educational provision offering both an academic and a practical vocational qualification. The coupling of competence acquisition in both higher education and practical company-based contexts is aimed at supporting learning transfer and hence achieving a benefit over purely academic or purely hands-on forms of initial vocational training. There is, however, a lack of clear criteria for describing this duality.

Depending on the type of dual study programme, the students have a specific contract with a company as well as the education institution.

In general, students have to apply for occupation integrated study programmes to the company, whereas the education institution decide on the application for practice integrated study programmes. To get access to an occupation integrated study programme the student needs to have a contract with a company first before applying to the higher education institution, they select the students. Furthermore access requirement is a higher education entrance qualification (Hochschulreife), a subject-specific certificate confirming such a standard (fachgebundenes Abitur), or a certificate confirming the academic standard required for entrance to a UAS (Fachhochschulreife).

Target groups for the other **UAS programmes** are similar to the dual study programmes. There is only one difference regarding the access requirement, that mostly access to a dual study programmes requires a specific study contract with a company. This is not the case in the other programmes.

3.2.3 Changes related to the main purposes and functions of 'VET at higher levels'

The goal of **advanced vocational education** is to extend occupational proficiency and obtain career promotion (§1 para. 4 BBiG). Advanced vocational education as a 'Meister' entitles the holder to practice a craft trade independently and to employ and train apprentices and opens up access to courses at craft academies and universities of applied sciences or even universities. The graduates are prepared for the intermediate company level jobs.

The trade and technical schools provide qualifications to assume more extensive responsibility and management functions in the workplace. At some specific trade and technical schools also a Meister qualification can be acquired with the above described consequences.

One important reason for the commitment of companies in the **dual study programmes** are the changing skill needs of the companies driven by changing technology and work processes or the increasing difficulty to find adequate apprentices for the dual system in secondary education. The companies communicate their difficulty to find apprentices with an adequate previous general education level, e.g. in the banking sector (Sirikit, 2015, p. 73). In general, the graduates from dual study programmes are prepared for intermediate level jobs in the companies. The bachelor graduates from the other **UAS programmes** focus on the same occupational status and job level.

3.2.4 Changes related to the perception of 'VET at higher levels'

The qualifications in the area of **advanced vocational education** and the trade and technical schools are allocated to the German qualifications framework on levels 5 to 7. This is an important signal for the equivalence with academic degrees, additionally because the German qualifications framework has a comprehensive structure, including VET as well as general and academic qualifications. But the German qualifications framework is strictly considered as an instrument for transparency, so it doesn't provide any individual access rights or rights to be allocated to a specific wage group defined in the collective agreements.

The attractiveness of the **dual study programmes** for initial students mainly comes from the perception of a good transition from the education to the labour market and the chance to learn in a practice oriented or applied way. The work experience during the programme and integration in work processes in the company seems to be a perfect basis for a subsequent job. Furthermore, the bachelor programme is at least co-financed or even fully financed by the companies and it provides the option to proceed to a master study programme. Additionally, the students get wages, similar to dual system-apprentices in secondary education or even higher.

For most of the involved companies the dual study programmes serve a recruitment instrument, for some it is in the meantime even the only recruitment source for jobs on the intermediate company level. The advantage for the companies is that they avoid periods of integration and insecurity about the competence of newly employed skilled labour. Additionally, via their cooperation with the partner education institutions they facilitate a transfer between research and practice (Berthold et al., 2009; Heidemann, 2011).

The attractiveness of **university bachelor graduates** especially in research connected study courses for the companies is lower compared to bachelor graduates from UAS. In general they miss the practice orientation and work experience compared to UAS bachelor graduates or advanced qualified workers on one hand and the lack of academic level compared to master programme graduates.(Bergs and Konegen-Grenier, 2005)

There are different signals re. the relation between UAS-bachelors degree graduates and advanced vocational qualified skilled employees. In Germany there is no significant tendency that bachelors would replace vocational qualified work force (Hippach-Schneider et al. 2013; Sirikit, 2015). The companies prefer to use the learning outcomes of **both** groups. (Werner et al., 2008). A study from 2016 shows that neither HE graduates nor graduates from advanced vocational education have consistently better income or labour market chances. Both groups are very heterogeneous, there are big differences regarding employment situation and career perspectives between economic sectors, occupational sectors, branches and job areas. It is stated that in general they are not equal but have the same value.(Flake et al., 2016).

Employees with advanced vocational qualification have in average a different kind of job to academic graduates and are often working in different sections in the company. But these differences do not automatically mean different career levels. A majority of companies regard the career chances of vocationally qualified employees as equal to the Bachelor graduates in the company.

4. Impact on content and delivery of qualifications and programmes - the epistemological or pedagogical perspective

4.1 Changes in relation to content and profile

Advanced vocational education is part of the vocational pathway on tertiary education level. It provides occupation specific upskilling but also new competences e.g. they are considered as preparation to set up a business. They provide entrepreneurial knowledge and skills. Therefore, most graduates have an IVET qualification in a corresponding occupation and/or several years of occupation related work experience.

The teaching is divided in an occupation specific part and the interdisciplinary part. The objective of the interdisciplinary part is to stimulate methodological, personal, social and learning competences. The objective of the occupation specific subjects is to promote a wider occupational action competence. Complex exercises that are developed out of the future work area facilitate the learning process. (Kultusministerkonferenz 2002)

UAS are institutions that provide **programmes** on an academic basis combined with practice orientation. Compared to universities the focus on teaching applied competences plays a larger role. (Wissenschaftsrat 2010). During the internships the students try to deepen or enlarge their theoretical knowledge.

This linkage is much more important in **dual study programmes**. The phases in the companies and practice of the initial dual study programmes are regarded as learning phases in contrast to the work integrated dual study programmes for people with work experience, see above. There are different models of how the learning in the two sites are organized, see below.

This organized connection between the two learning site provide the possibility of applying knowledge straight away and developing practical skills.

Re. Trade and technical schools and UAS there are no applicable changes to be identified.

4.2 Changes in relation to the delivery

Advanced vocational education

Preparation courses for the examinations are not compulsory. Mostly they are offered in part time, which provides the opportunity to work and learn at the same time.

Normally the teachers and tutors involved in preparation courses are equipped with a relevant initial vocational qualification in a recognised occupation and longstanding occupational experience. Frequently they had already been appointed members of boards of examiners. However, there are no uniformly defined standards.

Trade and technical schools

The programmes may be organised in full-time or part-time form. The duration of school attendance is between one and three years for full-time courses.

The educational mission of vocational schools, and hence of trade and technical schools, is characterised by a particular combination of vocational and general education, developing personal qualities and building proficiency for employment, developing competence and acquiring qualifications (Bader, 2008). This mission has a reciprocal interaction with the qualifications of teaching staff, which span a range of requirements from 'expert in occupational know-how' to 'educator'. Fulfilling these requirements is a particular challenge for teaching staff.

Two types of teachers can be distinguished at vocational schools: firstly, academically-qualified teachers trained at universities, known as 'Lehrer für Fachpraxis' (teachers of vocational practice). Teachers with a university degree normally have senior civil servant status. Teacher training consists of two phases: university studies in the different vocational fields of specialisation at Master's degree level, and a subsequent period of preparatory service, after which the Second State Examination must be taken. In practical subject areas, Fachlehrer (technical teachers) are also employed. Technical teachers do not need a university degree but have, instead, a relevant professional background, a master/foreman/certified supervisor, technical engineer or equivalent qualification, and formal training in educational practice.

UAS and dual study programmes

Professors teaching at **universities of applied sciences** have usually worked in the relevant profession outside of the university environment as well as having gained their academic qualifications. There is a variety of programme structures, requiring practice phases of different duration, full-time or part-time, some are offering distance-learning modules, especially for students that are working (⁴).

Dual study programmes lead to an academic degree and some of them to an additional qualification from the vocational education sector. In the evaluation of the AusbildungPlus database of these data in 2013, the preponderant structure in the initial vocational training sector, accounting for more than two thirds of courses, was the block model, in which the higher-education based and in-company phases are approximately the same length, rotating within the semester. In other courses of study, the practice phases always take place in the lecture-free period at the end of a semester (Leichsenring et al., 2015, p. 35). A special form of the block model is the semi-separated model with a preceding initial vocational training phase. In this case, training begins between 6 and 18 months before the study programme so that the bulk of the initial vocational qualification has been completed prior to starting the degree programme. These models with a preparatory phase of the initial vocational training frequently last considerably longer than three years; up to five years in individual cases (Leichsenring et al., 2015). Other models shuttle between the higher education institution and the practice establishment within a working week (rotation model) or work with self-study and distance-tuition elements so as to increase the frequency or number of days spent in the practice establishment.

Typically, a bachelor programme in a dual study programme is four years, at a UAS the duration of a Bachelor programme is one or in some cases two semester longer than at universities, especially when there is a specific practice semester integrated in the programme.

Teachers in dual study programmes, i.e. UAS and Universities of cooperative education need specific qualifications. Besides the scientific expertise as a higher education professor, they have to have several years of related practice experience outside the higher education institution.

The German Science Council (*Wissenschaftsrat*) recommends a rate of 60% of full-time higher education professors and 40% lecturers with a specific contract from practice. For UAS generally they recommend a rate of 80% full-time higher education professors and 20 % practice lecturers. (Wissenschaftsrat 2013). In order to meet the scientific level of the institutions as higher education institutions the lecturers from practice, very often from the cooperating companies, should have equivalent qualifications to the full-time education professors.

In 2016, the German Science Council recommended to increase the attractiveness and to strengthen the **UAS teacher careers** in order to attract more applicants from Germany but also from abroad. The challenge is that researchers from universities lack the practical work experience and for successfully integrated researcher there often is a lack of incentives to go back to a higher education institution. The traditional career pathway should be complemented by newly created qualification models. There is a need for UAS teachers especially in the fields of engineering and economics but also in health and nursing science. Nevertheless, the double qualifications of the UAS teachers should remain an essential feature. According to a group of

(⁴) See <https://www.fachhochschule.de/>, accessed 16.10.2017.

UAS a new educational pathway should make it easier to acquire both qualifications, academic grade and practice experience, e.g. by a new form of PhD-Programme a so-called Tenure Track. This model means that future researchers would work for at least three years after their PhD or post-Doc in a company on a beforehand agreed and reviewed research project. (Hochschulallianz für den Mittelstand 2016)

Furthermore an additional funding should promote the recruitment of new UAS teachers.

5. The context of change: rationale and drivers for change or persistence

In the context of the OECD-publication 2017 the German Minister for education and research pointed out that the employability rate of young adult with an initial vocational qualification (86%) is almost as high as the one of young adults with a tertiary qualification (87%). Additionally, more and more young people start a tertiary education programme, be it a higher education programme or a programme leading to an advanced vocational qualification i. e. '**Meister**' or '**Techniker**' qualification. In the period from 2005 to 2015 the rate of new entrants in any kind of tertiary education programme increased from 43 to 63% (BMBF, 2017).

This statement reflects that in the meantime the term 'tertiary' is no longer used as an equivalent to higher education. Vocational education finally is also noticed as an important pillar in tertiary education and no longer seen as (only) part of secondary education.

The Main Board at BIBB, where representatives of the four stakeholder groups are represented and that is the 'voice' of VET policy in Germany ⁽⁵⁾, stated in an official legal document from 2014 that the federally regulated **advanced vocational education** provides equivalent options for professional development compared to higher education. From its point of view advanced vocational education becomes more and more relevant due to demographic development, longer active working life, technological development, in order to provide employees with latest professional knowledge and skills. In their view the need for vocationally high skilled people is growing. Competitiveness of industry and economy as well as individual employability requires a strong system of advanced vocational education (Bundesanzeiger, 2014).

A study from 2016 shows that graduates from advanced vocational education have a clear advantage compared to IVET graduates and enter income areas of academic graduates. Enterprises appreciate and value the competences of these employees. Many companies pay comparable wages like for academic graduates, but there are different factors relevant like professional sector or concrete job (Flake, Werner et al. 2016). Regarding advanced vocational qualifications in the management sector for instance, they show that more than 60% of the asked companies pay almost the same wages for graduates of this advanced vocational education compared to bachelor graduates; both at the beginning of the contract and after 5 years of work. In about one quarter of the companies, wages of advanced vocational qualified employees are slightly lower directly after recruitment, the difference diminishes during the subsequent years of work. At the same time the rate of companies where advanced vocational qualified employees get higher wages even in the first five years is increasing from 12.2% to

⁽⁵⁾ Federal government, Länder governments, employers' associations and trade unions

20.4 %. They state a clear tendency towards the employees with this higher vocational qualification.

Nevertheless, the growing number of study programmes and students in the sector of **Universities of applied sciences** in general and the increasing attractiveness of **dual study programmes** for initial students but also for working people have put a pressure on the advanced vocational education sector in the previous years. It becomes more relevant to make this option visible and show the benefit for career development. One consequence is the idea of developing a brand for VET on higher education levels (see Section 7).

6. Zooming in on nursing and engineering

- *Nursing*

Formally Nursing is not part of the dual system of apprenticeships in secondary education, but is an occupation regulated by Länder law. But in fact, the education and training is very much work-based organized with long periods of learning in hospitals or other institution of health and care. In most cases nurses start to learn the profession in a special nursing school that is mostly connected to a hospital. Before starting the school they need a few weeks of practical training in a hospital setting. The nursing course is done according to EU regulations and is three years long including around 2,100 hours for theoretical knowledge and 2,500 hours of practical training in different hospital settings. In the first year of education, nurses are paid about 750-800 € a month. In the second year of education, nurses are paid about 800-900 Euro a month. In the third and last year of education, nurses are paid about 930-1,030 € a month.

Since 2004, there is the possibility to study nursing on a B.Sc. base (mostly in universities of applied sciences). This is a possibility for further education and specialization. These study programmes are not an alternative for the nursing qualification programmes, described above and therefore cannot be qualified as an 'academic drift', but they provide further career prospects. So the graduates still need the official state exam to get the registration as nurse. Some universities offer a special program with local nursing schools where students learn in school and university to get the B.Sc. and state registration. Some universities offer post-graduate studies leading to a master's degree and the possibility to continue studies for a Ph.D. degree.

This 'upgrading' approach should contribute to changing demands in the work place and increase attractiveness of this profession by providing career perspectives in education and on the labour market.

Beside the academic study there are different ways to specialize after the nursing schools, called 'Fachweiterbildung'. Salaries are typically higher with a 'Fachweiterbildung'. Specialization includes some 720–800 hours of theoretical education and practical training. In the end, there is a state exam or writing of a thesis.

- *Engineering*

Engineering is a professional area that is strongly represented both in advanced vocational education and training as well as in dual study programmes. It is traditionally very much practice oriented. There are no special aspects for engineering studies compared to other study areas.

7. Current debates and future perspectives

The shift to higher education institutions

The shift in the flow of school-leavers towards higher education has prompted public debate in Germany in the past few years to increasingly focus on the relationships between the VET pathway and higher education. There is need to continue to make the necessary differentiations in this context and to investigate whether and to what extent new lines of segmentation and social disparities are emerging in relation to VET and higher education. It will have to be clarified what consequences this trend has both for both educational areas (Authoring Group Educational Reporting, 2016).

Structure and organization of dual study programmes

‘Dual study programme’ is a term that covers different kinds of study programmes that combine theoretical and practical learning. In some cases, though there even is no link between the job and the study at the higher education institution, but still the term ‘dual study programme’ is used. In its recommendation on the development of the dual study programme, the German Science Council (Wissenschaftsrat, 2013, p. 28) therefore proposes that in dual study programmes at least half of the study programme should be spent at the academic learning venue and at least two thirds of the credit points should be acquired from theory-based work, but not necessarily at the higher education institution. Furthermore, it calls for at least organisational and/or scheduling coordination between the learning venues, and for the degree subject to be chosen for its affinity to the vocational training programme or job, in order to create content-based reference opportunities. (⁶)

Development of a brand ‘Higher VET’ (‘Höhere Berufsbildung’)

In order to make the **advanced vocational education** more visible an initiative, strongly supported by the chambers, was started to establish a brand and intensify the public communication about this traditional vocational pathway. Attractiveness and career chances should be emphasized as well as the parity of esteem with higher education (Source: Interview 2). To create a brand “Höhere Berufsbildung” is also suggested in a study of an institute related to the German industry (Flake, Werner et al. 2016).

8. Overview

Table 6 **Overview**

(⁶) Leichsenring, <https://www.bibb.de/en/29035.php>, accessed: 02.10.2017.

Direction of change	Object of change	Context/target area	Key processes observed / results	Timeframe	Section
Academic drift	Higher Education	professionally-oriented HE	Number of UAS students and programmes is increasing (⁷)	During the last 20 years	2
		traditional (or academic) HE programmes	Number of HE students is growing	During the last 20 years	2
	VET (outside HE)	VET transformed to HE	Introduction of Bachelor study programmes for nurses as further specialisation.	2004	6
		VET offered at higher levels outside HE	The number of participants in advanced higher education is decreased	From 2007 to 2009	2
Vocational drift	Higher Education	professionally oriented HE	Strong increase of number and participants in dual study programmes	Since 2004	2
		traditional (or academic) HE programmes			
Expansion of VET at higher levels (outside HE)	VET at higher levels (or 'higher VET') offered outside HE		The number of participants in advanced higher education is stable	Since 2014	2

(⁷) This is considered as academic drift because the programmes are also academic and therefore part of the statistics that show the increase of numbers of students. When looking at the HE sector in general, this process could be considered as vocational drift of HE since the sub-sector of UAS is the growing area.

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