Result 3.1
Solution concepts for the integration of vocational training and further vocational training

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1. Project Summary and Introduction

The word region is defined as “an area, especially part of a country or the world having definable characteristics but not always fixed boundaries”[1]. The Baltic Sea region (BSR) is particularly unique. While the Baltic Sea is the pivotal point defining much of the region’s characteristics and challenges, the countries are also extremely different. Geographically, they are divided between Northern, Western and Central/Eastern Europe, historically, they have been shaped by the East-West divide after the second world war. Nevertheless, given their proximity to the Baltic Sea, they have much in common.

The EU has acknowledged this by issuing the very first macro-regional strategy, the EU Baltic Sea Region Strategy in 2009. As most countries boarding the Baltic Sea were by then EU member states, it can well be considered the EU’s inland sea. The challenges, such as saving the sea, i.e. ensuring clear water, rich and healthy wildlife as well as clean and safe shipping, and the opportunities for a prosperous region through cooperation measures to increase innovation, deepen the single market by improving transportation systems, connecting energy markets and fighting trans-border crime together, make the region very distinct from other parts of the world. Therefore, “BSR integration is best understood as the way that European integration has been translated into this region, further deepening and leveraging access to the rest of Europe and the markets that the EU provides”[2]

Over the past 25 years, this region has become a densely integrated, e.g. in the areas of trade, investment, labor mobility, transport and energy infrastructure as well as research collaboration. Furthermore, it demonstrates a broad landscape of robust cross-border organizations and collaborative efforts. Nevertheless, “companies do not look at the Baltic Sea Region as one integrated market in terms of their strategies. For most of them, the region remains a group of individually small markets within the EU, each with its different dynamics, rivals, and often even regulatory rules’”[3].

Keeping this in mind, the lack of comprehensive regional data collection is surprising. Therefore, as part of the Erasmus+ funded project “Promoting permeability through dual bachelor's programs with integrated initial and further vocational training” (BA&VET), an analysis of the region’s demography, economy, and labour as well as education market has been conducted. The majority of the data is taken from the Eurostat database of the European Union. When needed additional sources, such as the OECD database have been consulted as well.

[1] Oxford Dictionary
[2] Skilling, David (2018). *The Baltic Sea Economies: Progress and Priorities*. Copenhagen: Baltic Development Forum, p.10.
[3] Ibid., p.11

1.1 Project summary

Objectives: What do you want to achieve by implementing the project?

- Increasing permeability between vocational and higher education
- Recruiting universities for tasks of further education in climate and environ-mental protection
- Providing excellently qualified entrepreneurs, managers and skilled workers and reducing the shortage of skilled workers to meet the challenges in climate and environmental protection
- Strengthening the productivity of SMEs through innovation support and R&D projects
- Promoting cooperation between SMEs and colleges/universities

Implementation: What activities are you going to implement?

- Analyses economy, education and labour markets and qualification needs
- Creation of solution models for 4 project countries
- Development and implementation of Train the Trainer program
- Development and implementation of 2 dual three-stage Bachelor's degree programs and 2 further trainings in climate and environmental protection
- Implementation of R&D projects in SMEs
- Quality assurance for training measures and project implementation
- Dissemination, transfer of results and implementation consultation

Results: What project results and other outcomes do you expect your project to have?

- Result report of the analyses of the economy, education and labour markets and qualification needs
- Solution models for four project countries
- Complete train-the-trainer program
- Module manuals with all documentation for two dual three-stage Bachelor's programs in climate and environmental protection
- Two further education programs in climate and environmental protection
- R&D projects implemented in SMEs
- Quality manual and results reports
- Manual, result videos and broad regional transfer of results

1.2 Objectives, results and target groups

The main objectives of the project are as follows:

a) Increasing the permeability between vocational education and training and higher education and thus promoting the attractiveness of vocational education and training

b) Strengthening the recruitment of colleges/universities for the important tasks of continuing education in climate and environmental protection

c) Providing highly qualified entrepreneurs, managers and skilled workers who, in addition to good theoretical knowledge, also have practical competences, skills and professional experience in climate and environmental protection and reducing the shortage of skilled workers to cope with the very large tasks in the energy, climate and environmental sector.

d) Attracting entrepreneurs and executives who have all the skills to successfully run a company and perform high-quality tasks in climate and environmental protection

e) Strengthening the productivity and competitiveness of enterprises through knowledge and technology transfer, promotion of innovation and implementation of manageable R&D projects

f) promoting cooperation between SMEs and colleges/universities, strengthening colleges/universities to implement dual courses of study on climate and environmental protection, and promoting entrepreneurship in higher education.

In pursuit of these objectives, the following results will be achieved:

1. Analysis results on the economy, demography, education and labour markets as well as qualification needs in climate and environmental protection

2. Curriculum, Teaching materials, implementation report and evaluation concept and report for teacher training

3. Module handbooks with integrated continuing education, teaching materials, examination regulations, implementation reports as well as evaluation concept and reports for a three-stage dual Bachelor's degree program

- "Business Administration & Sustainable Management of SMEs"
- "Management of renewable building energy technology"

4. Concept for promoting innovation by SMEs and evaluation concept and report

5. Concept for innovation promotion of SMEs and R&D projects carried out for SMEs

6. Concepts and report for the evaluation and quality assurance of qualifications and R&D subsidies as well as project implementation, transfer of results, implementations and implementation consultations

The primary target groups of the project are:

a) school leavers who wish to combine vocational education and training with a bachelor's degree and thus receive excellent employment and professional career opportunities.

b) students who are qualified in higher education and university and at the same time in a company and who are highly welcome in SMEs as managers and professionals or as independent entrepreneurs.

c) owners, managers and specialists of SMEs who are qualified in continuing vocational training, acquire tailor-made competences and skills for high-quality activities in climate and environmental protection and achieve a recognized continuing vocational qualification.

d) SMEs that attract suitably qualified young entrepreneurs, managers and specialists, receive innovation funding and carry out R&D projects together with colleges/universities.

The project addresses the following secondary target groups (beneficiaries):

a) colleges and universities which, in order to expand their educational opportunities in climate and environmental protection, receive all the documents and materials for two new dual bachelor's degree programs in order to meet the labour market needs and the conditions of SMEs in particular.

b) chambers and other vocational training institutions which attract strong young people to vocational training, receive curricula for continuing vocational training modules for the qualification of SMEs and their staff, and cooperate intensively with col-leges/universities in teaching and innovation promotion.

c) teachers, advisers and lecturers from chambers, other VET providers and colleges/universities who are qualified in Train the Trainer programs to provide high-quality further training, to carry out dual study courses in cooperation with companies as well as innovation promotion and R&D projects for SMEs at a high-quality level.

1.3 Development Concepts and models

For the implementation of this project work, concepts, models and module handbooks for Bachelor's degree programs with integrated vocational training and continuing vocational training were developed, discussed and agreed upon:
a) “Business Administration & Sustainable Management of SMEs” degree course with integrated recognized continuing education in “Sustainable Management”.
b) “Engineering in Management of Renewable Energy Technology in Buildings” degree course with integrated recognized continuing education “Energy Service Manager/energy Consultant”.
Both courses combine practice and theory as well as the integration of vocational training, further education and higher education. In the partner countries of the project, however, the legal regulations on the implementation of dual study courses and the integration of vocational training into study courses vary greatly. Alternative solution models were therefore developed with a view to future implementations for

- the realization of vocational education and training and
- the implementation of Bachelor's degree courses with integrated vocational education and training.

The alternative models and possible solutions developed are listed below as Result 3.1 Solution concepts for the integration of vocational training or in combination with dual study courses.

2. Current situation related to permeability of vocational and academic training[4]

Whereas in the earlier years and decades a relatively clear distinction was identifiable in the profile of vocational and academic educational and qualification pathways[5], especially in Austria and Germany as well as other European countries the contours have blurred nowadays.

With increase of the number of bachelor courses since the beginning of Bologna reforms in 1999 and their professional differentiation and specialization today many courses have acquired strong professionally utilizable components with a view to the requirements of the economy.[6] On the other hand in the field of vocational further training the requirements to the participants , for example, vocational further training courses become stricter on the basis of permanent consideration of current technologies and techniques or they stay consistently strict. These overlaps with other training and qualification systems respectively result in the fact that professional requirements which have to be fulfilled in the professional sphere in some places are more and more difficult to distinguish from the requirements of bachelor courses.

In many cases within rather technically oriented qualification pathways (vocational and academic) it is required to perform a comprehensive and profound analysis of a problem or issue from practical experience having recourse to valid obtained measurement results using approved tools, methods and methodologies, and subsequently to develop reflected suggestions concerning the form and the solution of the problem and to document them in a legal manner.

Therefore, it comes as a little surprise that the question of equivalence of vocational and academic training and qualification pathways and degrees is being increasingly

[4] Compiled by Berufsakademie Hamburg~~, 2020~~

[5] professional training and further training = orientation at operating requirements of economy; academic training = orientation at scientific and research-oriented requirements of society

[6] Thanks to the Bologna process especially further development of national higher education systems in Europe, the qualification of specialists for the labour market as well as of the junior scientific staff were taken into consideration. In this regard the increase of the so-called employability plays a special role. It means that university graduates can take up qualified employment on the basis of scientific education (professional and interdisciplinary competences as well as qualifications related to the specific profession). (Source: https://www.bmbf.de/files/Bericht_der_Bundesregierung_zur_Umsetzung des_Bologna-Prozesses_2012-2015.pdf, p. 5)
In actual fact the higher education system thereby becomes closer exactly to the (at least) German vocational training system, because in § 1 paragraph 3 of the Vocational Training Act (BBiG) it is defined for the training that vocational training (…) has to convey required professional skills, knowledge and capabilities (occupational competence) within the framework of well-regulated courses in order to perform qualified professional activity in the changing working environment. Also within the framework of further training in the field of skilled crafts the orientation of the examination in crafts which are subject to authorization according to the criteria of employability and thereby the participation at the market or competition belongs to the cornerstones of the vocational training system. In § 45 paragraph 2 of the Trade and Crafts Code it is determined that “thanks to the master examination it has to be determined if the examinee is qualified to exercise a craft which is subject to authorization and to perform independently as well as properly train the apprentices.

discussed in the European countries which have both: a differentiated academic and at the same time professional training and qualification system (e.g. Germany, Austria, Switzerland). Thereby an important milestone is the creation of the instrument of the national qualification network using which it can be specified on which levels vocational and academic training and qualification can be acknowledged as equivalent. In the German Qualifications Network (DQR) after intensive verification and application of DQR criteria further vocational qualifications was classified on Level 5 and the vocational qualification “Meister (Master craftsman)” was classified as equivalent (not: similar) to the academically established Bachelor’s degree.

However due to diverse national provisions in the laws related to higher and vocational education this basic representation of equivalence in everyday life does not lead to any particular consequences for the holders of corresponding vocational or academic degrees. A master craftsman may not refer to himself only on the basis of obtained master craftsman degree either as “Bachelor” or this fundamental equivalence of degrees in the DQR does not enable him to have simplified access possibility to master craftsman courses.

On the other hand, graduates with a bachelor’s degree also may not refer to themselves as master craftsmen even if they should have acquired their academic bachelor’s degree in a similar professional field.

It is very unlikely that the fundamental legal barriers will be removed in the foreseeable future and a genuine applicability of equivalence will be available in the everyday practice through full recognition of performance in the corresponding other system.

Due to not complete legal separation of different vocational and academic educational and qualification pathways there are however fundamental possibilities of application of performance results in one system into the other system.

Therefore, for example, there is a fundamental possibility to achieve (at least) partial applicability of performance during one training according to the requirements of the vocational training system in order to have passed both training and qualification pathways in the end according to a very costly procedure which can only be schedulable conditionally as well as be able to use corresponding qualification designations without legal restrictionsc.

On the other hand, there is also a fundamental possibility to credit vocational qualifications of training and further training in one course of studies at least partially in order also to subsequently obtain a degree according to the model which will be kind of streamlined concerning time, basing on vocational degrees.

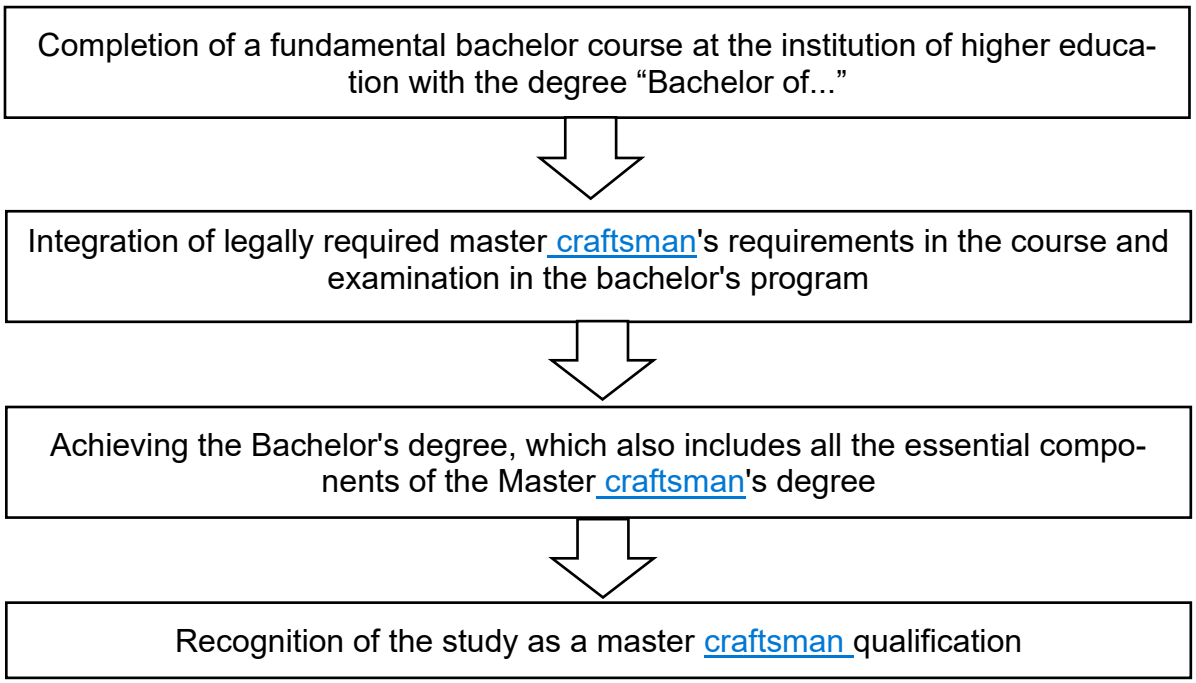
Both possibilities will be presented and critically examined below.

3. Possibilities of application of performance results which have been already obtained in one educational system7

3.1 Recognition of academic achievements in the parts of further vocational examination

If an academic training is completed successfully the graduate in Germany can be exempt from separate of the four parts of the master craftsman's examination in a craft subject to authorization according to relevant provisions in the Crafts Code if during these examinations at least similar requirements are set as during the master craftsman's examination (cf. § 46 paragraph 2).

Overview 1: On the basis of training to become also a master craftsman



3.1.1 Peculiarities and problems:

The determination of meeting the requirements is up to the examination board of the vocational training organization (as a rule Chamber of Crafts). Thereby the determination of requirements takes place only afterwards, i.e. after the completion of the studies. Thus, there is absolutely no planning certainty, predictability or even "guarantee" for the determination of meeting the requirements of the studies for the master craftsman's examination. Besides in can be almost impossible that the bachelor course which is designed solely for the purpose of achievement of an academic degree reproduces all the parts of the master craftsman's examination completely and extensively.

[7] Compiled by Berufsakademie Hamburg, 2020. The possibilities are presented using the example of further vocational training to become a master craftsman.

Therefore, in practice it is about determining the similar requirement for separate parts of the master craftsman's examination but never about complete recognition of the course for all the parts of the master craftsman's examination. Therefore, the still absent parts of the master craftsman's examination must still be completed additionally by the graduates of a course subsequently with the corresponding amount of effort.

3.1.2 Conclusion:

In conclusion it can be determined for this procedure that there are significant risks in respect of the scope of actual acknowledgement of course contents. Furthermore, as a rule separate parts of the master craftsman's examination are not covered by the course anyway so that even after the partial acknowledgment persons interested in the master craftsman's degree face not only additional loads related to time but also organizational and as a rule financial load.

In the end this is not an attractive educational and qualification pathway which meshes vocational and academic qualification together in a reasonable manner. Despite basic available transparency related to the represented possibility of acknowledgement of studies for the master craftsman's examination this procedure is not the expression or even a good example for the creation of extensive equivalence of vocational and academic pathways and degrees.

Theoretically it would be possible to extend the above-mentioned procedure for the real equivalence only so that all the requirements of the master craftsman's examination which are relevant for this examination had to be integrated in the existing structures and legal provisions of the (already available) course. With the acquisition of the regular bachelor's degree, it could be proven that all the requirements of the master craftsman's examination are met. These evidence could be in turn completely acknowledged by the responsible master craftsman's examination board to be able to award also the title of a master craftsman correspondingly.

However, it must be critically noted that such integration of master craftsman's examination requirements in existing structures of a course which are secured by the higher education laws hardly has any realistic chances for success. Subsequent change of courses can therefore be regarded as generally pointless and hardly realizable.

Another possibility to at least partially credit vocational qualifications of training and further training in the course for the purpose of creating more equivalence is presented below.

3.2 Acknowledgement of further vocational qualification for the parts of the training

This option is based on the crediting of knowledge and skills which have been acquired by persons with vocational qualification interested in the course outside of higher education. Institutions of higher education[8] have various possibilities to credit knowledge and skills which have been acquired within the framework of vocational training and further training, e.g. master craftsman's examination or within the framework of professional practice. The duration of studies should be reduced through crediting the performance results of persons with vocational qualification interested in the course and thereby one of the biggest inhibitions for the taking of a course of the target group of persons with vocational qualifications should be lowered.

This acknowledgement of educational background including not formal and informal learning required by the European education ministers within the framework of the Bologna process was obligatorily implemented, for example, in Germany for the institutions of higher education already through decisions of the Conference of Ministers of Education and Cultural Affairs[9]. According to the results of the Conference of Ministers of Education and Cultural Affairs the crediting of performance results can be performed through:

3.2.1 Individual examination on a case-by-case basis

Thereby on the basis of documents provided by the vocationally qualified applicant it is examined if and to what extent his qualifications acquired outside of the sphere of higher education are equivalent to the parts of the course concerning the content and the level. If equivalence is determined within the framework of the examination on a case-by-case basis these proven qualifications can substitute the equivalent results of performance during studies and examinations.

3.2.2 General crediting

Thereby certain vocational qualifications which have been as a rule determined by the institution of higher education in advance as equivalent concerning content and level are acknowledged for a homogenous group of applicants (like e.g. graduates of a master craftsman's examination) without further verification of the individual case.

[8] Also further in the text the term "Institution of higher education" is used as a generic term for institutions of the tertiary education sphere, including universities, universities of applied sciences, technical colleges etc.

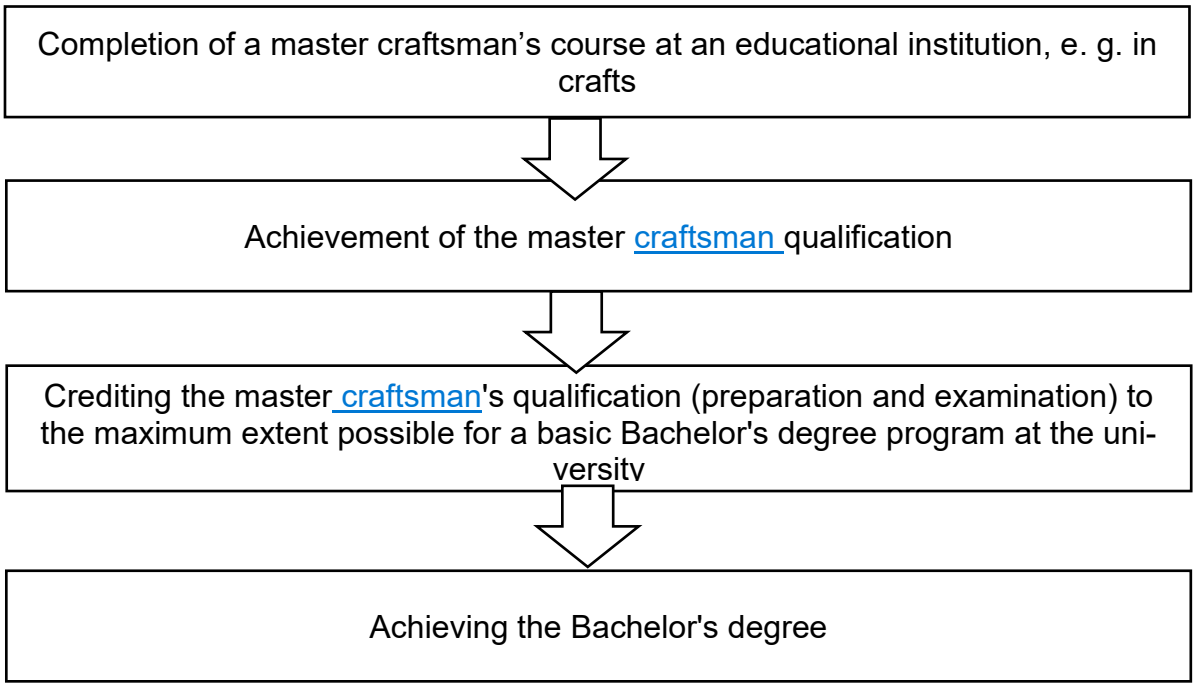
[9] Cf. decisions of the Conference of Ministers of Education and Cultural Affairs concerning the crediting of knowledge and skills acquired outside of the sphere of higher education in the higher education I (dated 28.06.2002) and II (dated 18.09.2008)

3.2.3 Placement examination

Thereby individual knowledge and skills of the vocationally qualified applicant are verified in a formal examination procedure for the purpose of his placement to a higher study semester.

The Conference of Ministers of Education and Cultural Affairs in Germany has limited the amount of credit possibilities to 50% of the volume of higher education studies.

Overview 2: On the basis of master craftsman's qualification also become a bachelor



3.2.4 Peculiarities / problems:

The regulation related to the crediting of knowledge and skills of persons with vocational qualifications as performance results of studies and examinations is basically reasonable and on the basis of theoretically possible share of credit of 50% can contribute to the reduction of the period of studies and therefore to the politically desired facilitation of transfer of persons with vocational qualification in the sphere of higher education.

In the crediting practice of institutions of higher education, the situation however shows that crediting volume which leads to the significant reduction of studies and thereby creates an incentive for taking a course is achieved relatively seldom. The decision of the Conference of Ministers of Education and Cultural Affairs from the year 2008 has basically determined that the institution of higher education shall decide under own responsibility if and to what extent the crediting of those knowledge and skills can be performed which have been acquired outside of the sphere of higher education.

Thereby it is explicitly pointed out that such a decision of the institution of higher education [can] not be replaced "On the basis of diverse possibilities of content-related design of courses, [...], on the one hand, and the variety of possibilities for professional training and further training, on the other hand […]".[10]

Especially due to the reason of diversity of vocational and academic qualification substantial problems arise during the verification of proven vocational qualifications in respect of equivalence concerning contents and level. The equivalence of vocational qualifications is therefore often not determined only because the quantity of hours of courses attended within the framework of formal vocational qualification measure is as a rule lower than the workload[11] of courses evaluated within the framework of the ECTS. Thereby however knowledge and skills which are acquired in this field in the professional environment in the informal manner are not taken into consideration completely. Moreover, in the curricula of vocational qualification measures as a rule only the number of classroom-based events (class hours) is declared and not the time for "self-study phases" which are however entered as "self-study" in the estimation of academic courses workload.

Further difficulties can arise during the verification of equivalence with regard to levels. Due to diversity of goals of vocational qualifications and academic courses the comparison is also difficult in this case. While vocational qualification measures are first of all aimed at the transmission of professional competences in case of academic courses also science-oriented goals are paramount. In the form of the German Qualifications Network (DQR) an aid is available for the determination of equivalence which can help at least by formal recognized vocational qualifications. So, for example, the master craftsman's qualification is assigned to the same level as the bachelor degree. However vocationally qualified applicants cannot derive a right for the crediting of their qualifications. During the verification institutions of higher education can independently of the grading in the DQR come to the result that qualifications are not equivalent. Therefore, the DQR does not have a direct influence on the crediting practice of institutions of higher education.

Apart from these problems during the verification of equivalence due to structural diversity substantive reservations are observed by several university representatives in respect of acknowledgement of equivalence which can lead to an especially strong application of formal verification criteria with regard to content, time scope and levels in the verification practice.

[10] Cf. decision of the Conference of Ministers of Education and Cultural Affairs concerning the crediting of knowledge and skills acquired outside of the sphere of higher education in the higher education II (dated 18.09.2008), p. 3

[11] Workload = amount of work for studies in a classroom and self-study

3.3 Generalized crediting through cooperation with vocational education and further education institutions

The decisions of the Conference of Ministers of Education and Cultural Affairs in Germany already cited above obligate the institutions of higher education "… to make use of existing possibilities of crediting and to develop procedures and criteria for the crediting of knowledge and skills acquired outside of the sphere of higher education in the corresponding examination regulations".[12] The Conference of Ministers of Education and Cultural Affairs recommends the institutions of higher education to use cooperation with appropriate training and further training institutions in order to reduce effort related to examinations on a case-by-case basis and to enable generalized crediting for homogenous applicant groups.

An example of such cooperation is the collaboration of a university of applied sciences for SMEs (FHM) with the Cologne Chamber of Crafts. Collectively the course "B. Sc. Industrial Engineer" was developed which is based on the complete crediting of master craftsman training conducted by the Chamber of Crafts. The course was "… conceived so that competences transferred during the master craftsman training correspond to the competences provided for the bachelor course of FHM and due to equivalence can be completely credited during studies".[13] Thereby the allowed volume of acknowledgement of 50% was exploited completely and thus the reduction of the regular study time from 18 terms to 9 terms was achieved.[14]

It is undisputed by university representatives if vocational qualification measures in respect of conveyance of science-based fundamentals are sufficient.[15]
Both specified fundamental possibilities of crediting of acquired performance results of a training and qualification system in the corresponding other system and the outline of problems which are related thereto and which are partly substantial during the achievement of real equivalence of vocational and academic degrees and authorizations lead to the consideration that it is more expedient in total to conceive a bachelor course from scratch so that both the required science-oriented fundamentals and competences necessary for the achievement of a master craftsman's qualification are conveyed integrally. This possibility is presented in the following option.

[12] Cf. decision of the Conference of Ministers of Education and Cultural Affairs concerning the crediting of knowledge and skills acquired outside of the sphere of higher education in the higher education II (dated 18.09.2008), p. 3
[13] Expert report related to the decision of the FIBAA accreditation board for programs concerning the accreditation of the course Industrial Engineer (B. Sc.) dated 27./28.9.2012, p. 13
[14] Cf. Homepage of FHM, http://www.fh-mittelstand.de/wirtschaftsingenieur/
[15] So, in the expert report related to the initial accreditation of the course "B. Sc. Industrial Engineer" of FHM it is criticized: "Especially concerning the part of the course related to engineering sciences experts missed various basic subjects. So, experts missed, for example, the following technical subjects: Fundamentals of Mechanics, Fluid Mechanics, Thermodynamics and Chemistry on the level of engineering sciences. The fundamentals resulting from the master craftsman training are oriented at crafts. The module provided in the FHM "Natural and engineering fundamentals I and II" is not sufficient in the opinion of experts for the conveyance of required fundamental knowledge of an engineer. (Expert report related to the decision of the FIBAA accreditation board for programs concerning the accreditation of the course Industrial Engineer (B. Sc.) dated 27./28.9.2012, p. 28

4. Integral conveyance of further vocational training and bachelor within the framework of studies[16]

On the basis of presented procedure related to the creation of equivalence as well as demonstrated problems, difficulties and challenges the third way for the design of vocational master and bachelor's degrees is presented below.
The fundamental objective of the project idea outlined here is to create an educational and qualification system where the master craftsman's qualification and the bachelor course are integral parts of a common system. Thereby all the required legal provisions and framework conditions for obtaining corresponding degrees have to be identified at first and they have to be considered during the design of a common educational and qualification pathway.

The design of such third way of a bachelor course with integral vocational master qualification in addition to legal provisions includes also a variety of institutional, organizational, curricular, personal and if necessary other design parameters which are clarified exemplarily in the overview below.

Overview 3: design parameters for an integral vocational and academic educational and qualification system

Fundamental design parameters of the system	**Verification of necessity and suitability of...**
Institutional and spatial equipment for courses and examinations	Seminar rooms, laboratories, technical rooms, libraries, examination rooms...
Sufficiency of personnel incl. lecturers and examiners	Qualifications, experiences, ideas about equipment and staffing incl. full-time and part-time lecturers and examiners
Sufficiency of personnel incl. employees for organisation, management and administration	Qualifications and experiences
Curricular and contentual requirements	(Framework) course concepts, module handbooks, minimum number of hours for modules, courses and examinations, examination requirements and tasks (written, oral, practical...)
Institutional and legal requirements	Implementing course and examination organizations, e. g. chambers, universities, educational institutions… Legal provisions for vocational and academic education pathways, e. g. admission regulations, course and examination regulations...
Practical requirements	Cooperation and practice partners, e. g. enterprises for the acquisition of practical experiences...
Other requirements	...

[16] Compiled by Berufsakademie Hamburg, 2020. The possibilities are presented using the example of further vocational training to become a master craftsman.

If you follow this third way, there are three central areas of responsibility in particular which emerge for the creation of such an integral system and which are briefly described below.

4.1 Area of responsibility A

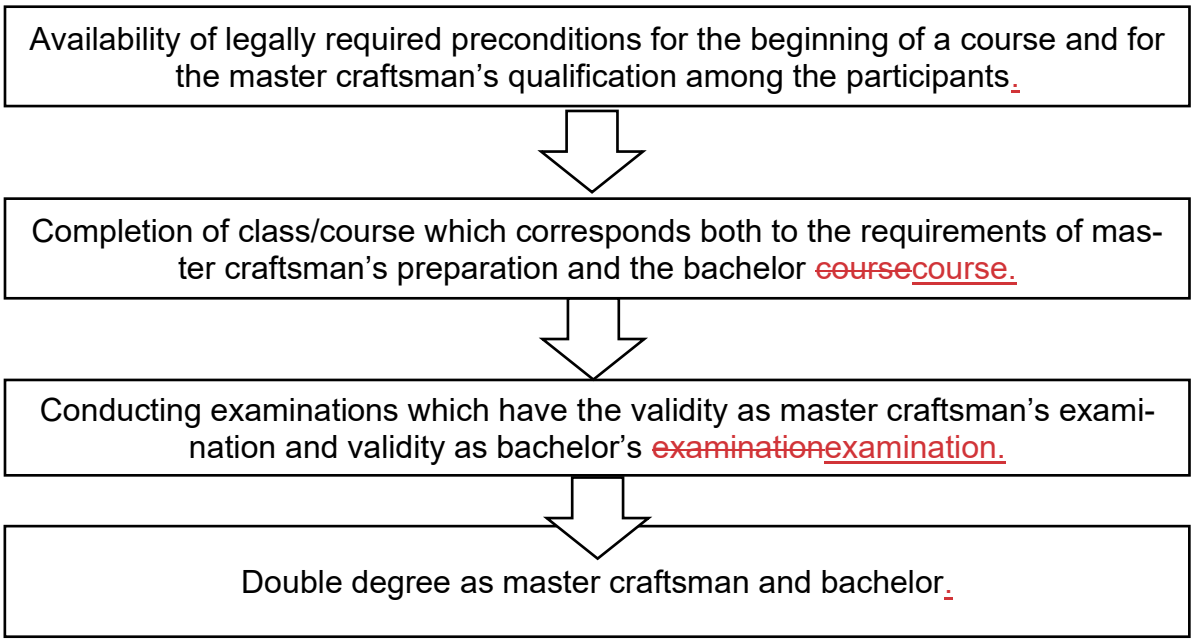
First all existing and available legal and curricular framework conditions (as a rule laws and regulations) for the identification of (minimum) requirements of the vocational master craftsman examination and subject-specific comparable bachelor course should be surveyed and analyzed.
The main focus of the analysis should be especially the corresponding admission provisions, scope and duration of the course and studies (minimum workload), main topics, types and scope of examinations, requirements and scope of final examinations as well as further specific requirements if any which have to be taken into account for the creation of an integral system.

4.2 Area of responsibility B

In connection with the survey and analysis a synopsis (comparison) should be prepared for the relevant legal provisions and regulations as well as curricular benchmark figures in respect of their differences and similarities and “open points”. Thereby the matching and especially not matching of the relevant legal and curricular framework conditions can be shown and the scope of substantial organizational areas can be determined.

4.3 Area of responsibility C

In this area of responsibility C on a specific example the development of a kind of “blueprint” for the organization of a bachelor course with integrated master craftsman’s qualification on the basis of legal and curricular required framework conditions and organizational areas can be conceived.
Overview 4: Integral attainment of a bachelor and master craftsman degree



The above model is realised in the present project with a complete integration of vocational master craftsman training in a dual bachelor's degree programme.
In addition, however, initial vocational training is integrated within the framework of the four-year dual study programme, so that the participants acquire three recognised educational qualifications:

- ✓ Journeyman or skilled worker
- ✓ Vocaational Master in the learned occupation
- ✓ Bachelor in the chosen field of study

In the event that initial vocational training is not to be integrated, alternative models for acquiring vocational training are described in the following chapter.

5. Alternative options for achieving vocational training and activities

Many dual Bachelor's degree programmes integrate initial vocational training. Furthermore, since recognised continuing vocational education and training degrees usually require completed vocational training, the question arises as to how initial vocational training can be realised in bachelor's degree programmes with integrated continuing vocational education and training.

5.1 Vocational Training

To begin with, it is plausible to develop a training program that integrates initial vocational training, further vocational training and a bachelor's study course with respective three recognised educational qualifications/diplomas/degrees. In Germany, occasionally such pathway is chosen as a so-called "three-way study pathway". In fact, this is not an integrated training program, but rather single parts of the training are completed one after the other. Integration of all three training courses under dual bachelor's programs is an excessive demand for the participants.
If all three training courses were integrated in a dual bachelor's study program, with a study term of about four years, participants would have to complete:

a) dual vocational training, in a company and in a vocational school, usually lasting 3 to 3,5 years, including the option of reduction by about one to one and a halfyear, if the participant has a high school degree and can evidence particularly excellent educational achievements,
b) a further vocational training, lasting in a full-time mode some, but for many professions one year,
c) a complete bachelor's degree program, usually lasting at least three years,
d) training and professional activities in a company, comprising at least 50% of the total training time for dual study programs, during the entire four-year qualification period.

If all three parts (a) - c)) nare not to be integrated into one training programme, there are four alternative ways to complete vocational training.

5.1.1 Several years of professional activity or study

With any vocational training at all, conditions for admission to the further vocational examination are absolutely equally fulfilled:

a) in case of evidenced professional activity of at least five years in the relevant or in a related profession, or
b) upon completion of a bachelor's study in a subject relevant to the respective profession of further vocational training.

The dual bachelor's degree program fulfils these admission requirements.

5.1.2 Completion of vocational training prior to commencing a study

Prior to commencing a study, participants complete a dual vocational training course, which upon presentation of a middle school leaving certificate, high school diploma and good grades during vocational training, usually lasts two years. This path is especially recommended.
Successful completion of the journeyman or skilled worker exam, plus several years of professional experience also entitle candidates with no university qualification to admission to a subject-related study at a technical college (German *Fachhochschule*).

5.1.3 External journeyman or skilled worker examination

Participants without any formal vocational training can apply during their study as extraordinary applicants for admission to a journeyman or skilled worker examination[17].
The decision on admission is with the competent examining board or competent chamber.
If the required knowledge and skills were not part of the dual study course at the university or in the partnering company, they shall be acquired in self-study.
This approach involves some legal uncertainty for candidates, making it impossible to know in advance, whether they will get admission to a journeyman or skilled worker examination, and whether their knowledge and skills acquired are sufficient to pass the exam.

5.1.4 Admission to the further vocational training examination without any prior vocational training

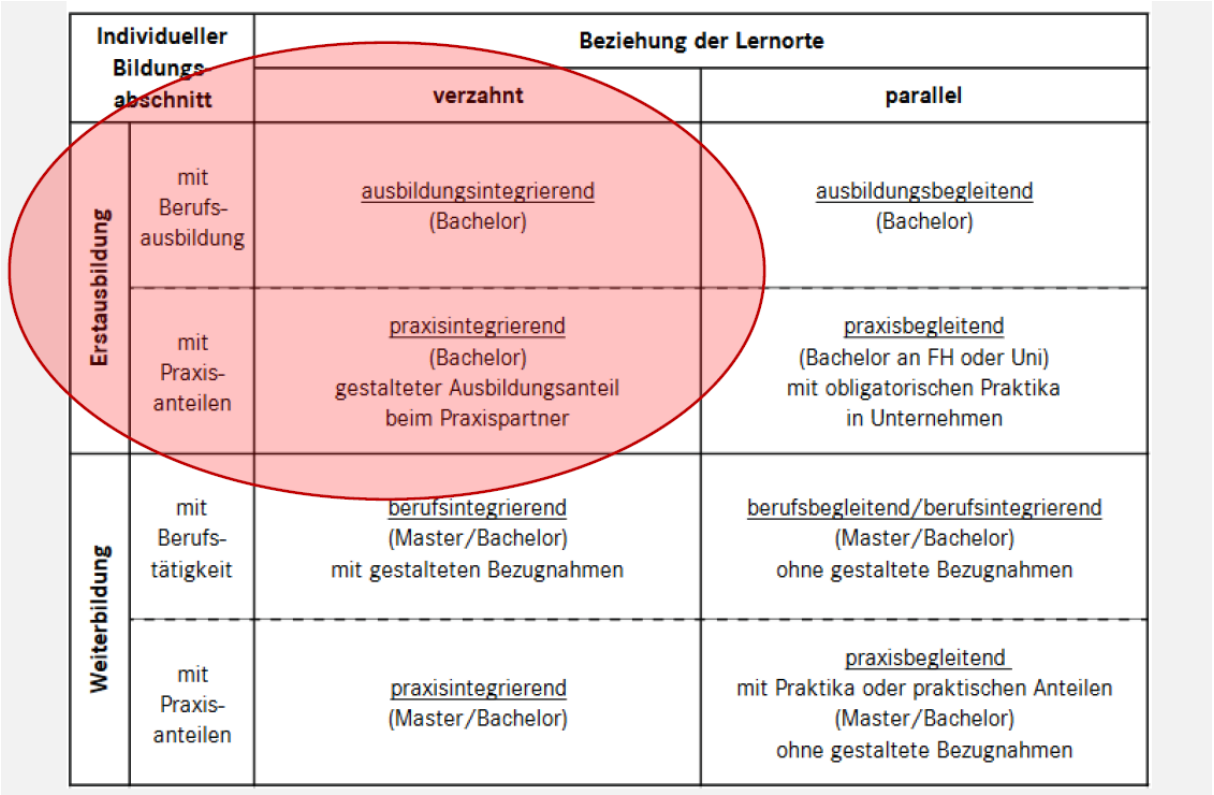
One final option is the possibility of admission to the further vocational examination without any prior professional training. Decision regarding such exceptions is with the competent examination board.
However, this pathway involves the legal uncertainty that it is not certain in advance, whether admission to the further vocational examination will be granted. For dual study programs, chances for admission to the further vocational examination without prior vocational training are high due to the occupational activity and training in the partnering company during the study period.

It is optimal if the vocational training is integrated into a dual Bachelor's degree programme. If this is not possible or desired, the first alternative appears to be suitable for dual Bachelor's degree programmes. However, given the significance of vocational training and experience with regard to further vocational training and subsequent employment in small and medium-sized enterprises, participants should also be recommended the second option, with prior vocational training. By contrast, option three and four should remain exceptions. However, the final decision is with participants, they shall decide for themselves. But in neither case, successful completion of vocational

training shall constitute a condition for admission to a dual bachelor's degree program with integrated further vocational education.

5.2 Concept of study-integrating vocational education and training

The following overview provides a summary of the different formats for dual study programmes.



Individueller Bildungsabschnitt		Beziehung der Lernorte: verzahnt	Beziehung der Lernorte: parallel
Erstausbildung	mit Berufsausbildung	ausbildungsintegrierend (Bachelor)	ausbildungsbegleitend (Bachelor)
Erstausbildung	mit Praxisanteilen	praxisintegrierend (Bachelor) gestalteter Ausbildungsanteil beim Praxispartner	praxisbegleitend (Bachelor an FH oder Uni) mit obligatorischen Praktika in Unternehmen
Weiterbildung	mit Berufstätigkeit	berufsintegrierend (Master/Bachelor) mit gestalteten Bezugnahmen	berufsbegleitend/berufsintegrierend (Master/Bachelor) ohne gestaltete Bezugnahmen
Weiterbildung	mit Praxisanteilen	praxisintegrierend (Master/Bachelor)	praxisbegleitend mit Praktika oder praktischen Anteilen (Master/Bachelor) ohne gestaltete Bezugnahmen

Wissenschaftsrat (2013): Empfehlungen zur Entwicklung des dualen Studiums -Positionspapier.
https://www.wissenschaftsrat.de/download/archiv/3479-13.pdf?__blob=publicationFile&v=4

For the integration of vocational training in Bachelor's degree programmes, a distinction must be made between
a) training-integrated format, which provides for an interlocking of vocational training and Bachelor's study.
b) training-integrated format, which conducts vocational training and Bachelor's studies in parallel.
In the present project, initial vocational training, further vocational training and a bachelor's degree course are to be developed and realised in one training course. Both concepts are suitable for this demanding project, especially the training-integrating model.

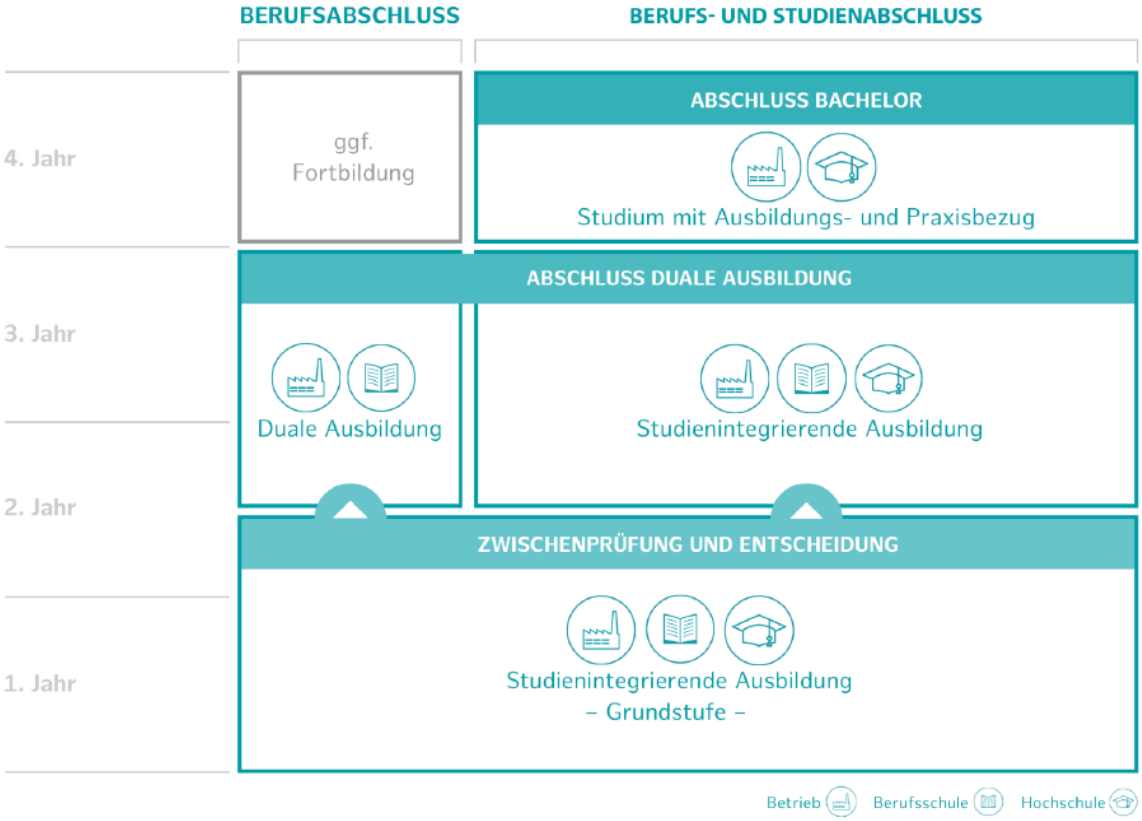
The concept of study-integrating training comprises the following key points:

- The starting point for the considerations is dual training, study content is linked to the acquisition of competences in dual training
- Equal learning venues: company, vocational school, university

- Recognition of achievements at non-university places of learning
- Interlinking of curricula in terms of content and personnel
- Orientation of the annual workload to a 40-hour week to ensure studyability
- Experience-based decision on continuation of studies after 1.5 years with coaching support

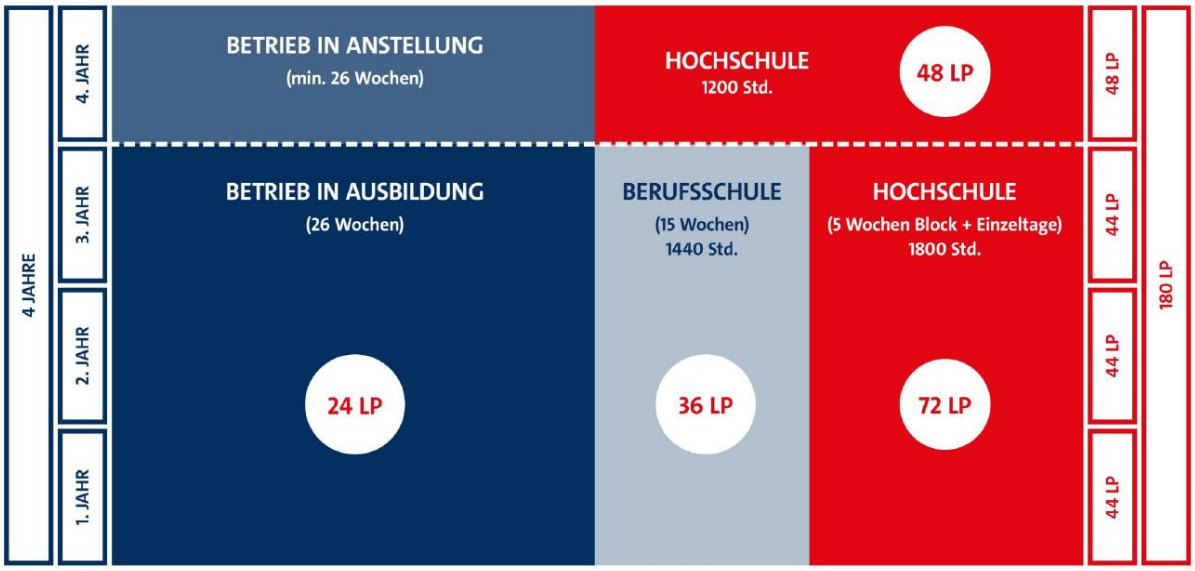
The diagrams below provide an overview of the structure and model of the integrated degree programme.[18]

Structure of the study-integrated training



Training and study model

[18] Prof. Dr. Joachim von Kiedrowski, Berufliche Hochschule Hamburg, 2022



In the present project initial vocational training is integrated within the framework of the four-year dual study programme, so that the participants acquire three recognised educational qualifications:

- ✓ Journeyman or skilled worker
- ✓ Recognised vocational further education qualification
- ✓ Bachelor in the chosen field of study

6. Vocational training, further vocational training and fields of studies

The following must be selected for the implementation of this project:
a) fields of studies with a focus for the bachelor's degree
b) occupations for initial vocational training
c) further vocational training with a recognised qualification, the content of which can be combined with a Bachelor's degree programme (see a)).

These decisions must be made against the background of tomorrow's world of work and according to the conditions and needs of the younger generation and companies. These aspects are summarized in the following excursus.

6.1 Excursus: Tomorrow's world of work

6.1.1 Division of labour

In order to be able to cope with the high and rising costs of increasing prosperity and social security, it was necessary to rationalize to a large extent, to condense work and to make it more and more joyless. The result is an economy in which work is increasingly seen as a necessary evil of earning a living, and this evil should be kept to a minimum:
Achieving continuous productivity progress is the basis of the economy and has so far enabled steady growth. Increasing productivity is achieved through division of labor and specialization. At the same time, division and specialization must be driven forward in accordance with the system in order to enable productivity growth until the individual person only performs the smallest excerpts, can no longer establish the overall context for himself and loses a strong degree of wholeness. For the narrow specialist, it is then hardly possible to find meaning in working life. At the same time, the tactility is lost: the individual can recognize the effects of his actions less and less.
Far-reaching division of labour leads to a loss of quality; the sum of the individual parts does not result in a living whole.
Progressive division of labour leaves behind uncoordinated states that require control. Inevitably, this is associated with more and more unproductive action in the intrinsic sense; the effort for coordination and control is increasing rapidly. Coordination and control take place once with the help of power apparatuses of the different hierarchical levels. A constantly increasing external determination is the inevitable consequence.
Even more effectively, however, the control is carried out by self-manipulation of the individual. Idealistic values such as wholeness, self-determination, influence, co-creation, finding meaning, etc. are suppressed and material values come to the fore one-sidedly. Work is then perceived as a necessary evil in order to achieve growing material prosperity. The decade-long suppression of essential values leads to long-term consequences that we are experiencing today: alcohol and drug abuse, ideals of fascism and accumulation of mental illness.

6.1.2 Cooperation

The negative consequences of the division of labour, such as loss of meaning or increase in social costs, are overcome through comprehensive cooperations that enable further productivity progress at a high level of quality.

Cooperation requires outstanding and new qualifications; personal-social skills are gaining a significant increase in importance. Internal, inter-company and international cooperations are based on the principle of combining individual or operational strengths: Everyone does what they do best and is an integrated member of a team of holistic work. Through these paths of "cooperative specialization", higher qualities, lower costs and great productivity advances are achieved.

Cooperation requires the highest degree of decentralised availability and intensive exchange of information. Information technologies are ideal problem solvers for this. They make information available decentrally and in the future the living room will also become the workplace. Information advances are becoming smaller, which is accompanied by a gradual disempowerment of the headquarters.

Cooperative forms of work must be created within the company. Employees are no longer reduced to their employment contract and the "sale" of their labour. As part of their remuneration, they will receive co-ownership rights and participate financially in the company's success by contributing their manpower and personality. Material and intangible employee participation are experiencing a rapid increase in importance. The boundaries between specialists and managers and also between employees and entrepreneurs are blurred. Everyone becomes a co-entrepreneur.

The highest levels of innovation and creativity are required. Every head is needed and must be involved in independent thinking and acting responsibly. Changed value weightings have an effective effect with an increase in the importance of previously suppressed values, such as self-determination, influence, co-creation, holisticness, manageability, etc. Independenceis becoming an important determining factor.

Internal and inter-company as well as international cooperation requires the highest degree of trust. This is an economically indispensable principle. The only cultural feature for securing the prosperity and competitiveness of a company and also of a society is trust. Responsible action is required in all areas.

Holisticness, cooperation and personal responsibility on the basis of trust create an almost inexhaustible free energy in all areas of work and life. Trust motivates people to the highest degree and is at the same time the most important organizational principle and control instrument, especially in cooperation.

6.1.3 Decentralization

Changes in the framework conditions favour decentralisation and the development of smaller units. New and additional jobs will be created almost exclusively in smaller companies. The economics of scale are declining.

6.1.4 Control and guidance

In the working world of tomorrow, the self-coordination of the individual as well as overvisible groups will gain in importance and increasingly be controlled by lived value cultures. The individual companies must become one with their moral substance. They will form a kind of "faith community" in which the employees are intensively involved and find what they really need in terms of material and idealistic values.
The previous economy has primarily demanded functioning technocrats and washed them to the top of the companies. In the future, corporate management will again need much more personalities who have mastered the art of leadership – people of the type of artist or visionary as well as the original German master craftsman.
While the employees develop into co-entrepreneurs, the employers become the meaning of the work. This frees up free social energy in companies, the enormous potential of which has so far remained largely untapped in most companies. The reserves in this regard are so considerable and the economic effects so far-reaching that the associated economic gains are greater than the international differences in the level of labour costs.
Work undergoes a decomposition again. Perceived personal responsibility and intensive self-coordination create the economic freedom for this. In the old economy, a high effort has to be made for control and coordination, which must be estimated at over twenty percent of the total costs in the construction sector, for example. In the future, these unproductive costs will be converted into productiveactivities within the framework of cooperation and self-control and will also densify work, reduce error rates and allow higher qualities.
Work will also slow down.

6.1.5 Flexibilisation

In the future, work will not be less, rather more – but also worked differently. Rigid boundaries will fall, and extremely flexible working hours will be created. Work is done when work is actually available in the company. In this way, various other activities are carried out or learning or leisure time is taken.
The far-reaching flexibilisation concerns daily, weekly, annual and lifetime working hours. The hatchet of retiring at a certain age will lose its sharpness and make way for smooth transitions even beyond the age of seventy. The strict separation between leisure time and working time is a thing of the past; work tends to become a hobby and a hobby becomes work.
People will engage in several activities at the same time; at least 75 percent will feed their income security from three or even more sources. The dependence on only one source of income and on only one company is significantly reduced. For many people, multidimensionality is becoming the norm not only for economic constraints, but also for reasons of independence, finding meaning and joy.
The market power of workers will grow, as the number of persons in employment will decline dramatically in the vast majority of EU countries due to demographic factors. Com-

panies will enter into fierce competition for "co-entrepreneurs"! Labour force participation will increase significantly, for economic reasons, in order to counteract the shortage of labour. On the other hand, however, higher employment rates for all age groups are also a clear expression of the new importance of work as a source of meaning. Women are experiencing an intense increase in importance, not only for economic reasons (because of a lack of workers), but especially because a new economy depends on their specific characteristics and qualities.

6.1.6 Culture of working life

Determining the substance of one's own culture is the all-important prerequisite for shaping the working world of tomorrow. It is about answering individual questions: "What do I do in this world? What is important to me? Which principles are sacred to me? What values do I pursue that should determine my life?"
Only through the process of an individual redefinition of values and cultures can a good future of the working worlds be shaped. It is a spiritual process: If you want a better world tomorrow, you should not start with the material, but with new thinking. It is crucial that employers and employees see themselves as equal partners and interact with each other on an equal footing. Companies must treat their employees as responsible co-entrepreneurs, give them all support and help.
A basic evil is the devaluation of others in order to enhance oneself. Such behaviour requires rigorous eradication.

The working world of tomorrow already clearly characterizes the conditions and requirements for the future actions of entrepreneurs. Further conditions and needs for the entrepreneurship of tomorrow can be derived in particular from today's economic and social bottlenecks.

6.2 Excursus: Needs of the economy

Today's bottlenecks in economic and social development always characterize the growth areas of tomorrow.

6.2.1 Energy and environment bottleneck

An outstanding bottleneck of today concerns energy, environmental and climate protection. The emerging solutions mainly place particular emphasis on eco-efficiency. However, the principle of eco-efficiency has a fatal disadvantage: it leaves the basic concept of industrial production unchanged. reduction, reuse and regulations reduce environmental impacts and slow down the loss of natural resources; however, these processes do not attack the conceptual errors at their root – they are dead-end solutions. As important as eco-efficiency is at the moment, it must not be overlooked that it only pushes the limits of environmental pollution and resource consumption. Basic innovations with new leading technologies must design products in such a way that

they do not become waste but can be used as 100% as possible after use. The development of such a circular economy requires the highest level of innovation with far-reaching rethinking and redesign.

6.2.2 Bottleneck health

Another bottleneck area today and thus an increasing growth area concerns the healthcare sector, which must not be understood solely as a cost burden on the economy as a whole. The potential of an above-average growth sector of the economy would thus be viewed negatively and possibly suppressed. A growing health sector is a sign of increasing prosperity, which gives rise to a greater willingness individually and socially to invest in the good of health. The higher appreciation for health, a strong ageing of the population and, in particular, a dramatic increase in the number of people in need of care will lead to significantly increased expenditure on medical services, care and support. Medical-technical and organizational innovations in the healthcare industry are of great importance and are growing.

6.2.3 Bottleneck of skilled workers and organization of work

A third bottleneck area, which is still little discussed today, concerns the organization of work and the design of processes for the production of products and the production of services. The growth field of education requires a high degree of innovation and investment. Through far-reaching innovations in personnel and organizational development, companies will have to intensively awaken and use social energy. The broad field of education and organization of work is a first-class growth area.
Closely related to this, information processing and problem-solving capacities have increasingly emerged as a further new limitation, which require intelligence-saving or expanding progress through technical and organizational innovations. In the global world, which is strongly divided by division of labour, ever-increasing amounts of information must be exchanged. On the one hand, the basic innovations of information and communication technologies come as called for, on the other hand, they trigger huge avalanches of information waste. In addition, the abundance and turbulent dynamics of the tasks to be mastered at the same time reach the limits of the problem-solving capacities of a leadership layer that is too thin. Much more all minds must be involved in the acquisition and processing of information. Intensive education must increase the capacity for problem solving and teach the use of technologies created for this purpose.

Mastering the challenges of overcoming the narrow areas reflects in particular the needs of the economy. In order to meet these challenges, corporate cultures must be realigned.

6.2.4 Art of Leadership

Productivity growth is stagnating or increasingly reaching macroeconomic limits. Through self-motivation and passion for action, more and new energy can be achieved

for more productivity. Today's business administration includes technology in management, but not the art of management.
In economic life, values, emotions and intuitions have so far been strongly ignored. However, they describe the power behind the processes, namely the social and personal energy that grows through joy, love and spirit. Business models cannot capture these extremely important factors. They are always an abstraction and pretend that this abstraction is already reality.
This is not against business administration. It is about achieving holistic management with business administration and new orientation, a new culture and radical humanity. Business success is achieved through mental development and lived morality. Spirituality becomes a competitive factor of the first order. The superiority of a company depends on lived spirituality. Written corporate culture, corporate identity, etc. are pointless if they are not exemplified by the managers and supported by everyone. No company can maintain identity and quality in the long run without becoming one with its moral substance.
What is needed is leadership through visions that convey worthwhile goals and generate the same will in the company. The visions will be reflected in the company in the strategic goals, but also clearly in the lived values. The "hardware" of corporate management such as project plans, budgets, performance evaluation, controlling, etc. will continue to be indispensable in the future. Of at least equal importance, however, is the "software", the lived value attitude, which is expressed in the corporate culture with the promotion of identity and enthusiasm, with motivation, generation of the same will, etc.

6.2.5 New rationality

With strong turbulence and rapid pace of change, our world gets into disarray. It becomes inscrutable, and the developments are characterized by a decreasing strength. The complexity is increasing so rapidly that the decision-making centers are increasingly overwhelmed and the greatest bottlenecks in problem-solving capacities arise.
The processes can no longer be rationally justified alone. A good feeling that many things are no longer true with our environment, for example, is enough to act without waiting for scientific explanatory contexts.
A new rationality is required, because

1. the rationality of facts decreases. Companies will therefore increasingly move from an internal orientation to an environmental orientation. In doing so, they will involve as many minds as possible for information acquisition and processing.
2. dhe strategic rationality is decreasing. The markets are becoming more and more fidgety. In a very turbulent world, it will be less and less about realizing plans once created. Rather, any increase in flexibility and creative and innovative potential is required.
3. cadre rationality is decreasing. People no longer simply obey orders and instructions. They want to use their own minds; they want to be involved. What is

needed is a powerful leadership without leading in the sense of orders and commands.

Only with such corporate and management cultures can the needs, wishes and values of the younger generation be met.

6.3 Excursus: Needs of the younger generation

A central question that concerns many companies even before the corona pandemic is:
What human resource management requirements will SMEs have in terms of recruiting suitable trainees and skilled workers?
From a scientific perspective, some considerations can be made, and findings can be shown.
Dealing with Generation Y and especially Generation Z plays a major role in attracting young people in particular to small and medium-sized companies. Generation Z in particular (people born around the end of the 1990s - 2010) sometimes focuses on different values with regard to professional requirements than previous generations. They attach great importance to a healthy lifestyle and have grown up with mobile devices (especially smartphones), which are everyday companions for them, whether in their professional or private life.
For companies and especially for personnel management, leading members of the different generations is a special challenge Different values and attitudes in the generations of employees lead to different behaviours and actions and often cannot be managed productively with a “one fits all” idea without creating tensions and conflicts.
Therefore, in the more recent discussions on the role of personnel management, great importance is attached to taking the different needs of employees from all generations (X, Y and Z) into account. With regard to Generation Z, their expectations of a future employer are particularly emphasized due to the shortage of skilled workers.
Above all, recruiting is about changing its perspective. The company applies to potential applicants or future employees, this is the reverse of the earlier idea when there was no or only a minor shortage of skilled workers.
The special needs of Generation Z can hardly be consistently identified for all young people belonging to this generation. In one of the first comprehensive studies (Gen Y vs. Gen Z Workplace Expectations), the differences between Generation Z and Generation Y were particularly highlighted. The key messages and recommendations for executives in this study are as follows:

6.3.1 Gen Z has more of an entrepreneurial spirit.

17% of Gen Z vs. 11% of Gen Y wants to start a business and hire others.“

6.3.2 For Gen Z, it's not about the money … yet.

Only 28% of Gen Z said money would motivate them to work harder and stay with their employer longer, as opposed to 42% of Gen Y.

6.3.3 Gen Z prefers face-to-face communication over technology.

Gen Z grew up with technology, yet 53% percent prefer in-person communication over tools like instant messaging and video conferencing. (…)

6.3.4 If you're the leader, be honest!

Take note business leaders:

- One-half (52%) of both Gen Z and Gen Y state that honesty is the most important quality for being a good leader.
- The generations agree that after honesty, leaders should exhibit a solid vision (Gen Z 34%, Gen Y 35%), followed by good communication skills (Gen Z 32%, Gen Y 34%).

Let's talk. In person.

- Contrary to the assumption that younger workers want "constant connection" to technology, a majority of Gen Z respondents say they prefer in-person communications with managers (51%), as opposed to emailing (16%) or instant messaging (11%).
- The same trend applies to Gen Y: in-person (52%), emailing (18%), instant messaging (11%).
- And few believe that technology actually enhances personal relationships with co-workers (Gen Z 13%, Gen Y 14%).

Technology is a distraction

- Slightly more than one-third (37%) of Gen Z ranked instant messaging as the biggest work distraction, followed by Facebook (33%) and email (13%).
- Gen Y reports being most distracted by email (31%), Facebook (28%) and instant messaging (25%).

And not all of us like to multitask, after all

- When asked if they like to multitask, just over one-half (54%) of Gen Z responded in the affirmative, while two-thirds (66%) of Gen Y said yes.
- Gen Z is not as inclined to work in a fast-pace environment: 59% of Gen Z report liking a fast pace, while 68% of Gen Y says the same."

In a further comprehensive study, the following characteristics of Generation Z were identified with reference to various studies:

6.3.5 Characteristics of Generation Z

- According to the Institute for Emerging Issues (2012), the Gen Z is the most ethnically diverse and technologically sophisticated generation.
- Gen Z has an informal, individual and very straight way of communicating and social media is a vital part of their lives.
- They are a Do-It-Yourself generation.

- In the study conducted by Dan Schawbel (2014), Gen Z tend to be more entrepreneurial, trustworthy, tolerant and less motivated by money than Gen Y.
- They are more realistic about their work expectation and more positive about the future.
- Based on the findings of Generational White Paper (2011), Gen Z tends to be more impatient, instant minded, lacking the ambitions of previous generations, have acquired attention deficit disorder with a high dependency on the technology and a very less attention span, individualistic, self-directed, more demanding, acquisitive, materialistic and entitled generation so till now.
- Max Mihelich (2013) describes that the Gen Z are very much concerned with environmental issues, very conscious of looming shortages and water shortages which indicates that they have a high sense of responsibility towards the natural resources.
- Amanda Slavin (2015) finds the Gen Z wants to be heard irrespective of their young age.
- Technology is a part of their identity, and they are tech savvy but lack problem-solving skills and have not demonstrated the ability to look at a situation, put in context, analyze it and make a decision (Joseph Coombs, 2013).
- They also appear to be less inclined toward voting and to participating in their communities than earlier generations (Institute for emerging issues, 2015).“

As a further and at this point the last look at Generation Z, the results of a study are cited that compiled some findings on the subject of recruiting and retention that can be found in other studies in this way or similar.

6.3.6 The Gen Z is ready to perform but also has clearly defined desires:

When choosing an employer, the company's image is less important than recommendations about personal surroundings and social media. Overall, the working atmosphere is the most important criterion. Clear tasks, clear boundaries and a strict separation of professional and private life are important. Incidentally, this seems to be a difference to Gen Y, which is more inclined to mix professional and private life.

Also, unlike Gen Y, for whom desk sharing is not a problem, Gen Z seems to want its own, well-equipped workstation.

The possibilities of flexible working hours from home office, job sharing, part-time work (...) remain attractive for Gen Z.

Equipped with a healthy self-confidence in their own technological abilities and aware of the importance of rapid knowledge acquisition, Gen Z expects that their expectations will be met.

They are largely resistant to pressure - such as internal competition - (“If I don't like it, I'll look for something else”). The mobility of young workers is likely to surprise conventional companies. It is therefore to be expected that companies will increasingly have to apply for young employees.

Companies have to ask themselves how they manage and motivate these people, how they optimally use their performance potential and how they reward them for it.

Once again, the mindsets and behavior of Gen Z are likely to rub off on other generations with only a short delay.

6.3.7 Conclusion

Recruiters are advised not to post any employer branding empty phrases on poorly maintained company Facebook accounts. Gen Z expects a highly personal person-to-person dialogue. Companies that do this awkwardly have to expect to give up on social media. "

Special attention to the different expectations and ideas of Generation Y compared to Generation Z for the recruiting process.

With a view to the information and results of the preceding studies, it can be stated that some fundamental differences between the generation and other generations can be seen, which also affect the way in which this young generation should be recruited by the company.

In this context, the topic of digitization plays a very important role in their lives for this generation. Even if it is not to be expected that this generation will have acquired extensive, professionally usable competencies in the field of computer science and digitization technologies due to their previous life, it can be assumed that a large number of private or professionally relevant information and knowledge components are used about digital technologies.

In this context, it is also known, on the basis of the above-mentioned findings, that there is a particular expectation of receiving relevant authentic information via digital media and thus satisfying many needs through the use of digital media.

This plays a crucial role in the exchange between companies and potential applicants and employees and sometimes poses very great challenges for personnel management in companies. Because the expectations of Generation Z outlined above also apply to all processes and activities related to getting to know and receiving authentic information from a potential employer.

This is an essential reason why companies should deal with the topic of digitization of personnel management tasks in relation to recruitment activities. Because in the worst case, they will not reach the interesting target group of Generation Z and / or they will not be able to meet their expectations with regard to the digital exchange of authentic information about the workplace, development and career opportunities, the actual working atmosphere and many other topics. The topic of digitization is therefore directly related to a central task of personnel management.

6.3.8 Conclusion for companies

The following non-selective questions could be considered in the analysis of companies for the recruitment of Generation Z:

- Are we making Generation Z aware of our company with the appropriate (digital) information?
- Are the job profiles in our company also suitable for people from Generation Z or would they have to be adapted once?

- Do we consider Generation Z in our recruiting activities in the company and their expectations of employment?
- Do we have suitable digital information from the company that is interesting or important for Generation Z, e.g., lived values, actual leadership culture, dealing with feedback and criticism, consideration of individual needs for flexible working hours, etc.
- Are our personnel selection procedures suitable for identifying good applicants from Generation Z?
- Does our company have a personal contact for applicants from Generation Z?
- Do we have a suitable generation management system that takes into account the different needs of the employees of generations X, Y and Z during their employment in the company?

6.4 Choice of professional training, further vocational training and field of study

6.4.1 Branch of study

The development, testing and implementation of two different study programmes were decided.

Business Administration and Sustainable Management for SMEs

These study program largely correspond to the conditions of tomorrow's working world. Implementing this degree programme will make decisive contributions to the urgently needed recruitment of skilled workers and entrepreneurs as well as to overcoming outstanding bottlenecks, in particular:

- Energy and environment bottleneck
- Bottleneck of skilled workers and organization of work
- Art of Leadership
- New rationality

Moreover, this qualification and the corresponding professional activity correspond in various respects to a particular extent to the desires and ideas about life of the younger generation.

Management of Renewable Energy Technology in Buildings

The growth field "Energy, Climate and Environment" is addressed, in which on the one hand there is a very high need for action with excellent future prospects for companies and on the other hand a particularly high shortage of qualified managers and specialists can currently be observed.

Activities in the energy and environmental sectors and the use of modern technologies also correspond to the ideas and wishes of the younger generation. By carrying out such tasks, graduates of the dual study program can earn a very good income and at the same time gain meaning.

6.4.2 Occupations for initial vocational training

In principle, for vocational training a large number of different professions can be integrated into the dual course of study. In principle, vocational training of all professions can be integrated into the study programme “Business Administration & Sustainable Management of SMEs”. Commercial professions are naturally particularly predestined.

In the study programme "Management of Renewable Building Energy Technology", vocational training in relevant technical and many craft professions in particular can be integrated, for example:

- Electronics technician for building and infrastructure systems
- Electronics technician for energy and building technology
- Electronics technician for building system integration
- Plant mechanic for sanitary, heating and air conditioning technology
- Gas and Water Installer
- Mechatronics technician for refrigeration technology
- Refrigeration and air-conditioning technicians
- Technical System Planner

6.4.3 Further vocational Training

Continuing vocational education and training must be designed in such a way that it is
a) correspond in content to the respective Bachelor's degree programme.
b) fit in with the occupations of the initial vocational training.
c) can also be carried out independently of the respective degree programmes as continuing vocational training measures.
d) enable a recognised CET qualification in terms of scope and content.
e) serve to overcome existing bottlenecks and meet the needs of SMEs.

According to these conditions, the continuing vocational training program “Sustainable Management” is developed, tested, evaluated and implemented for integration into the study programme “Business Administration & Sustainable Management of SMEs”. The starting point is the existing further training measure in Germany "Kaufmännischer Fachwirt", which is being further developed with regard to sustainable management. The programme will comprise around 450 teaching hours and will end with a recognised official continuing education qualification in Germany.

An important task in energy-efficient building refurbishment concerns the compre-hensive assessment of the buildings, the development of all necessary measures, the preparation of renovation plans, the determination of costs and refinancing op-tions through energy savings and the comprehensive advice to investors. In order to impart the necessary skills, the further vocational program “Energy Service Manager” is developed, tested, evaluated and implemented for integration into the study programme “Management of Renewable Building Energy Technology”. The program will comprise around 350 teaching hours and will end with a recognised official continuing education

qualification in Germany. Official examination regulations with recognised degrees also exist for Estonia and Poland, but here with the special feature that only those who have successfully completed a relevant Bachelor's degree are admitted to the examination. For the BA&VET project, this means that in Poland and Estonia this examination can only be taken after successful completion of the Bachelor's degree, whereas in Germany this further education examination can already be taken during the Bachelor's degree for example, at the end of the third year of study (one year after attainment of the vocational training degree).

In the BA&VET project, a demanding qualification is developed and implemented that integrates three apprenticeships with three independents, recognised qualifications:

- ✓ dual vocational training (EQF Level 4)
- ✓ further vocational training (EQF Level 5)
- ✓ dual bachelor's degree (EQF Level 6)

In the first two years of the four-year training, participants are trained in a company, in a vocational school and in a college/university.
After two or two and a half years, participants take an examination to become a journeyman/skilled worker and thus acquire an internationally recognised vocational qualification.
In the third and fourth year, the qualification takes place in the company and at a college/university.
Towards the end of the third year, the participants take the further vocational examination thus acquire the internationally recognised further vocational training.
Towards the end of the fourth year, the participants take a bachelor's examination thus acquire the internationally recognised bachelor's degrees. In Poland and Estonia is the further education examination "Energy Service Manager" only taken after successful completion of the Bachelor's degree.

In the project's training programs, the further vocational training is fully integrated in accordance with the framework of studies described in Chapter 4 Integral conveyance of vocational master craftsman and bachelor with-in the framework of studies.

During the entire qualification, approximately half of the training takes place in the company and half in the college/university. During the entire training period, the company pays the trainees a collectively agreed salary and annual leave in accord-ance with national regulations.

The integration of initial vocational training into the qualification programme has significant advantages, including:

- With the vocational qualification, the participants receive the admission re-quirements for taking the further vocational training examination.
- Dropouts acquire at least one or two recognised vocational qualification.

Both study courses can be carried out in different Combinations, for example:

a) Implementation without integrating the initial vocational training. Likewise, participants who already have vocational training at the start of the qualification can complete this training. In these cases, attendance of a vocational school is omitted, the training also takes place in the first two years only in the company and the college/university, no vocational training examination is taken, and the graduates acquire "only" a further vocational training degree and a bachelor's degree.
b) Implementation of the dual Bachelor's degree programme with integrated vocational training and achievement of a vocational training qualification and a Bachelor's degree.
c) Implementation of dual Bachelor studies without integrated vocational training and without integrated continuing vocational training and only a Bachelor degree.