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Ideas of Dual Higher Education in Germany

focused on Best Practise in the Federal State of Baden-Württemberg

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Abstract	This report introduces the European Framework for Dual Higher Education and illustrates the varieties of Dual HE in Germany, particularly the model of the Cooperative State University of Baden-Wuerttemberg (DHBW). The aim is to facilitate the analysis of best practises and comparative study of status in the field of Dual Higher Education.

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Content

Abbreviations

CAS	DHBW Center of Advanced Studies
DHBW	Duale Hochschule Baden-Württemberg (Cooperative State University Baden-Wuerttemberg), Germany
DHE	Dual Higher Education
ECTS	European Credit Transfer and Accumulation System
EQF	European Qualifications Framework
FHJ	Fachhochschule Johanneum, Austria
HE	Higher Education
HEI	Higher Education Institution
HVET	Higher Vocational Education and Training
LO	Learning Outcome
PHE	Professional Higher Education
VET	Vocational Education and Training

1. Introduction

The idea of cooperative education with shared responsibilities between educational institutions and the world of work has a longstanding tradition in some European regions, reaching back to medieval times. Based on some of those proved concepts, the tertiary education sector developed the idea of Dual Higher Education. Several models evolved over time and thus, Europe is an appropriate place to scout for ideas of Professional Higher Education, their policy and quality frameworks as well as their curricular programmes and their learning schedule models.
This report firstly aims for giving an overview on nowadays settings for European Dual Higher Education. Secondly, the prevailing concepts of German Cooperative Study courses are outlined, offering a wide field of observation due to the Federal structure, assigning responsibility for education to the respective Federal State. Thirdly, this document narrows down to some examples of best practice in Germany, focusing on the model of Cooperative State University of Baden-Wuerttemberg (DHBW). In this last chapter, the policy base as well as organizational structures and quality requirements are outlined for the Dual Bachelor Study as well as for Dual Master Study courses, providing a perspective for further education and life long learning.

In addition to this report, DHBW provided for an Online Seminar (10/11/2020) dedicated to partners of DIARKAZ and DualSCI. All slides, documents and a summary are made available to partners online.

2. European Background

Developments in Europe regarding Higher Education (HE) result in various convergent as well as divergent processes, which have an influence on what is perceived as professional versus academic higher education. For one thing, an 'academic drift' pushed many 'non-academic' institutions to profile themselves as almost being equivalent to the traditional universities, often quite successfully, e.g. German Universities of Applied Sciences (Fachhochschule). On the other hand, the explosion of the technological and commercial sectors dating back to as far as the nineteen seventies, in combination with a rise of income for middle class families, led to a steep rise of student numbers, which needed education and training. In Western Europe, this was the chance for the newly established polytechnic type of institutions, some of them already recognized as new ('red-brick') universities by local authorities, e.g. the United Kingdom).
Soon a rationale for such type of institutions was developed, in both government and employer's circles, based on the 'employability' factor: A skills-oriented training was seen as a guarantee of prospective careers in a well- defined job. This rationale has been upheld to date, although impeded by the recent economic and financial crisis. Academic programmes adopted this reasoning, which entailed a "vocational drift" becoming apparent in a large number of research oriented universities. Renewed National Qualification Frameworks have been developed and strengthened this process. Even highly academic programmes included practical elements into curricula and in the description of learning outcomes.

Nowadays, Professional Higher Education programmes are found in a variety of settings, which can be a) an individual institution providing professionally oriented programmes, or b) an affiliated or integrated element of a 'comprehensive institution', which offers vocational programmes next to academic ones. Different concepts of HE institutions co-exist in the academic range of institutions in Europe and, actually, also specialized 'dual learning' institutions, e.g. in several German Federal States, based on the model of the long-established vocational training system (VET).

After all, Professional HE is characterised by the fact that its education and certainly its study programmes are shaped by specific professional goals or needs, in which the contexts of the future professions are clear and the learning outcomes are defined by the professional needs, in terms of integrated competences (HAPHE Consortium, 2013).
Playing a considerable role as an intermediary between HE, VET and the labour market, PHE institutions have their roots in both, the academic and professional education. They are key actors in the process of a better co-operation and understanding between Higher Education and the world of work.

Against this background, it is important to elaborate and monitor multidimensional characteristics of Professional HE with appropriate quality indicators. The EU project HAPHE offers a definition and a comparative review of existing HE structures in European countries, also identifying problematic issues and weak points of present systems (http://www.eurashe.eu/projects/haphe/).

In Europe, a number of different types of work-based learning programmes can be determined. They have different advantages and disadvantages, depending on the perspective of stakeholders (learners, employers, educational institutions, governments). In general, work-based learning can be used to achieve a number of different objectives, such as:

• develop vocational skills that contribute to recognised vocational qualifications;

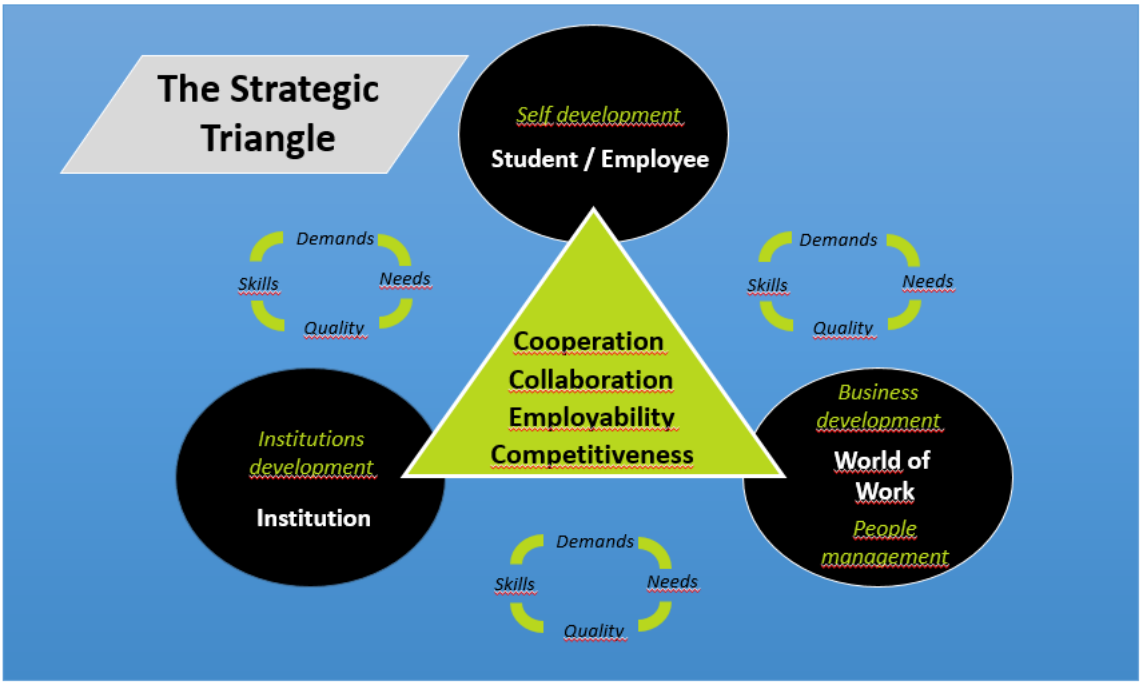
• develop general work habits and job-readiness;

• help students to understand what is involved in jobs so that they make better career choices;

• enable disadvantaged people and job seekers access to work-opportunities they might not have otherwise

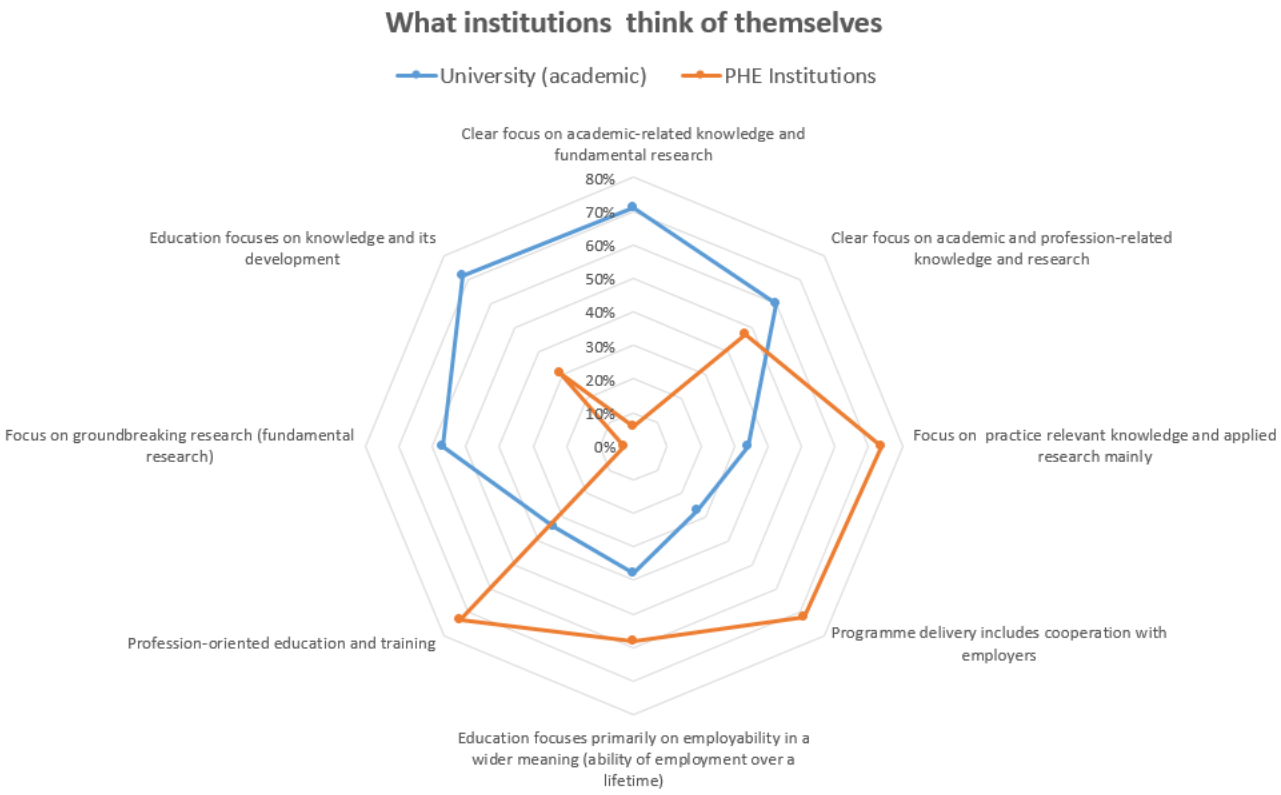
Its a key issue for policy makers and social partners, how to choose the adequate type of programme for the chosen purpose, while best meeting stakeholders' needs.
(Work-based learning: A handbook for policy makers and social partners in ETF partner countries, ETF 2014, https://www.etf.europa.eu/en/publications-and-resources/publications/work-based-learning-handbook-policy-makers-and-social)

The needs have to be specified for three main actors if the idea of work-based learning is transferred to Higher Education: the University, the student and the partner company or institution, offering the work place for learning. Professional HE is based on a strategic triangle:



For each development of new PHE study courses, concepts of collaboration of the main stakeholders have to be outlined.

Several common characteristics and challenges can be determined. Seen from the perspective of the HE institution, the HAPHE consortium summarized the situation in the following diagram (http://www.eurashe.eu/projects/haphe/) :



Looking at the situation in Kazakhstan, the challenges of modelling PHE as part of an academically oriented University could be:

- The mindset of general policies at Universities as well as in particular faculties
- Future strategies and focus of Universities A) in teaching B) in R&D?
- Connections, communication and integration with the World of Work
- Willingness to invest in cooperative education with company partners
- Flexibility in handling ideas of teaching and learning aiming for new types of study courses

Keeping this in mind, the European Dual Study Framework, created by HAPHE partners, provides for structural support for the development of PHE courses, based on the following definition:

"Dual studies are a form of **Professional** Higher Education that offer a particularly **intense integration** with the world of work in all its aspects, including teaching, learning, research, quality management and governance and at all levels of the overarching national Qualifications Framework and Policies in the respective countries." (adapted from HAPHE framework http://www.eurashe.eu/projects/haphe/).

The HAPHE consortium conducted quantitative and qualitative analyses in all three main stakeholder groups. As a result of the subsequent research and discussions **four dimensions for the Dual Study Framework** evolved (presented with their respective characteristics):

1. **Policy** and **Strategy :** *How is the Dual Study model embedded and represented in the overall policies and strategic framework of higher education institutions?*
   important characteristics:
   1.1. Policy and Strategy integration within the HE institution
   1.2. Objectives and outcomes of Dual Study programmes
   1.3. Regional integration

2. **Teaching** and **Learning :** *How is teaching and learning influenced through the specific characteristics of Dual Study?*
   important characteristics:
   2.1. Methods of curriculum development
   2.2. Learning outcomes = THE WHY
   2.3. Content for learning and teaching = THE WHAT
   2.4. Learning methodology = THE HOW
   2.5. Learning environment = THE WHERE

3. **Research, Development and Innovation (RDI) :** *How are RDI integrated as part of a sustainable Dual Study model at HE institutions, recognising that they might differ from level to level?*
   important characteristics:
   3.1. RDI agenda
   3.2. RDI collaboration process (university+dual partner)
   3.3. RDI outputs and outcomes

4. **Quality :** *How is quality/quality assessment performed based on the specific characteristics of Dual Study?*
   important characteristics:
   4.1. Quality agenda
   4.2. Quality collaboration process (university+dual partner)
   4.3. Quality outputs and outcomes

The framework is layed out with three variables (heading the columns):

- **Characteristics:** simply the name of the indicator
- **Description:** what is meant by the indicator ?
- **Core Criterion:** the minimum requirement the educational experience must adhere to, so as to be considered Professional Higher Education.

More information about the HAPHE project can be found at http://www.eurashe.eu/projects/haphe/ and the detailed table for the European Dual Study Framework is available here: https://www.eurashe.eu/library/mission-https://www.eurashe.eu/library/2_haphe_eu_seminar_05022014_ppt_framework-anthony-and-raimund-pdf/

General Policy advice is given in the EU CWIHE Handbook, compiled, amongst others, by two of the partners of DIARKAZ (FHJ and DHBW): https://ec.europa.eu/programmes/erasmus-plus/project-result-content/e9b23c89-2db5-4b61-979e-ddfd983137c1/CWIHE%20Policy%20Manual.pdf

3. Dual Higher Education in Germany

The so-called 'Dual Universities' in Germany are mostly public institutions, which provide a system of shared responsibilities between a) the public authorities, providing for academic teaching and learning, and b) private (or public) companies or institutions. The latter take care of the practical aspects of the training and pay a salary to the student, who is considered an employee with special working conditions. Such joint initiatives are not very common across Europe, because they can only exist if a country's prevailing economic conditions allow for a robust base of industries and trade, sustained by a mix of big and small companies. Industries' readiness for cooperation and investment in terms of education or upskilling of staff supports the development of Dual Study concepts.

With respect to the education system, the Federal structure of Germany clearly allows for different shapes and models of Professional Higher Education, following the standards of the European Dual Study Framework. Several education tracks lead to the tertiary level of HE, which are transversally permeable, enabling transition and life long learning.
The Dual Vocational Education System (VET) has a longstanding tradition since centuries, and constitutes the base of ideas for Professional (or 'Dual') Higher Education (PHE). Within VET, students can achieve EQF level 1 to 4, even level 5 if they add a 'vocational' study course. PHE in Germany provides for EQF level 6 and 7. ***

Dual Study programmes contribute to meet the needs of students (e.g. employability), of ecomomy (e.g. qualified staff) and policy makers (e.g. balanced labour market) on the basis of

- close curricular connection between study and work and
- two places of learning (sandwich or consecutive timing, see above).

Three types of programmes can be distinguished, based on a rough differentiation by the proportion of theoretical and practical learning (time and effort) in the academic place and in the work place:

1. **Dual degree Programmes with integrated training** (column 3): lead to both, a first academic degree qualifying for profession (e.g. UAS, DHBW, …)
   plus a degree in a recognised occupation (Chambers of Commerce or Crafts)

2. **Dual degree Programmes with integrated practise** (column 1, 2): students perform placements in a company as part of study and receive a first academic degree

3. **Dual degree Programmes with integrated employment** (column 4, 5, 6): after completion of professional training and/or some years in profession, they lead to a first academic degree, combined with part-time or full-time employment

Type of Cooperative Study Model / Characteristics	1 full time Dual Study Programmes (Universitiy, UAP)	2 full time Dual Bachelor Programmes (University of Cooperative Education DHBW)	3 full time Dual Study Programmes (UAP, University of Cooperative Education DHBW)	4 part time Dual Master Programmes extra-occupational (CAS at University of Cooperative Education DHBW)	5 part time Dual Study Programmes extra-occupational (public or private HE institutions)	6 Advanced Vocational Programme (Trade Schools, Technical Schools, HealthSchools)
Education programme EQF-Level Bachelor / Master	6 (partly incl.4) / 7	6	6 incl. 4	7	6 / 7	6 (or 5)
Type of programme (HVET, PHE, HE)	HE, PHE	HE, PHE	PHE	PHE	HE	HVET (certification by chambers or state authorities)
Average Length of programme Bachelor / Master	3 years / 5 years	3 years	3.5 up to 4 years	2 years or more	3.5 years / 2 years	1-3 years
Proportion of education in institution and in company	different models depending on institution; alternation varying between daily, weekly, monthly or irregular rhythm	alternating 50% in university, 50% work experience (each 4 x 12 weeks per year)	integrated training, mostly alternating in blocks of some months, entirely practical phase in the first year or in the last year	individualised, extraoccupational, allocation of study; time (and places) varies, e.g. evening, weekend, off work time	extraoccupational, allocation of study; time varies, e.g. evening, weekend, off work time	school only, or extraoccupational, allocation of study; time varies, e.g. evening, weekend, off work time
curriculum-integrated, work-related, work-based, work-integrated	curriculum integrated, work integrated	curriculum intergrated, work integrated	partly work based, work integrated, curriculum integrated	curriculum integrated, work integrated	curriculum integrated, work integrated	work integrated, work-related or merely school based
Formal contract	mostly yes (depending on state law and institution)	yes, between company and student	yes, between student and company or health institution	yes, regular work contract between company and student	yes, regular work contract between company and student	yes if work integrated, no, if school based

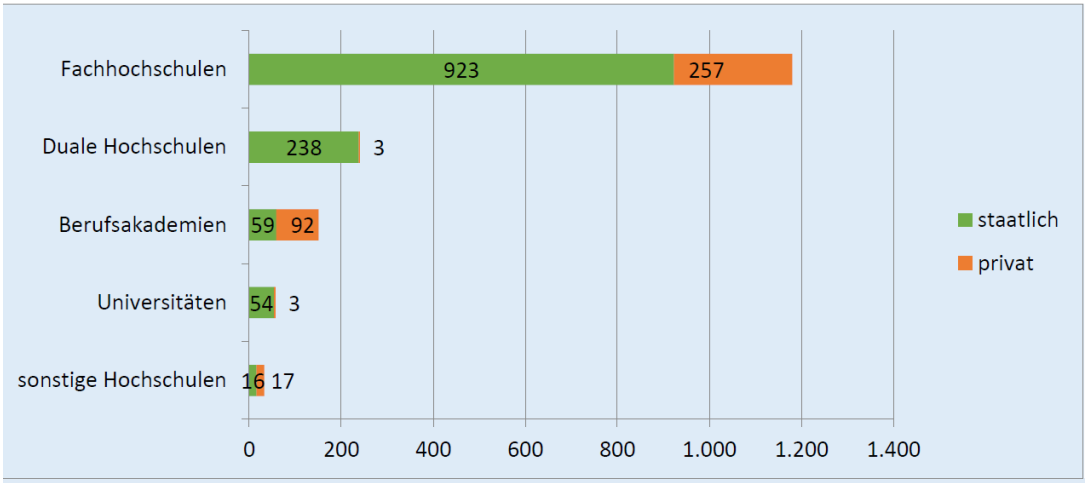
Cooperative Study Programmes in Germany, source: DHBW Heilbronn Ursula C. Göz July 2020

Professional HE in Germany is based on the approved scheme of vocational training and dedicated to fulfill the criteria of the European Framework for Dual Education, developed within HAPHE (https://www.eurashe.eu/library/2_haphe_eu_seminar_05022014_ppt_framework-anthony-and-raimund-pdf/).

Following the tradition of cooperative VET, Dual partner companies or institutions are involved in curriculum development and revision as well as in mentoring of the student during practice periods and partly during the final thesis. HE institutions are responsible for the assessment, however can share this task in some aspects with the Dual partner. Some PHE institutions do have framework agreements with companies or institutions for allocation of study places. In terms of contracts with students, there are different models: a) Dual partner – student contract and b) PHE – student contract.***
The rhythm of academic and workplace phases follows diverse patterns, like e.g.

- a 50:50 scheme of practical and theoretical learning over the whole study course (sandwich pattern),
- a scheme which starts with one year (or more) in the Dual partner institution to be continued by alternating phases of practice and academic learning, or
- vice versa: starting with an academic year, followed by alternating periods of workplace and theoretical learning.

Most of the Dual Study programmes are offered and carried out by Universities of Applied Sciences (UAS), followed by Dual Universities (DHBW) and Professional Academies. Traditional Universities with emphasis on academic education provide merely for a fractional share of PHE, as their profile does not primarily comply with the requirements of the Dual HE approach in Germany.



Quelle: AusbildungPlus-Datenbank (Stand: 2019)

Over the last years, an increasing number of practice integrated Dual Study programmes evolved in the German PHE landscape (column 2, 4 of table). As for 2019, there were **1,662 Dual Study Programmes**, involving 51,060 Dual Partners and 108,202 students all over the country.

The potential for more Dual Study programmes is good as employment rates after graduation are very high and range between 80 and 90%, while drop out rates are between 5% and 15%.

Source: AusbildungsPlus Datenbank BIBB 2020

As **Quality Management** is an important feature of the HAPHE European Dual Study Framework, and **Accreditation** is worthwhile, some **requirements for German Dual PHE programmes** were developed:

1. Applicants have to be generally eligible for HE admission.
2. Involvement of companies in the recruitment process has to be documented and is part of the accreditation.
3. Bachelor programmes last three years and offer 180 ECTS credit points:
   at least 120 ECTS credit points for theory and at least 30 ECTS credit points for practice.

4. There is a clear relation between theory and practice. Academic relevance of practice has to be proved. Practise learning should follow the standards set by AppQ, a joint EU project for ensuring sustainable apprenticeship phases: https://apprenticeshipq.eu/about-the-project/#/

5. The programme includes a final thesis with 6 - 12 ECTS credit points

6. The overall annual working time of students (academic work load for work and study, plus any additional work for the company) has to be "reasonable".
   (No mentioning of any limit, but information from some institutions indicate an average of about 2.000 hrs per year, which is clearly more than the typical full time employment).***

7. Each faculty has to meet criteria for regular Universities of Applied Sciences, e.g. at least 40 % of teaching needs to be provided by employed professors. This is a precondition in order to guarantee institutional research activities and simultaneously creates options for profound and intensive student mentoring.

8. The existence of a Quality Management System for the cooperation of the two different learning environments has to be proved, as well as a thoroughly described mentoring and counseling system (during practise) for students.

9. All programmes should follow the Bologna Process Criteria for HE:
   https://ec.europa.eu/education/policies/higher-education/bologna-process-and-european-higher-education-area_en

Five examples of best practice are described in the Appendix so as to give an impression of how Dual Higher Education works in Germany.

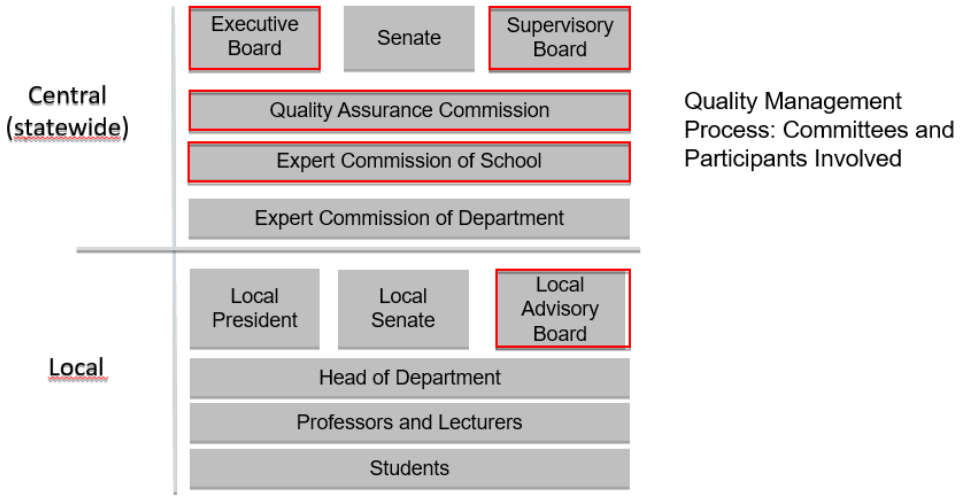
4. DHBW - Best Practise Baden-Württemberg DHBW

The world of work as well as the broad variety of Universities in Baden-Württemberg, a State in the Southwest of Germany, constitute the setting for Professional Higher Education. With a longstanding tradition in automotive production and the highly specified VET system, the 'Dual Study' system benefits form a favourable mix of big companies and SME.
Dual Higher Education is implemented by a state run 'Cooperative University' (Duale Hochschule), since 2009 the successor of the 'Dual Professional Academies '(Berufsakademien). Those Academies worked together in a network, equally covering urban and rural areas form the 1970ies. When the HE status has been granted to the compound of Dual Professional Academies by the Federal State in 2009, the headquarter of the network was set up in Stuttgart, in charge of performing central university functions for nine branches and three campuses.

The '**Baden Wuerttemberg Cooperative University DHBW**' is the largest University of this Federal State, serving about 34.000 students with a broad range of undergraduate study programmes (EQF6) in the fields of business, engineering, and social work. In addition, DHBW offers postgraduate degree programmes with integrated on-the-job training (EQF 7). All degree programmes are both, nationally and internationally accredited (System Accrediation by ZEvA) and are rated as 'intensive study programmes' worth 210 ECTS credit points.

One of the special features of the DHBW is the **fully integrated system**, comprising academia and business as well as the public sector working together to provide study programs. A balanced representation of the main stakeholders is guaranteed by a unique example of legislation: The constitution of DHBW is designed to ensure an equal partnership between the world of work and academia, respecting the governance of an academic institution at the same time. Another important aspect of the DHBW concept is the ability to implement cooperative research projects, thus tightening the bonds with the Dual partner enterprises and institutions eventually bringing academic studies on a more up-to-date level.
In sum, the focus of DHBW is on **working-lifetime employability** through enabling learners to gain holistic job related experiences. Half of the study time is spent with the Dual Cooperation Partner, following a clear curriculum, similar to the university based study period. Students' research projects derive from real issues identified during practical phases. Partner companies or institutions must meet particular requirements in terms of personal and technical equipment, as well as with regard to their commitment being members of the DHBW and, truly important, with respect to the support provided for students. Like professors, Dual Partners can participate directly in the development of the Cooperative University. Equally, students are part of governing committees.

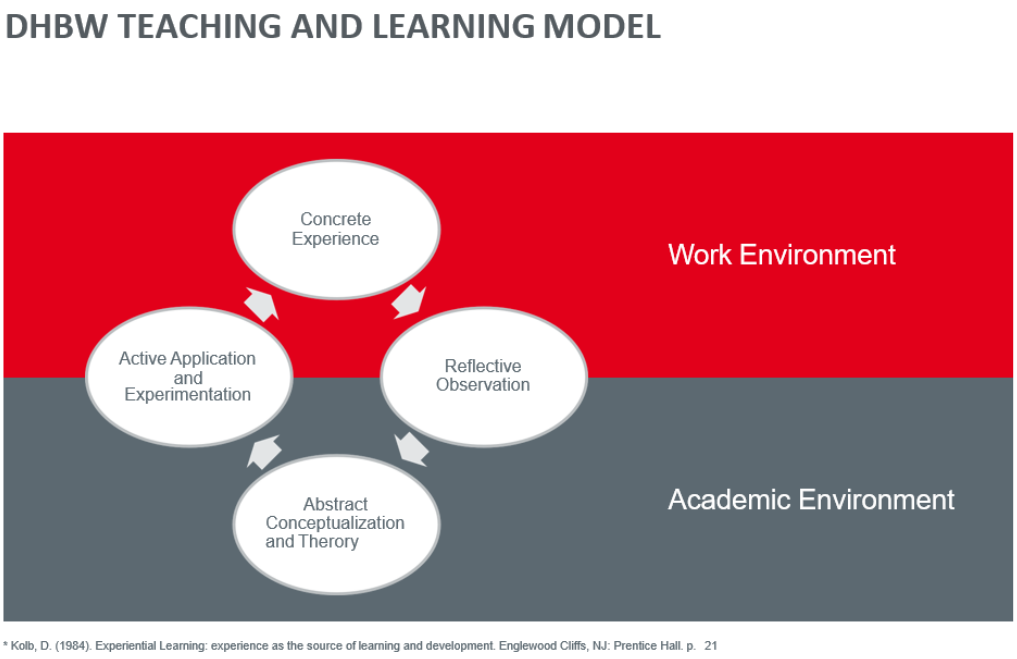
Organizational structure of DHBW as a State-University



(for details please see http://www.dhbw.de/fileadmin/user_upload/Dokumente/DHBW_Grundordnung/Lesefassung_Grundordnung_der_DHBW_einschliesslich_3._AEnderungssatzung.pdf and http://www.dhbw.de/fileadmin/user_upload/Dokumente/Amtliche_Bekanntmachungen/2011/14_2011_Eignungsvoraussetzung_Praxispartner.pdf and the law: http://www.landesrecht-bw.de/jportal/?quelle=jlink&query=HSchulG+BW&psml=bsbawueprod.psml&max=true&aiz=true#jlr-HSchulGBWV19G6b).

4.1. Key Features of Studying at DHBW

Learning at DHBW, no matter on which level of graduation, aims for gaining action competences, personal skills and competences, as well as social competences. Within the given academic programme settings, competence specifications are outlined for every subject. This process is based on the constitutional co-operation of academic staff and partners from the world of work. The periodic change of learning environments, partly in university, partly in one of more than 9000 enterprises and institutions (Dual Partners), confronts students with challenges beyond common academic study experiences. Synergy of theory and practise provides for a holistic experience. In the end, the applicability of learning achievements in real work situations guarantees relevance and quality of learning subjects, which serves the strong focus of the Dual study system on general employability of graduates over work-lifetime.



Cooperative Higher Education: Theory and Practice Integrated

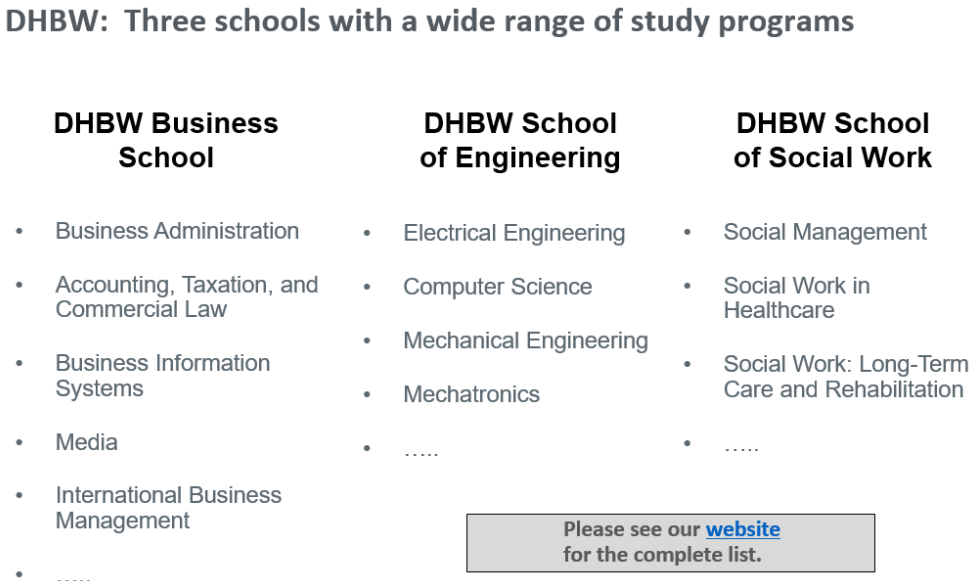
THEORETICAL KNOWLEDGE		PRACTICAL EXPERIENCE
• At DHBW,academic knowledge is conveyed by more than **700 full-time professors** and **9,000 associate lecturers**. • This guarantees that the students are provided **applied** and **up-to-date knowledge** from the chosen professional field.	+	• Work placement at one of over **9,000 partner companies and social institutions** enables the students to reality-test their careers. • As a result, co-op students have a clearer **sense of their career objectives** than the students from academic universities.

The idea of practical usefulness of knowledge, leading to innovation and further development is also essential for the DHBW Master study courses, which represent the consequent progression of the DHBW Bachelor studies.

Several Dual Master study courses were developed in some of the DHBW branches. The merger of them under the umbrella of the Center for Advanced Studies (CAS) in 2014 marked the beginning of a new challenge. According to the needs of further education of employed graduates, the Cooperative Master studies are designed to be pursued in parallel to practising a professional occupation. Different from the Dual Bachelor study concept, students have a regular job and take on additional workload for academic learning in work-free times (evenings, weekends, holidays, '5-day education period'). If the employer is complaisant and supportive, a reduction of weekly working hours or unpaid leave is another option. The synergy of theory and practise is even more obvious in Cooperative Master studies as the available courses are well adapted to the characteristics of contemporary professional profiles. Students are bound to cover distinct core subjects, but get various options to choose supplementing modules according to their own development goals (please see https://www.cas.dhbw.de/startseite/)

4.2. Cooperative Bachelor Studies at DHBW

The first step towards a Dual Bachelor study course is the choice of a study programme of one of the schools (business, engineering, social work), offering a broad variety of 27 Bachelor programmes in over 100 disciplines.

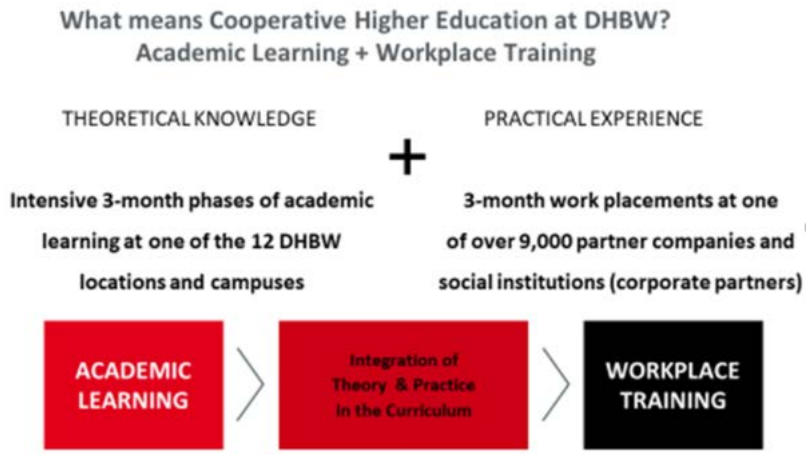


Thereafter, the student gets in touch with a company or institution who offers appropriate Dual study training places. They will assess the eligibility of the applicant. If the outcome is positive, a contract between the student and the Dual partner, providing work-related training, ensures the foundation for the application with DHBW. This contract is usually concluded for a three year period, specifying training conditions, the compensation, social benefits and other work-relevant subjects (https://www.dhbw.de/fileadmin/user_upload/Dokumente/Dokumente_fuer_Duale_Partner/DHBW_Workplace_Training_Contract.pdf and https://www.dhbw.de/fileadmin/user_upload/Dokumente/Dokumente_fuer_Duale_Partner/Explanatory_Notes_DHBW_Workplace_Training_Contract.pdf).

With this contract, the student can submit the application to the DHBW branch, which collaborates with the chosen Dual Partner. After the verification of the study requirements, the DHBW could request further certificates or a test to confirm the student's capability for the particular Dual study course. International students usually have to prove sufficient German language proficiency (level C2), as there are only a few Dual Bachelor programmes or modules offered in English. If the student is admitted to the selected course and discipline, the program will start regularly once a year 1st of October.

Students switch between the university and their workplace training provider every three months, which requires an adequate flexibility and sufficient time management.

Lectures, lab sessions, learning periods, preparation of scientific papers or assessments, work-related projects and presentations have to be managed within the given framework.



During the three years of Bachelor studies, manifold aspects provide for benefits for DHBW students, as there are: small classes, personal care by professors, lecturers and the Dual partner's mentor in charge, as well as contact with experts of these collaborating companies. A further advantage is the financial independence and excellent prospects for future jobs. 85% of the Dual Bachelor students sign in for a regular employment contract even before having finished their degree. Students receive projects and assignments according to their growing abilities, and deepen the combination of academic skills and applied knowledge. Eventually, they graduate with favourable opportunities in any field of industry, business or institution.

Two of the DHBW Dual Study Programmes are characterised in the Appendix (No. 1 and No. 4).

4.3. Cooperative Master Studies at DHBW Center for Advanced Studies

The advanced Dual Study programmes of DHBW Center of Advanced Stuides (CAS) offer academic, research and practical training for graduates who could gain at least one year of relevant work experience in a regular job. One of the crucial requirements is an existing employment contract providing for broadening, expansion and complementing of newly acquired knowledge and skills. The Dual Partner has to make sure that real (research and work) projects as well as personal and professional support of the student is provided for. The other essential requirement is a Bachelor degree in a matching subject area with 210 ECTS credits with a final grading of minimum 2.5 (German level) or at least ECTS classification A or B. It is not relevant which type of HE institution granted the degree, only the credits count. If the obtained Bachelor degree is worth less than 210 ECTS points, certain basic modules have to be completed before embarking on the Cooperative Master study.
Non native speakers benefit from a very good level of German language in order to follow the Dual Master course content and to participate in both, classes and work communications, in a qualified manner. Only some Cooperative Master Modules are implemented in English so far.
The next step is to choose a suitable study programme from the currently 22 Dual Master courses

offered by CAS in three schools (business, engineering, social work/healthcare), which relates to the current occupation. Besides the basic subjects, the Master student then chooses from a large variety of modules, including soft skill units, for configuration of a tailored programme. A compulsory consulting session with an expert from CAS ensures the suitability of choices. Dual Master programmes at DHBW charge tuition fees, depending on the course (in between 3,000 and 9,000 € per year). Students can either start on 1st of April or 1st of October (CAS 2019).

The alignment of a Dual Master course with the needs of the student, is guaranteed by some features differing from Cooperative Bachelor programmes (DHBW 2019):

- continuous real life occupation in the Dual Partner company or institution, interrupted by three-day academic units once a month (<-> three months blocks)
- individual choice of modules in addition to core subjects (<->rigid structure),
- full employee status (<-> trainee status),
- extendable standard period of study, 2 years or more (<-> 3 years fixed),
- lexible groups depending on learning modules (<-> fixed groups),
- study fees for all Master students (<-> study fees for Non-EU citizens only),
- large diversity in pre-Master experiences of students (<-> rather homogenous prerequisites),
- different venues for teaching (<-> in one place).

The benefits for Dual Master students at CAS are obvious from this enumeration. Personal exchange and knowledge sharing in small learning groups (peer to peer learning) build the essence of study times within the career integrated extra-occupational Dual Master studies. Cooperative research provides for skills and knowledge related to complex cause-effect correlations as they occur in work-related issues. However, for (international) Dual Master students, it might be challenging to manage the workload of combined work and study as well as the variety of learning groups in different places (only 50% of courses are at CAS, Bildungscampus Heilbronn). Yet, the diversity within the Dual Master student community coupled with different locations offers excellent learning opportunities.
After having acquired a Cooperative Master degree from CAS, students are able to assume more responsibility and often are designated to take on higher or specialist positions in their respective companies. Some employers account for the study fees, knowing that investment in qualification of employees is a crucial factor to keep them on board. On the long term, this contributes massively to maintain and increase competitiveness.

4.4. Conclusion: Unique Features of the Dual Concept by DHBW

1. The DHBW closely cooperates with more than 9,000 companies and (social) institutions all over Germany – the so-called “Dual partners”.
2. The Dual partners select their students themselves and, as members of the university, company or institutional partners are responsible for the practice-oriented part of the Studies.
3. In the course of their three-year studies, students regularly switch between university and company/institution and receive a regular monthly remuneration.
4. During Dual studies at DHBW, the student drop out rate is less than 5%.
5. The practice-integrated concept ensures that graduates are highly employable. A very large percentage is taken on by the dual partners with a long term work contract.

5. Resources

Chapter ‚Europe'

EU project Apprenticeship Q: https://apprenticeshipq.eu/about-the-project/#/

EU Bologna process: https://ec.europa.eu/education/policies/higher-education/bologna-process-and-european-higher-education-area_en

EU project CIWHE: https://ec.europa.eu/programmes/erasmus-plus/project-result-content/e9b23c89-2db5-4b61-979e-ddfd983137c1/CWIHE%20Policy%20Manual.pdf

EU project HAPHE: http://www.eurashe.eu/projects/haphe/ and https://www.eurashe.eu/library/2_haphe_eu_seminar_05022014_ppt_framework-anthony-and-raimund-pdf/

ETF (European Training Foundation): Work-based learning: A handbook for policy makers and social partners in ETF partner countries, ETF 2014, https://www.etf.europa.eu/en/publications-and-resources/publications/work-based-learning-handbook-policy-makers-and-social

Chapter 'Germany'

Edcuation System:

https://www.hrk.de/activities/higher-education-system/

https://eacea.ec.europa.eu/national-policies/eurydice/content/types-higher-education-institutions-31_en

https://www.kmk.org/fileadmin/Dateien/pdf/Eurydice/Bildungswesen-engl-pdfs/tertiary.pdf

https://www.hrk.de/fileadmin/redaktion/hrk/02-Dokumente/02-06-Hochschulsystem/Statistik/2020-10-07_HRK-Statistikfaltblatt_Hochschulen_in_Zahlen_2020_Englisch.pdf

Professional HE:

Trends and Analyses in PHE (in German):
https://www.bibb.de/dokumente/pdf/06072020_AiZ_dualesStudium-2019.pdf

overview regarding Dual Study courses (in German):
https://www.bibb.de/ausbildungplus/de/dualesstudium.php
https://www.wegweiser-duales-studium.de/studiengaenge/

student information: https://www.hochschulkompass.de/en/degree-programmes/study-in-germany-search/dual-work-study-programmes.html and https://www.wegweiser-duales-studium.de/

PHE Examples from different Federal States:

1. Case Study Volkswagen
   https://www.ubcooperation.eu/pdf/cases/W_Case_Study_Duales_Studium.pdf

2. ‚Hochschule Dual' in Bavaria https://www.hochschule-dual.de/en/
   e.g. THI Technische Hochschule Ingolstadt (UAS) https://www.thi.de/en/studies/degree-programmes/dual-studies/dual-study-models-at-the-thi
   e.g. Hochschule Hof (UAS) https://www.hof-university.com/research-industry/industry/dual-studies/

3. Hochschule Rhein-Waal (UAS) https://www.hochschule-rhein-waal.de/en/academics/prospective-students/our-degree-programmes/dual-study

4. Hamburg School of Business Administration (University organised by Chamber of Commerce) https://www.hsba.de/en/studies/bachelor/overview/ including videos

5. DHBW Cooperative State University Baden-Wuerttemberg https://www.dhbw.de/english/home

Chapter DHBW

Framework:

Law: http://www.landesrecht-bw.de/jportal/?quelle=jlink&query=HSchulG+BW&psml=bsbawueprod.psml&max=true&aiz=true#jlr-HSchulGBWV19G6b

DHBW Constitution:
http://www.dhbw.de/fileadmin/user_upload/Dokumente/DHBW_Grundordnung/Lesefassung_Grundordnung_der_DHBW_einschliesslich_3._AEnderungssatzung.pdf

Dual Partners:
http://www.dhbw.de/fileadmin/user_upload/Dokumente/Amtliche_Bekanntmachungen/2011/14_2011_Eignungsvoraussetzung_Praxispartner.pdf

Bachelor Study:

https://www.dhbw.de/english/studyprogrammes/undergraduate-studies

Master Study:

https://www.dhbw.de/english/studyprogrammes/postgraduate-studies

Appendix:

DHBW: https://www.dhbw.de/english/home and https://www.dhbw.de/english/programmes-listing.html#course-0 and https://www.dhbw-stuttgart.de/themen/studienangebot/gesundheit/angewandte-hebammenwissenschaft-hebammenkunde/profil/

FOM: https://www.fom.de/ and https://www.fom.de/studiengaenge/duales-studium/bachelor-studiengaenge-betriebswirtschaftlich/betriebswirtschaft-und-wirtschaftspsychologie.html

HHN: https://www.hs-heilbronn.de/en and https://www.hs-heilbronn.de/kooperativ

THI: https://www.thi.de/en/ and https://www.hochschule-dual.de and https://www.thi.de/en/electrical-engineering-and-information-technology/degree-programmes/mechatronics-beng and https://www.thi.de/en/studies/degree-programmes/dual-studies/dual-study-models-at-the-thi

6. Appendix

Analysis of five Dual Study Courses in Germany (adapted and supplemented from DualSCI report 'Analyis of Dual Higher Education Study Programmes in Austria, Germany and Spain' 610251-EPP-1-2019-1-RS-EPPKA2-CBHE-SP)

6.1. DHBW Business Administration

NAME OF STUDY PROGRAMME 1:	Business Administration
Website link:	https://www.dhbw.de/english/programmes-listing.html#course-0
Name of implementing university:	Baden Wuerttemberg Cooperative State University Heilbronn (DHBW)
How is DHE defined/understood at this university?	Students study alternately for three months at DHBW and at their Dual Partner (employer) and thus receive integrated theoretical and practical content.
Implementing faculty/department:	Faculty of Business 22 Business Administration study programs in 10 locations in Baden-Wuerttemberg (one of 16 Federal States of Germany)
Joint or double degree? Yes/no – if yes, please indicate.	No
Please indicate the occupation of graduates from this programme (eg IT engineer, physiotherapist etc).	Management positions
Please indicate economic sector where graduates are typically employed (eg banking, insurance, construction, health etc.).	All business sectors: industry, trade, banking, insurance, IT, service companies, consulting, etc.
Degree upon completion:	Bachelor of Arts (B.A.)
Education programme (EQF level):	6
Type of programme (HVET, PHE, HE):	PHE
Obligatory external accreditation of the programme: Yes/no	Yes In 2006, the German Central Agency for Evaluation and Accreditation (ZEvA) accredited all study programmes of the Baden-Wuerttemberg Cooperative State University (DHBW). In July 2008, ZEvA validated the programmes as intensive degree programmes with 210 ECTS points. In 2011, DHBW was the first university in Baden-Wuerttemberg that obtained the system accreditation by the Central Evaluation and Accreditation Agency (ZEvA).
Responsible body for accreditation:	Internal system accreditation by the Central Evaluation and Accreditation Agency (ZEvA)
Length and overall structure of the programme:	Three years The integration model combines training with the dual partner and studies at the DHBW. The curriculum is

	designed in a way that training and studies alternate but also can overlap. After graduation, about 70 percent of the students remain employed by the training company, the Dual Partner.
Entrance exam: yes/no	Depends on school-leaving certificate. If the student has a university entrance diploma, no exam is required.
Fee: yes/no	no
Teaching staff from HEIs in %	About 40
Teaching staff from industry in %	About 60
Specific requirements for teaching staff (e.g. practical experiences/managerial position in industry etc.).	Practical experience (min 3 years in industry)
Balance between education in institution & company (in % and number of days/months) e.g. 6 months in company or 1 day at institution and 4 days a week in company etc.).	1. - 6. Semester: Interlinking training / theoretical phase and practical phase – each semester 12 weeks theory at the university and 12 weeks practical training at the dual partner company.
Dual approach: **Curriculum-integrated, work-related, work-based, work-integrated.** Please select appropriate answer.	Curriculum-integrated; work-integrated
Formal contracts with company (yes/no). If yes – please indicate type of contract	Yes – Training / study contract between the company and the student. The company has a contract with the university, which grants the right to fill a certain number of places with dual students. The company advertises those dual study positions on job portals and selects the students. The university accepts the students that the company selected. So, it is in fact the company (and not the university) that does the selection for admission.
Payment of students by industry partners (yes/no, partly..)	Yes
Support provided by the programme (i.e. service matching and career guidance)	Not relevant
Please indicate how/at what stages industry partners are involved in curriculum design and review (e.g. definition of functions, competences, LOs and syllabi).	Close cooperation with dual partner in the preparation and review of the curriculum.
Assessment: **Student assessment by HEIs (in %)**	Exams at HEI 100%

Student assessment by industry partners (in %)	
Modalities of assessment during apprenticeship periods:	Theoretical and oral exams.
Final thesis: ratio of mentors from HEIs and industry	One mentor on each side, but evaluation is exclusively on the HEI side
Drop-out rates in the last 5 years (if applicable):	5 to 10 percent over the study period of 3 years
Upon completion, is there a right to continue education at universities (yes/no, MA/PhD level)?	Yes, by completing the study program 210 ECTS points are awarded. These can be recognised when applying for an MA/PhD level.
Are data available regarding the employment rates of graduates? If so, please indicate.	Depening on study program and yeargroup 80 to 90 percent
Key resource documents:	
Additional comments/observations:	

6.2. FOM Management & Business Psychology

NAME OF STUDY PROGRAMME 2:	**Management & Business Psychology (Betriebswirtschaft & Wirtschaftspsychologie)**
Website link:	https://www.fom.de/ https://www.fom.de/studiengaenge/duales-studium/bachelor-studiengaenge-betriebswirtschaftlich/betriebswirtschaft-und-wirtschaftspsychologie.html
Name of implementing university:	FOM Hochschule für Oekonomie & Management
How is DHE defined/understood at this university?	FOM Hochschule für Oekonomie & Management GmbH, Essen, Germany describe themselves as "the university for professionals", meaning that students are in regular employment whilst studying in the evenings, on week-ends, and off-work times. Some students get partially refund of the university fees from their employer, some don't. Employers may grant their studying employees additional time for their studies, several do so. FOM is the biggest private university in Germany with 55,000 students at 32 study centres in Germany and one in Austria.
Implementing faculty/department:	-/-
Joint or double degree? Yes/no – if yes, please indicate.	No (single degree)
Please indicate the occupation of graduates from this programme (eg IT engineer, physiotherapist etc).	Management positions, expert positions in customers management, human resources, market research, product design, organisation, change management, etc.
Please indicate economic sector where graduates are typically employed (eg banking, insurance, construction, health etc.).	All economic sectors
Degree upon completion:	Bachelor of Science (B. Sc.)
Education programme (EQF level):	6
Type of programme (HVET, PHE, HE):	HE
Obligatory external accreditation of the programme: Yes/no	Yes, system accreditation (valid until 2027) plus accreditation by the Wissenschaftsrat (Council of Science and Humanities, official advisory body of the Federal and Laender governments of Germany) approved by the Land of Nordrhein-Westfalen (North Rhine-Westphalia) since 1993.
Responsible body for accreditation:	FIBAA
Length and overall structure of the programme:	7 semesters, 180 ECTS credits
Entrance exam: yes/no	No

Fee: yes/no	Yes (currently 12,690 EUR in total., monthly or quarterly rates)
Teaching staff from HEIs in %	No information available. (minimum number of HEI staff following § 72 (2) no. 7 of NRW universities law: ½ ("überwiegend"= mainly)
Teaching staff from industry in %	No information available. (but only half of teaching is provided by own Professors, the other half by external teachers from industry, freelancers, and some staff from other universities).
Specific requirements for teaching staff (e.g. practical experiences/managerial position in industry etc.).	For Professors: the usual requirements by law For external teachers: academic degree
Balance between education in institution & company (in % and number of days/months) e.g. 6 months in company or 1 day at institution and 4 days a week in company etc.).	University offers three different time models: ***1)*** *"evenings + Saturdays":* a) 2 or 3 evenings per week (Mo till Fr) 18:00 – 21:15 and 2 or 3 Saturdays/Month 08:30 – 15:45 b) every Friday 18:00 – 21:15 and Saturday 08:30 – 15:45 ***2)*** *"evening model":* 3 evenings per week (Mo till Fr) 18:00 – 21:15 ***3)*** *"day studies":* a) 2 days per week (Mo through Fr) normally 08:30 – 15:45 or b) 1 day per week plus Saturdays 08:30 – 15:45 There are no requirements for the practical training, most students work in a normal job (full-time or part-time).
Dual approach: **Curriculum-integrated, work-related, work-based, work-integrated.** Please select appropriate answer.	Work-based
Formal contracts with company (yes/no). If yes – please indicate type of contract	No
Payment of students by industry partners (yes/no, partly..)	Yes (they are normal employees)
Support provided by the programme (i.e service matching and career guidance)	Mentoring programme offered by alumni some years ago, no information about ongoing programmes.
Please indicate how/at what stages industry partners are involved in curriculum design and review (e.g. definition of functions, competences, LOs and syllabi).	No involvement, but on the level of the funding body of the university.
Assessment: **Student assessment by HEIs (in %)** **Student assessment by industry partners (in %)**	HEI 100 %
Modalities of assessment during apprenticeship periods:	None

Final thesis: ratio of mentors from HEIs and industry	100 % HEI
Drop-out rates in the last 5 years (if applicable):	about 20 % (as compared to 50 % in other business and economy study programmes, as FOM claims), including students who only change the city.
Upon completion, is there a right to continue education at universities (yes/no, MA/PhD level)?	Yes
Are data available regarding the employment rates of graduates? If so, please indicate.	55 % of FOM graduates after c. 1.5 years receive an income of at least 4,000 EUR/month (as compared to 1/3 of graduates of other universities). C. 29 % of Bachelors and 36 % of Masters report they have budget and turnover responsibility. Nearly ¼ of graduates say they had staff reporting to them 1.5 years after finishing their studies (Masters': 31 %). Most have an employer before they start to study, so employment rates are high.
Key resource documents:	
Additional comments/observations:	This model is called "dual" but the same model is offered also without the adjective "dual". A dual partner company is not really required. Positions are offered as "vocational training", "practice-integrated" or "internship" and "traineeship". It seems to be possible to be employed anywhere in any job.

6.3. HNN Engineering co-operative

NAME OF STUDY PROGRAMME 3:	Cooperative Study_Model – Degree Programm (Kooperatives Studienmodell – Bachelorprogramm) - Different combinations available
Website link:	https://www.hs-heilbronn.de/kooperativ
Name of implementing university:	**Heilbronn University of Applied Sciences** (Hochschule Heilbronn HHN)
How is DHE defined/understood at this university?	Different Models of scheduling practical and academic learning phases: **a)** cooperative study course (incl. VET) **b)** practise integrated study course
Implementing faculty/department:	Faculties: Faculty Mechanics and Electronics (T1) Faculty Economics and Engineering (TW)
Joint or double degree? Yes/no – if yes, please indicate.	Yes – within 4 years 10 months, graduates of the cooperative study program acquire two degrees, the Vocational Training Qualification EQF 4 and the Bachelor of Science (or Engineering) EQF 6 .
Please indicate the occupation of graduates from this programme (eg IT engineer, physiotherapist etc).	Engineer in different branches or departments (Research& Development, IT, Manufacturing, Logistics, Purchasing…).
Please indicate economic sector where graduates are typically employed (eg banking, insurance, construction, health etc.).	Industry (Manufacturing Companies, Logistics Companies)
Degree upon completion:	Bachelor of Science (Bachelor of Engineering)
Education programme (EQF level):	6 (and possibly 4)
Type of programme (HVET, PHE, HE):	PHE
Obligatory external accreditation of the programme: Yes/no	Yes
Responsible body for accreditation:	ACQUIN
Length and overall structure of the programme:	**a)** 5.5 years, **cooperative study course:** after 1.5 years in VET with dual partner, start of academic learning for two years (VET exam after 1st semester), 5th semester completely at workplace, followed by one year at university, 8th semester Bachelor thesis with Dual Partner; every period without lectures is for workplace learning! **b)** 4 years, **practise integrated study course:** after 8 - 12 weeks of internship, full time study for two years, 5th semester in company, followed by one year full time study, 8th semester Bachelor thesis with Dual Partner; every period without lectures is for workplace learning!

Entrance exam: yes/no	Depends on school-leaving certificate. If the student has a university entrance certificate, no exam is required.
Fee: yes/no	No
Teaching staff from HEIs in %	80%
Teaching staff from industry in %	20%
Specific requirements for teaching staff (e.g. practical experiences/managerial position in industry etc.).	Practical Experience
Balance between education in institution & company (in % and number of days/months) e.g. 6 months in company or 1 day at institution and 4 days a week in company etc.).	1,5 years vocational training: 70% Company, 30% professional school) 1– 4 Semester: 60% at University, 40 % at Company 5 Semester Company 6 – 7 Semester (50% at University, 50% in Company (or more, depends on Bachelor Thesis)
Dual approach: Curriculum-integrated, work-related, work-based, work-integrated. Please select appropriate answer.	Curriculum-integrated; work-integrated
Formal contracts with company (yes/no). If yes – please indicate type of contract	Yes – training contract
Payment of students by industry partners (yes/no, partly..)	Yes, for the whole length of study course
Support provided by the programme (i.e service matching and career guidance)	Not relevant
Please indicate how/at what stages industry partners are involved in curriculum design and review (e.g. definition of functions, competences, LOs and syllabi).	Close cooperation with the dual partners by developing the program (Fachbeirat and University Council).
Assessment: **Student assessment by HEIs (in %)** **Student assessment by industry partners (in %)**	Exams at HEI about 75% Exams at Professional School about 25%
Modalities of assessment during apprenticeship periods:	Theoretical, oral and practical exams. Graduation with the Chamber of Commerce and Industry (IHK).
Final thesis: ratio of mentors from HEIs and industry	One mentor on each side.
Drop-out rates in the last 5 years (if applicable):	Not documented, empirical value, less than 2%.
Upon completion, is there a right to continue education at universities (yes/no, MA/PhD level)?	Yes, by completing the study program 210 ECTS points are awarded. These can be recognised when applying for an MA/PhD level.

Are data available regarding the employment rates of graduates? If so, please indicate.	Not documented on website, due to the fact, that the company is investing time and money for the education of the students: every graduate gets a job offer.
Key resource documents:	
Additional comments/observations:	

HNN Model **a)** cooperative study course

HNN Model **b)** practise integrated study course

6.4. DHBW Advanced Midwifery Science

NAME OF STUDY PROGRAMME 4:	Advanced Midwifery Science (Angewandte Hebammenwissenschaft – Hebammenkunde)
Website link:	https://www.dhbw-stuttgart.de/themen/studienangebot/gesundheit/angewandte-hebammenwissenschaft-hebammenkunde/profil/
Name of implementing university:	Baden Wuerttemberg Cooperative State University Stuttgart (DHBW)
How is DHE defined/understood at this university?	Students alternate for three months at the DHBW and at their Dual partner (employer) and thus receive integrated theoretical and practical content.
Implementing faculty/department:	Faculty of Health
Joint or double degree? Yes/no – if yes, please indicate.	Yes - Within four years, graduates of the integrated training programme acquire two degrees: the examination as midwife (State VET exam) and a Bachelor of Science.
Please indicate the occupation of graduates from this programme (eg IT engineer, physiotherapist etc).	Midwife
Please indicate economic sector where graduates are typically employed (eg banking, insurance, construction, health etc.).	Health - Direct care of women and families in clinical and non-clinical settings, implementation of scientific projects.
Degree upon completion:	Bachelor of Science
Education programme (EQF level):	6 and 4
Type of programme (HVET, PHE, HE):	PHE
Obligatory external	Yes

accreditation of the programme: Yes/no	
Responsible body for accreditation:	Internal
Length and overall structure of the programme:	Three years of study - within the framework of a four-year training to become a midwife with State Examination. The integration model combines training with the dual partner with studies at the DHBW Stuttgart. The curriculum is designed in a way that training and studies can overlap. Training and studies are conducted within four years, whereby the studies only begin after the first year of training. In accordance with the standard period of study, the course of study lasts three years. In the third year of study, i.e. after the training, the students remain employed by the training company, the Dual Partner.
Entrance exam: yes/no	Depends on school-leaving certificate. If the student has a university entrance diploma, no exam is required.
Fee: yes/no	No
Teaching staff from HEIs in %	About 40
Teaching staff from industry in %	About 60
Specific requirements for teaching staff (e.g. practical experiences/managerial position in industry etc.).	Practical experience (minium 3 years in the respective profession)
Balance between education in institution & company (in % and number of days/months) e.g. 6 months in company or 1 day at institution and 4 days a week in company etc.).	1st, 2nd , 3rd Semester: interlinking training / theoretical phase and practical phase - 12 weeks; 4th Semester: Interlinking training / theoretical phase and practical phase – 20 weeks.; 5th Semester theory and practical phase– 12 weeks each; 6th Semester theory and small practical phase 9 weeks. please see https://www.dhbw-stuttgart.de/fileadmin/dateien/Angewandte_Hebammenwissenschaft/Studienverlaufsplan_Hebammenkunde.pdf and https://www.dhbw-stuttgart.de/fileadmin/dateien/Angewandte_Hebammenwissenschaft/Rahmenstudienplan_Hebammenkunde.pdf.
Dual approach: Curriculum-integrated, work-related, work-based, work-	Curriculum-integrated; work-integrated

integrated. Please select appropriate answer.	
Formal contracts with company (yes/no). If yes – please indicate type of contract	Yes - Training contract
Payment of students by industry partners (yes/no, partly..)	Yes
Support provided by the programme (i.e. service matching and career guidance)	Not relevant
Please indicate how/at what stages industry partners are involved in curriculum design and review (e.g. definition of functions, competences, LOs and syllabi).	Close cooperation with the midwifery school/dual partner in the preparation of the curriculum. Joint modules together with the midwifery school.
Assessment: Student assessment by HEIs (in %) Student assessment by industry partners (in %)	Exams at HEI about 70% Exams at midwifery school about 30%
Modalities of assessment during apprenticeship periods:	Theoretical, oral and practical exams. Graduation with the state examination
Final thesis: ratio of mentors from HEIs and industry	One mentor on each side, but evaluation is exclusively on the HEI side

Drop-out rates in the last 5 years (if applicable):	The study programme has been implemented in 2018, therefore no data is available yet.
Upon completion, is there a right to continue education at universities (yes/no, MA/PhD level)?	Yes, by completing the study program 210 ECTS points are awarded. These can be recognised when applying for an MA/PhD level.
Are data available regarding the employment rates of graduates? If so, please indicate.	Due to the glaring lack of midwives in Germany, a high takeover rate is expected.
Key resource documents:	
Additional comments/observations:	

6.5. THI Mechatronics

NAME OF STUDY PROGRAMME 5:	Mechatronics (as an example)
Website link:	https://www.thi.de/en/electrical-engineering-and-information-technology/degree-programmes/mechatronics-beng
Name of implementing university:	Technische Hochschule Ingolstadt THI, Ingolstadt, Germany
How is DHE defined/understood at your university?	In Bavaria public Universities of applied sciences (UAS) combine their study programmes with formal vocational education. There is a land-wide network called "Hochschule Dual Bayern e. V." (https://www.hochschule-dual.de) with 20 member universities. As an example of many different programmes, a 'compound' study course of the Technical University of Ingolstadt (THI) has been chosen.
Implementing faculty/department:	Electrical Engineering and Information Technology
Joint or double degree? Yes/no – if yes, please indicate.	Yes Bachelor (B. Sc.) combined with Chamber Certificate in state-recognised occupation (VET certificate)
Please indicate the occupation of graduates from this programme (eg IT engineer, physiotherapist etc).	Engineer in mechatronics in development or high-tech production, e. g. in automotive industry.
Please indicate economic sector where graduates are typically employed (eg banking, insurance, construction, health etc.).	Industry, engineering.
Degree upon completion:	Bachelor of Science (B. Sc.) and "journeyman's certificate for the electrical trade" by the Chamber of Craft Trade (Gesellenbrief der Handwerkskammer für München und Oberbayern)
Education programme (EQF level):	6 including 4
Type of programme (HVET, PHE, HE):	HE combined with vocational training (similar to HNN, a practical enhanced integrated programme is offered)
Obligatory external accreditation of the programme: Yes/no	Yes
Responsible body for accreditation:	ASIIN e. V. (Accreditation Agency for Study Programmes in Engineering, Information Science, Sciences and Mathematics, a body founded by universities and professional associations)
Length and overall structure of the programme:	7 semesters
Entrance exam: yes/no	No, but "numerus clauses" (a certain mark required) and a six weeks pre-study internship.
Fee: yes/no	No (state university)
Teaching staff from HEIs in %	n/a
Teaching staff from industry in %	n/a (industry is responsible for practical training)

Specific requirements for teaching staff (e.g. practical experiences/managerial position in industry etc.).	n/a
Balance between education in institution & company (in % and number of days/months) e.g. 6 months in company or 1 day at institution and 4 days a week in company etc.).	The integrated cooperative Study course, starts with a 12 months phase in the industry at the beginning (VET). This ends with the mid-time exam of the Chamber of Craft Trade. Then the time at workplace is limited to 1 month after every semester of 4.5 months duration, except for the 5th semester, which, like in most UAS study programmes, takes place in industry only. After the 5th semester, the exam of the Chamber of Craft Trade takes place (VET exam).The Bachelor thesis is due in the 7th semester. please see https://www.thi.de/en/studies/degree-programmes/dual-studies/dual-study-models-at-the-thi
Dual approach: Curriculum-integrated, work-related, work-based, work-integrated. Please select appropriate answer.	Work-based
Formal contracts with company (yes/no). If yes – please indicate type of contract	Yes
Payment of students by industry partners (yes/no, partly..)	Yes
Support provided by the programme (i.e service matching and career guidance)	Service matching and career service "Hochschule Dual" offers a Bavaria-wide matching service.
Please indicate how/at what stages industry partners are involved in curriculum design and review (e.g. definition of functions, competences, LOs and syllabi).	No information available, probably only on informal level regarding university programmes.
Assessment: **Student assessment by HEIs (in %)** **Student assessment by industry partners (in %)**	HEI 100 % of academic assessment for B. Sc. Industry: no assessment
Modalities of assessment during apprenticeship periods:	Chamber of Craft Trade: mid-time and final exam Industry: practitioners serve as examiners on behalf of the Chamber
Final thesis: ratio of mentors from HEIs and industry	1:1 (recommended)
Drop-out rates in the last 5 years (if applicable):	n/a
Upon completion, is there a right to continue education at	Yes, M. Sc.

universities (yes/no, MA/PhD level)?	
Are data available regarding the employment rates of graduates? If so, please indicate.	No
Key resource documents:	
Additional comments/observations:	

‘compound ‘ Dual Study programme of THI