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University of Belgrade



Implementation of Dual Education in Higher Education of Serbia

Kraljice Marije 16, 11120 Belgrade 35, Republic of Serbia

email: nzrnic@mas.bg.ac.rs



Faculty of Mechanical Engineering



























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Report 1.1

Analysis of EU and worldwide practices and experiences in the DHE

contacts: Prof. Dr.-Ing. Nenad Zrnić, tel: +381-63-287-193
Dr.-Ing. Žarko Mišković, +381-64-18-32-989

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1. Dual education in the system of higher education as one type of cooperation of higher education institutions and companies

1.1. Introduction

Cooperation between universities, i.e higher education institutions and companies (economy) in the traditional manner of thinking is generally connected to so-called external methods of realization of such cooperation. This would, for instrance, imply cooperation between the higher education institution and companies in working on certain tasks, mostly in development – research projects, or various types of engineering projects for the economy, providing consulting services or courses for knowledge of company employees (as life-long learning programmes organized by companies for their employees) where the company employs a higher education institution for conducting such tasks and signs a contract for that purpose. Sometimes, such cooperation would be conducted based on personal contacts and after the contract and the realization, the cooperation is formalized, whereas there are instrances when higher education institutions and companies (after long-term cooperation) formally upon signed contracts with additional annexed for specific tasks. Furthermore, such cooperation could be conducted if higher education instiitutions hire companies where students perform internships. Sometimes, companies require higher education institutions for referals for recruitment of young graduates (preliminary selection) in order to get high quality empoyees for the company. There are various type of cooperation, but the practices in Republic of Serbia present that mostly there is no direct interaction (there are certain exceptions) among higher education institutions and companies in terms of developing study programmes, curricula and learning outcomes, solving practical problems for companies by working on study projects or graduate, master dissertations etc.

The Higher Education Law of Republic of Serbia (http://www.mpn.gov.rs/wp-content/uploads/2017/12/visoko-zakon.pdf) from 2017, provides ways to institutionalize the cooperation between companies and higher education institutions. Certain aspects of the law practically impose such cooperation. Thus, article 39 of the Higher Education Law defines that internship is one aspect of students' obligations, whereas Article 96 enables higher education institutions to organize internships as a part of study programmes. Article 60 of the Higher Education Law enables higher education institutions to "take advice from employers in terms of cooperation in development of study programmes in line with needs of the employment market". Finally, article 80 of the Law allows for employment of so-called lecturers who are not fully employed to teach professional-applied courses, under certain requirements, which formally legally allows employment of people from companies in teaching. Although most of the higher education institutions had an obligatory students' internship within study programmes, it is

interesting to notice that by employing lecturers who are not employed we actually go back to former Social Federal Republic of Yugoslavia (the former country had a serious economic potential, a significant number of students were granted tuition scholarships from companies) when many higher education institutions employeed so-called “industry lecturers”, or experts from the business environment who participated in teaching and that model of sharing experience was very beneficial. It should be mentioned that there were well-thought out professional internships, for instance the Faculty of Mechanical Engineering in Belgrade had obligatory professional internship upon completion of third and fourth year, by its statute. The professional internship was evaluated by a lecturer, and the grade was a part of the average grade.

1.2. Basic Principles of Dual Education

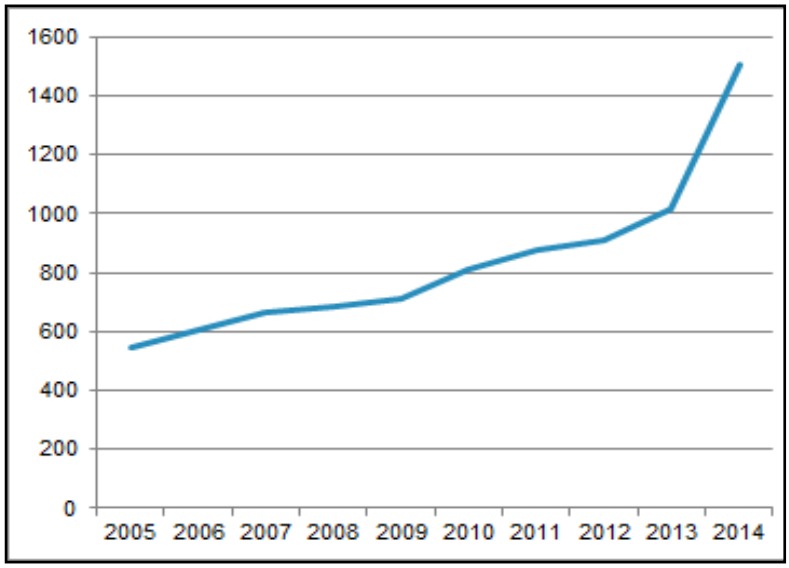
The concept of dual education in our country is regulated by the Law of Dual Education of Republic of Serbia (http://www.mpn.gov.rs/wp-content/uploads/2017/12/dualno-zakon.pdf) which was brought in 2017. However, this Law entails high school vocational education only, not higher education. Some of the previous activities of the government of Republic Serbia, as well as the Ministry of Education provide significant interest for the onset of introducing dual education in the system of higher education in Serbia. This was proven by accepting the structural Erasmus + project in capacity-building called Implementation of Dual Education in Higher Education in Serbia / Dual Edu" (https://dualedu.ef.uns.ac.rs/), with participation from several state-owned and one private-owned higher education institution (University of Belgrade, University of Novi Sad, University of Kragujevac, State University in Novi Pazar, Belgrade Metropolitan University and School of Electrical and Computer Engineering of Applied Studiesfrom Belgrade) and companies from Serbia (Cluster Ni-Kat), as well as foreign participants from five programme countries (France – FORMASUP, Spain – University in Lleida, Austria – University of Applied Sciences Joaneum in Graz, Poland – Private University of Social Sciences in Lodge, Germany –PowMio company from Karlsrue), a partner, or consortium project member is also the Ministryof Education, Science and Technological Development of Republic of Serbia, as well as the National Council of Higher Education. Other than the stated constant participants in the project consortioum, there will be 13 companies as associate partners. The project coordinator is University of Belgrade – Faculty of Mechanical Engineering. DualEdu project presents a beginning of a serious process which should define the frames of the legal regulation for introducing dual education in higher education institutions. The basic idea is to establish a model of dual education in the higher education institutions in Serbia which would be general, as well as flexible and which could be applied depending on the needs of higher education schools which offer applied or vocational education and private universities which do not have budget financed studies, and which are interested to provide knowledge through work-learning in companies for their students, where the work would be valued either by payment of tuition, scholarship or in other manner.

The concept of dual education was started at the beginning of the 20th century at US universities (the first such programme was introduced at the University of Cincinnatti in 1906, when the need for students of mechanical engineering to acquire practical experience in a near-by factory producing mechanical tools was first observed) and further spread to English speaking countries (MIT Boston, 1920). Furthermore, the roots of such education can be found in the successful European tradition of vocational education-learning through work, i.e internship within the second-tier of education (high school), thus initiatives for introducing dual education in higher education started from high schools of vocational type. This was the case in Germany when they formed

Baden-Württemberg Cooperative State University (in German: Duale Hochschule Baden-Württemberg, DHBW), as well as the successor of the Professional Academic of the Federal Unit Baden Wirtemberg (Berufsakademie), founded in 1974 as a new educational institution.

The statistics of the Federal Institute for Professional Education in Germany establishes that the offer of dual study programme is very good. For instance, in the period from 2006 to 2011 the number of dual study programmes increased in more that 50%. In 2014 the number of such dual study programmes reached the figure of 1500 offers. Picture 1 presents the growth of the number of dual programmes offered in Germany in the period from 2005 to 2014 (http://www.wegweiser-duales-studium.de/entwicklung-geschichte-statistik/).

Number of offered dual programmes in Germany



Picture 1. Development of dual study programmes in Germany

According to the data available for 2018 at (https://www.wegweiser-duales-studium.de/fileadmin/user_upload/Inhalte/wegweiser-duales-studium.de/infos/E-Book-Duales-Studium-2018.pdf), it can be observed that all types of higher education institutions in Germany are involved in dual study programmes. From the total number of these programme 64 % are conducted at higher vocational educational institutions, 23 % at vocational academies, 7 % at traditional universities and 6 % at so-called dual higher education institutions.

So far in the EU there have been several projects dealing with dual educarion in higher education. Some of the most significant projects are EU-COOP, Cooperative and Work Integrated Higher Education - CWIHE (https://cwihe.com/, project participants come from Spain, France, Italy, Germany. Austria and Sweden, a total of 7 higher education institutions) and EuroDuaLE - European Cooperative Framework for Dual Learning (http://www.euroduale.eu/, a total of 13 participants from six EU countries, Italy, Germany, UK, Holand, Belgium, Spain, both of them financed within the Erasmus+ project. These projects were prepared in line with the "EU Strategy 2020" (http://www.mpn.gov.rs/wp-content/uploads/2015/08/EU-2020.pdf) primarily with the objective to influence higher education (university professors and associates establish feedback with the economy through their students, they get information about most up-to-date achievement in the economy and thus get an opportunity to modernize their lectures –professors would be likely embarrassed in front of their students in case they teach obsolete issues), research and innovations (smaller companies are often unable to form research-development teams primarily because of lack of staff, where students can become a link which inform companies about achievements from scientific literature, and universities and companies can start cooperation in realization of scientific-research projects), regional development (a local network of companies which participate in dual study programmes, these companies can become better introduced, network and develop possible cooperation), employability of young people (they study and get paid for their work at companies, which is significant for lower-income families who find it difficult to finance the studies of their children) and economic development of countries in regional and global challenges (students learn from experienced experts in companies who give them knowledge and experience prior to retirement, simultaneously providing permanent youth in employability).

In difference from "part-time" model of studies (http://www.metropolitan.ac.rs/ptsche-part-time-short-cycle-studies/), dual studies make professional internship an integral part of their study programmes, which means that there is a contract signed and studying at two different locations – at the higher education and the company. Dual studies are not to be confused with working while studying, when the type of work and the study programme can be different.
Cooperative education, education integrated with work, or dual education (all these terms are used in various countries, however the last term is used in the German speaking countries, as well as other), treat the company as a learning environment for students along with their university. It is a type of learning, or training, with three types of participants: students, universities and companies.

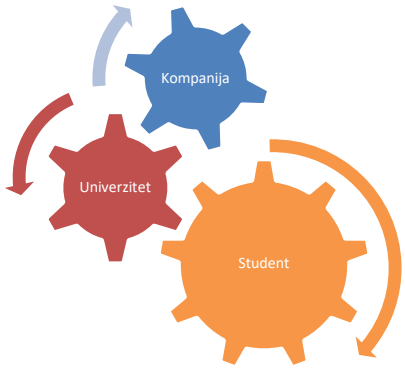
This environment combines traditional method of learning in classroom (so-called theoretical education) along with work in partner companies of universities or higher education institutions (practical education) and innovative processes, as consequences of acquiring experience in companies and work of students in research projects. The curricula are in line in detail, the study programmes fulfill all academic standards. A contract of higher education in dual education is signed with companies where the practical work is conducted. The contract includes, among other things, the salary of students during the practical work in the company. Areas where dual education is mostly offered are: economy, finances and management, technical and engineering sciences, information technologies, health etc. (https://www.wegweiser-duales-studium.de/fileadmin/user_upload/Inhalte/wegweiser-duales-studium.de/infos/E-Book-Duales-Studium-2018.pdf).

The basic objective of dual education can be seen in bridging the gap between theoretical and practically acquired knowledge, as well as fast adaptation to changes in globalized economies. Each student is enabled to have a so-called individual study path ("personalized studying" by articulating theoretical and practically acquired knowledge in the academic year) till a formal degree is acquired, such type of education becomes recognized, salary for work in companies is paid, possibillity of employment in partner companies is offered.
In order to realize programmes of dual education in higher education institutions, first a partnership between companies and universities is established, with precise duties, responsibilities and participation of all partners, precisely defined and compared in both learning environment, as well as clearly distributed expenses of specific educational programmes.

1.3. The role of companies in dual education

Before starting the realization of dual study programmes, a pool of companies interested in hiring students and become directly involved in higher education needs to be formed. It is a certain challenge for the academic, as well as administrative staff at universities since it requires further work, touring companies, explaining the real use of such education to company management, defining their roles, training – mentoring students in companies (in certain countries there is formal training of industry mentors, for instance in France. However, it is not done in Spain and Austria). Still, all the above mentioned activities are not self-sufficient to start this process. Sometimes, it is necessary to present the possible financial benefits to companies, which signifies the roles of the countries. The legislative should be detailed, companies should get more incentives, tax exemptions or state support should be provided. The industry, or the companies, need to transform from their original role from external stake-holder to a partner in the process of education. This transformation assumes higher responbility from companies which assign students with tasks

while performing mentoring students within the company, Picture 2. Finally, there is a possibility for companies to actively participate in designing study programmes at higher education institutions, not in terms of alliging a study programme to the needs of a certain company, but taking the wider situation and future tendencies into account, as well as increasing the competences of students on the employment market.



Picture 2. Stakeholders in higher dual education

Mentoring (tutor) work is the most significant and most critical part in the process of education by universities and companies. It is necessary to provide constant communication of students with both mentors, the academic one, the industry one, as well as between both mentors. The academic mentor needs to provide the academic part of the training of their students to enable them to realize the set tasks in the company. On the other hand, the mentor from the company needs to assist students to fit in the working environment easily and rapidly and to ease the process of fulfillment of the work tasks. For instance, in Lille (FORMASUP) there are three to five annual three-lateral meetings, where the students and both tutors are present, in order to evaluate the progress of the student and identify possible problems. At the same time, all personal contacts enable university representatives and company representatives to get familiar which can lead to further cooperation between the higher education institution and the company.

As for the training of the industry mentors, based on realized study visits within the project Dual Edu, it was observed that there was formal training of mentors at some places (France, Lille), there are places where the mentors are trained with a guidebook prepared by universities (Lleida, Spain), there are places with no formal training of mentors, where they are guided by their personal experience and measures at company level (Graz, Austria).

Per participation level of companies as one of the stakeholders in leading the system of higher education dual education, their role, according to data in the cooperation EU-COOP, it can be strong, moderate and weak (https://cwihe.com/).

- **STRONG (for example, dual education as at** Baden-Württemberg Cooperative State University, DHBW) the role of the company is the strongest in German speaking countries, for example in Germany and Austria, which have a long tradition of professional education through work and internship. In those systems, the company itself selects students, who are employed and present above-average abilities and prospects of promotion and directs them to higher education institutions to get further education. The final decision upon acceptance of students who have applied for a study programme is made by the company.
- **MODERATE** role of companies (for example, dual education as the model applied in France and Austria, where Dual Edu project participants FORMASUP Lille and FH Joanneum, Graz, students enrol a dual study programme, than sign a contract of work with a company coordinated by the higher education institution. In Austria students apply at several companies from the partnership network and advertise a number of work positions each year (some of the companies in the pool do not advertise work positions each year, they follow their needs so the advertisement can come every other or third year). Students submit a motivation letter with a biography and after an interview a final decision of acceptance is made. Most frequently students make a "smart" selection of companies, for instance, distance from their residence, by personal estimates and preferences, prior experience of students, expected salaries etc.
- **WEAK (**so-called cooperative education, for example in USA and Canada), where companies offer and provide work positions, in the period of three to six months, students select companies and apply for work, the job in the companies is integrated with some of the modules in the study programme. This education is based on voluntary work principles (*extended internship") within regular study programmes and at bachelor studies it consists of two to six internships in various companies.

The distribution of work activities between higher education institutions and companies can be regulated in several ways (depending on the type of jobs, sector, geographical aspects – distance between partner companies and higher education institutions) but it needs to be observed that there is no single solution to this issue (**https://cwihe.com/**):

- Students can work from three to six months in a company, and spend the rest of the time attending lectures at universities. This principle is used in USA, Canada, as well as Austria – The University of Applied Sciences FH Joanneum, Graz
- Work in the company which is combined/interrupted with intensive study periods at higher education institutions from one to four weeks with relevant periods of time during the academic year typical for master study programmes, where students have already gained positions with responsibilities in the company

- Work in companies from two to three days per week, the rest of the time attending lectures at higher education institutions. This model can be found in Italy (Free University, Bolzano), as well as in Spain. It is also possible to have students work for eight hours where four hours are spent in the company, and the afternoos are spent at universities attending lectures. There are several study programmes of this type in France (FORMASUP, Lille) and Spain at the University in Lleida. However, the organization of such distribution of the working time of students needs to fulfil certain requirements. It ispossible in bigger cities with developed transport infrastructure and in smaller companies since a fast “mobility” of students is required(**https://dualedu.ef.uns.ac.rs/)**. It allows for alternate change of work environments weekly, monthly or in 40 days.
- By combining the previously stated solutions, there can be an adjustable ratio of attending lectures and work in the company during the study programme. At FH Joaneum, Graz, students spend most of the time during the first three years at the university, then they spend alternate three months at the university and the companies (except for the final semester where they work on the graduating paper), Picture 3. The master two-year dual study programme in Graz requires students to spend more time at companies than at the university, Picture 4. In Italy, students spend all the time at the university during the first year, during the second and the third year they spend 65 % of the time in the company, and 100 % of time of the fourth year is spent at the company.

	Jesenji semestar					Prolećni semestar						
1 & 2	Okt.	Nov.	Dec.	Jan.	Feb.	Mart	Apr.	Maj	Jun	Jul Avg (Opciono)		Sept.
3 & 4	Okt.	Nov.	Dec.	Jan.	Feb.	Mart	Apr.	Maj	Jun	Jul	Avg	Sept.
5 & 6	Okt.	Nov.	Dec.	Jan.	Feb.	Mart	Apr.	Maj	June	Jul	Avg	Sept.

Theory

Internship

Picture 3. Academic calendar for the three year dual study programme "Production Technologies and Organization" at FH Joanneum in Graz

	Jesenji semestar					Prolećni semestar						
1 & 2	Okt.	Nov.	Dec.	Jan.	Feb.	Mart	Apr.	Maj	Jun	Jul	Avg.	Sept.
3 & 4	Okt.	Nov.	Dec.	Jan.	Feb.	Mart	Apr.	Maj	Jun	Jul	Avg.	Sept.

Theory ca. 855 h

Internship ca. 2.120 h

650 h is equal to 26 ECTS (without master) (thesis)

Picture 4. Academic calendar for the two-year dual master study programme at FH Joanneum in Graz

The employment contract between the student and the company is based on general legislative in this domain in every country. Although the benefit from learning in the company and gaining experience for the student is without doubt, the contribution for the company needs to be

valorizated. It is obvious that students are not experienced full-time employees, so their contribution to the work process in the company needs to be evaluated through bringing new concepts and trends to the company, after gaining knowledge about them at universities. For example, in Austria the work contract is signed by students –companies and students-universities. The oral agreement between higher education institutions and companies is considered to be sufficient, given that these two stake-holders are in constant communication. In France the contract is signed between the company and the dual student who has double status: at the same time the students are employees, as well as students. At the same time, a contract is done between companies and the so-called "Center for Training Students" (CFA - Centre de Formation pour Apprentis), which sometimes includes partial financial support for students (along with the support from regional authorities). In Sweden there are no written contracts between companies and universities. Sometimes universities, for example in Italy, define the amount of obligatory sum which needs to be paid to students, the amount is formed upon agreement among universities, unions and companies. The biggest number of universities allows for companies themselves to determine the amount with recommendation that the amount should enable students to pursue their education. In France, the amount for work in some cases are determined by law, depending on age and training level. Based on data gained verbally during the stay of Dual Edu project participants at the University of Applied Arts in Joanneum, Graz, the monthly amount is 600-700 Euro, up to 800 Euro (companies informally balance the amount to an acceptable sum for all participants in dual education).
The evaluation of the work of students in companies ismost often done with direct cooperation between both mentors, the academic and the industry one, in various forms (presentation of what was learnt and done, diaries of tasks performed, description of experience gained, etc). The trust between the participants in the process is of utmost value.

1.4. An example from the neighbouring countries – Hungary

The previous analysis stated some of the experiences in developed countries with regard to dual education. In our neighbouring countries, the most was done in Hungary (Croatia started mapping practical elements in study programmes with the Ministry of Science, Education and Sports, the Employment Agency and the Retirement Fund of Republic of Croatia in 2015 http://bruessel.daad.de/medien/bruessel/veranstaltungen_2015/croatian_ministry_of_science__education_and_sports.pdf). The legal solutions in Romania are equal to our legal solutions at present, namely experts from the economy are enabled to participate in delivering lectures at higher education institutions, graduating papers can be worked on in cooperation with companies, etc.). Hungary as a neighbouring country can be compared to Serbia in many parameters, so some of the reasons and experience of implementing dual education in Hungary will be presented. The primary

objective of the Hungarian government was to improve the higher education system after two decades of dynamic market transition in order to satisfy the needs of the employment market and to increase the competitiveness of the country with cooperation between higher education institutions and local companies. The features of transition in Hungary are connected to be fact that the majority of investors come from Germany. The leader of the positive economiv development is the automobile industry. In the period from 2010 to 2014 there was a full resctructuring of the higher education system in Hungary, both in educational, as well as operational sense (http://www.ocerint.org/intcess16_epublication/papers/230.pdf), by previous careful analysis of German experience, given that the Hungarian higher education system was mostly oriented towards theoretical, less practical knowledge. It was followed by promoting studying the technical-technological sciences and information technologies by authorities. The Hungarian government started the programme of reindustrialization of the country with the objective to increase the part of industrial production from 23% to 30 % in GDP.

The legal foundation for introducing dual education in the higher education system of Hungary was created by the change of the Higher Education Law in July 2014 (http://www.tka.hu/docs/palyazatok/the_dual_system_in_higher_education.pdf), by taking the "German model" as a pattern with adequate modifications and adjustment to national needs. In January 2015, the Council for Dual Education was formed (members come from various ministries, rector conferences, chambers of commerce, engineering chambers, national associations for economy of agriculture) thus approving the start of such programmes, as well as accreditation of partner companies. The study programmes started in the academic 2015/2016 (prior to the formalization of these programmes in 2012 and 2013 there were so-called "pilot programmes" in the field of automobile industry – engineering of vehicles in the duration of seven semesters, with two companies and 25 students participating. Other than one case when a student continued their education abroad, there were no cases of terminating studies. The following year there were programmes in mechanical engineering and engineering management in logistics with 125 students and 25 involved companies). Average conditions for starting dual study programmes in higher education in Hungary were created by a high amount of foreign investments. For example, in 2013, direct foreign investments in Hungary surpassed 15 million euro and around million companies were registered (http://bruessel.daad.de/medien/bruessel/veranstaltungen_2015/hungarian_ministry_of_higher_education.pdf). Most of the foreign investors needed graduates with practical work experience. Companies who participate in the programme, who can create a consortium if needed, have financial incentives in terms of tax reduction and can apply for financial support when purchasing equipment for training of students of dual study programmes. Around 22 million forint (aroung 7.1 million euro) is aimed at support of these programmes in the period from 2014 to 2020. These are the criteria for dual higher education in Hungary:

- Dual programmes consist of studies at universities with 20 to 24 weeks of studying with work in companies annually. The duration of studies with work is at least 80 % when compared to the duration of the study programme
- The study programme must be done in a certain field of higher education established by Law, for example agriculture or technical sciences (engineering)
- Companies or institutions participate in dual education upon approval of the Council for Dual Education formed at national level
- Signed agreement of cooperation between the higher educational institution and partner company which defines the roles and responsibilities of each party
- Curriculum brought by higher education institutions which is the same as the curriculum for the study programme which does not involve learning by working, students attend lectures (theory) along with "traditional students" and than continue with training by working in companies
- Companies pay a monthly salary to students. The amount is defined in the learning contract and is at a minimum of 15 % of the monthly minimal salary, depending on the company, so it varies on a case by case basis

However, during the first academic year when these programmes started, only 40 % of the available positions at dual study programmes with filled and companies reported difficulties in finding motivated and qualified candidates. The other early problems of dual study programmes were found in coordination between universities and companies, lack of adequate literature for students, overworking of students due to lack of balance of curricula, problems with timetables of lectures and work in companies, mentors in companies who lacked training in pedagogy and who were slowly adapting to the new system of education etc.
With time, these problems are slowly overcome, and the whole system of dual education is going towards good direction.

1.5. Conclusion

Dual studies in higher education, as a specific model of studies, have an objectives of increasing the competences of students and their competitiveness on the employment market. They were started in economically developed countries, which is logical. In these countries, due to the fast changes in the social-economic environment, there was lack of matching of skills (especially the so-called "soft skills") and knowledge gained at a higher education institution and those required by employers. It was mostly observed when getting the first employment. The necessity of transforming higher education institutions towards professionalization of higher education can

be a key strategy of many universities, specially from the aspect of the fact that "knowledge is goods", higher education institutions compete in order to attract freshmen which is only possible by following tendencies in higher education and forming new and attractive study programme which enable students to find jobs more easily. The current situation in Republic of Serbia could be stated here. The poor demographic situation led to the number of open positions for freshmen to
be higher than the number of graduating high school students. The immediate future could only deepen this trend which would influence the enrollment policies and sustainability of many higher education institutions in our country. It is obvious, according to tendencies observed in the project EU-COOP (https://cwihe.com), based on experience gained during the study visits in the project Dual Edu (https://dualedu.ef.uns.ac.rs/), that the future will lead to the following:

- More and more professions will demand higher education. Graduates who compete for first employment will be required to have a higher degree of training and "soft skills" in order to be able to satisfy the needs and expectation of employers
- Integrated practical training during studies should be flexible through various types, such as professional internships, summer schools, practical training in companies, as well as dual education
- When creating study programmes, universities will need to take the integration of practical and theoretical elements of study programmes into account
- Integration of practical elements in study programme with cooperation with companies will not end at the level of bachelor and master academic studies, it will spread to doctoral studies, i.e will entail the cooperation between universities and companies at development-research projects. Such is the case at the University of Lleida in Spain where there are so-called "industry doctoral candidates" or employed students who have a salary and perform research for the company which is approved and to a certain degree formulated by the university and the academic mentors, when their doctoral dissertationsneed to satisfy equal criteria as all doctoral candidates (both employed at the university or the company) in terms of publishing research results in leading scientific journals with impact factor
- Globally, it can be expected to see a permanent growth of the number of students who enrol at dual study programmes which can gradually change the awareness which objectively exists in many environments and not small number of members of the academic and scientific community which consider such programmes as not having sufficient quality when compared to traditional ones and show suspicion towards introducing dual study programmes at their higher education institution
- A global concept of dual studies, or taking a single model, cannot be expected (this is particularly significant in Republic of Serbia). National and local contexts need to be

taken into account (expected increase of foreign companies – investors who would open production facilities in Serbia, especially from Germany and other EU developed countries, would undoubtly lead to the necessity of forming dual study programmes in higher education, or a close connection of such companies and higher education institutions,

- Dual study programmes in higher education will not limit the mobility of students in no aspect. Moreover, there is no limit in exchange of such students which could use all the benefits of networked companies which participate in the programme
- Legislation will probably lead to introduction of dual study programmes. In France, large state companies (Electricity of France) with more than 2500 employees have the obligation to employ dual-study students (minimum 5 %). This company employed 6000 dual students in 2016, 88 % of them got employed, 5500 industry mentors worked with them

Dual study programmes will bring substantial benefits to companies which will increase their motivation to participate in them. The key benefits for companies are(https://cwihe.com):

- Establishing close cooperation with universities
- Gaining insight into study programmes at universities
- Insight into potential students and evaluation of prospect employees
- Participation in the process of preparation of future industry experts
- Development of new and innovative ideas
- Providing support for realization of projects
- Development, or creation of new study programmes and projects with universities

Dual education comes with certain challenges or risks. The coordination between attending lectures and learning with work is very complex, students need to be mature and motivated. Some of the key risks stated are (https://www.wegweiser-duales-studium.de/infos/vorteile-nachteile/):

- Insufficient ornon-existing preparation of students for a possible scientific career. Due to the relatively high proportion of practical content in dual study programme, there is little or no room for scientific content. It is almost impossible to expect such students would be in a position to pursue academic career, to become PhD lecturers or work at academic positions at higher education institutions or institutes. It is probably one of the reasons why dual study programmes in higher education are more introduced at universities of applied sciences with vocational training compared to traditional universities which offer academic education

- Students at dual study programmes have a higher workload than "traditional students". Due to the constant change of stages of practical training and studies at higher education institutions, getting a degree demands more working hours than regular study programmes. There is no break between semesters, students waste a lot of time in transport at some universities (Lleida), have annual leave as most employees, around 25-30 days a year, some even less (students in Graz report that employers demand students to work during the "collective summer holidays")
- Interrupting dual studies carries a lot of problems and is not simple. Employers can demand payment of the entire used scholarship or salaries up to than. This financial burden makes some students to be committed to the dual system till the completion, even though they may realize that they made poor choice
- Connection to a certain employer or a company. Namely, the traditional study model allows students to have contact with various companies and perform internship with various employers, determine their own priorities and develop a clear image of what to expect from future employment. Dual students are usually connected to one company. If they evaluate their expectations well, such narrow specialization can become a clear advantage. However, if the student realized that the current situation is not what was expected, it could lead to problems which can still be solved

Creating a favourable economic environment in Republic of Serbia, with some already realized and some announced foreign investments (German companies in the field of automobile industries which could lead to an analogy with the Hungarian case, investments in the IT sector etc.), open a wide space towards formal introduction of dual education in the higher education system of Serbia. With dedication and motivation of the key players in this process, the higher education institutions which need to define an adequare national generic model of dual education and engage in networking with companies interested in dual educarion, the government of Republic of Serbia, the Ministry of Education, Sciences and Technological Development, the National Council of Higher Education and the National Accreditation Committes which need to support the introduction of this education type in terms of legislation, incentives for companies and accreditation standards, along with the Chamber of Commerce of Republic of Serbia and other interested parties, it can be expected that this system can be introduced in the immediate future.

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2. Overview of Dual Education Practices in EU

2.1 Government-regulated VET provision in Germany

Vocational education is offered in full time schools or within the framework of the dual system (duales System) which is the core of VET in Germany. The system is described as dual because training is conducted in two places of learning: companies and vocational schools. The dual system is based on a close cooperation between employers, trade unions and the government. Social dialogue and codetermination are important for reforms to be accepted. The social partners – employers and trade unions – have considerable influence on the content and form of VET to ensure their requirements and interests are taken into account. Responsible action by all participants – beyond each group's particular interests – is a precondition for the efficiency of the dual system. The Vocational Training Act (BBiG) defines which institutions are in charge of supervising VET provision. These are referred to as 'competent bodies' (zuständige Stellen), and play a crucial role at the regional level. They include professional chambers as well as various federal and state authorities. Their tasks are: ensuring the suitability of training centres; monitoring training in enterprises; advising enterprises, trainers and apprentices; establishing and maintaining lists of training contracts; organising the exam system and holding final exams. Each competent body has a tripartite vocational training committee whose members represent employers, trade unions and teachers. These committees must be informed and consulted on all important VET issues and decide on regulations for implementing VET.

2.1.1 VET at Tertiary level education

In addition to higher education programmes (see Section 2.5.3), there are also advanced vocational education programmes in tertiary education that lead to a nationally recognised tertiary level vocational qualification (EQF levels 5 to 7) (i.e., Meister, Techniker or Fachwirt qualifications). Unlike the training regulations for IVET in the dual system, these federally 27 regulated advanced training regulations do not contain a curriculum; however, they do define and describe examinations. Other features which must be specified in the advanced training regulations include (§ 53 para. 2 BBiG, § 42 para. 2 HwO): (a) designation of the advanced qualification, (b) the aim, contents and requirements of the examination, (c) admission requirements and (d) examination procedure. Admission to an examination generally requires a completed course of vocational training and/or appropriate vocational experience. These regulations are laid down by the BMBF by agreement with the competent ministries and following consultation with the primary board (Hauptausschuss) of the BIBB. Advanced vocational training as a Meister entitles the holder to practise a craft trade independently, to employ and train apprentices and opens up access to courses at craft academies, universities of applied sciences (UASs, Fachhochschulen) or

even universities. Data about this programme are not fully recorded in the ISCED-97 statistics for two reasons. First, the examinations do not generally require a participation in a preparatory course. And second, even if a huge number of examinees were to participate in preparatory classes, these courses offered by the chambers are not seen as part of the education system. There is political pressure to remedy this lack of transparency in international statistics and to include all programmes that meet the ISCED-2011 level definition in the near future.

2.1.2 Trade and technical schools

Trade and technical schools are regulated according to state law. Entrance requirements vary by subject area: An applicant normally needs a qualification in a recognised training occupation relevant to the chosen subject and relevant work experience of at least one year, or a qualification from a full-time vocational school and relevant work experience of at least five years. These training programmes, which may be full-time or part-time, lead to a state vocational qualification in accordance with state law. School attendance lasts between one and three years for full-time courses. Trade and technical schools provide qualifications to adopt more extensive responsibility and management functions in the workplace. As set out in the 'agreement on acquisition of the university of applied sciences entrance qualification on vocational training courses' (15), the university of applied sciences entrance qualification can also be acquired at trade and technical schools. These schools (and, in Bavaria, 'specialised academies') exist for the following occupational fields: agriculture, design, technology, business and social care. They end with a final state examination under state law.

2.1.3 VET programmes at health sector schools

Nationally, the two- to three-year programmes offered at the health sector schools (considered as tertiary institutions and under state regulation) consist of approximately two third of theoretical and of one third practical training in hospitals and other healthcare institutions. They are assigned to ISCED level 65 (formerly 5B), because in addition to ISCED 2, work experience and/or a previous vocational qualification are required for admission, both of which are currently classified at level 35 (formerly 3B).

2.1.4 Vocational programmes in higher education

Universities of applied sciences (UASs, Fachhochschulen), dual universities (Duale Hochschulen) and universities of cooperative education (Berufsakademien) also offer dual study programmes (EQF level 6). These all combine two learning venues (i.e., the workplace and the education institution) and are provided in form of three different programmes. The following two dual IVET programmes (16) are the most frequented ones: (a) dual programmes with a training component combine a course of study with practical training in a recognised occupation in a company. In addition to the degree, students obtain a vocational qualification. As a general rule, enrolling in a dual programme with a training component requires a higher education entrance

qualification (Allgemeine Hochschulreife or Fachhochschulreife) and an employment contract; (b) dual programmes with a work experience component combine a course of study with extended practical placements with an employer. Students obtain a university degree but not a recognised vocational qualification. The practical components go far beyond the practice-based semester and work placements of conventional degree programmes. As a rule, enrolling in a dual study programme with a work experience component requires a higher education entrance qualification. In CVET, dual programmes with an employment component are primarily aimed at people who have already completed vocational or professional training and/or have a number of years of professional experience. They are designed to offer further professional development and combine a course of study with professional experience that is directly relevant to the course. No higher education entrance qualification is required. The amount of time the student spends in the classroom and at the place of work is agreed in a contract between the institution, the student and the employer. In recent years, there has been a steady increase in the provision of dual study programmes. Enterprises obtain highly qualified and motivated young workers and institutions of higher education benefit from the extensive contact with the world of work, creating a distinctive image for themselves by offering demand-based courses of study. Students obtain high-quality training that improves their labour market and career prospects, which benefits them both financially and in terms of time. Dual study programmes integrated with training have the following characteristics: (a)alternation between theory phases in the institution of higher education or academy and practical phases in the training enterprise; (b)regulation of practical training in a training, student-employee or unpaid-trainee contract; (c) closely interwoven vocational activity in the training enterprise and acquisition of theoretical knowledge in the higher education institution / academy; (d) close coordination and cooperation between the higher education institution and enterprise. The most common combination is a business management programme plus commercial training, as well as an engineering or computer science programme combined with technical training. There is a wide range of possible subject areas, such as insurance, mechatronics, commercial law, health economy, mathematics and media informatics. The three most common types of venue for dual study programmes are described below.

2.1.5 Universities of applied sciences (UAS)

The course structure and organisation of teaching and study in UAS (Fachhochschulen) emphasise application and focus on the requirements of occupational practice. Out of 381 institutions of higher education, 223 are UASs and other colleges without the right to award doctorates (17). Studying in a UAS requires a higher education entrance qualification (Abitur / Hochschulreife), a subject-specific secondary school leaving certificate confirming such a standard, or a secondary school leaving certificate. Bachelor degree courses usually run for six semesters, with an additional four semesters for a Master's degree. UASs specialises in courses of study in the following fields: engineering sciences, economic sciences/commercial law, social

affairs, administration and administration of justice, computer science, design, mathematics, information and communication technology and healthcare/nursing. In 2014, UAS provided 67% of all dual and initial study programmes (18). For the 2014/15 semesters, there were 219 UAS, both private and public (19). The numbers of students and the programmes of study offered vary widely, leading to particular subject and regional profiles for individual UASs.

The Baden-Wuerttemberg Cooperative State University (dual university)

The Baden-Wuerttemberg Cooperative State University is the first university in Germany to integrate academic studies and work experience and provided 14% of all dual and initial study programmes (20,). It developed from a university with cooperative education status and like other universities, it is simultaneously a legal entity of public law and a state institution. It combines the structure of a university of cooperative education – particularly, the participation of training companies and institutions – with the dual learning principle. The conversion to dual university status means the new institution can award doctorates. One of the main innovations is the mandate to establish cooperative research projects. Collaboration with partner enterprises and institutions can thus be intensified, and steps can be taken to make academic studies more up-to-date.

2.1.6 Universities of cooperative education

Universities of cooperative education (Berufsakademien) are higher education establishments providing academic-focused VET that is simultaneously geared towards practice through a dual training system. They exist in Baden-Württemberg, Bavaria, Saxony, Thuringia and Berlin. Enterprises bear the costs of in-company training and pay the trainee remuneration for training, including for theoretical training in the vocational academy. Depending on the law of the relevant state, enrolling in a vocational academy requires both a training contract and a higher education entrance qualification (Hochschulreife), subjectspecific secondary school leaving certificate confirming such a standard or secondary school leaving certificate qualifying for UASs (Fachhochschulreife). In certain states, applicants without one of these certificates but with a vocational qualification may be granted admission. After concluding a training contract, applicants are registered with the University of Cooperative Education by their training enterprise. Training leads to bachelor qualifications. The most common study courses are in economics, engineering and social affairs. State law normally lays down a period of study of three years. Training in universities of cooperative education takes place partly in accordance with study or training plans drawn up by agreement between the education institution, enterprises and social partners, and also partly through vocational-academic training and examination directives in accordance with framework criteria from the relevant ministries. In October 2004, the Standing Conference of Ministers for Education and Cultural Affairs of the Länder (KMK) decided that training programmes at universities of cooperative education leading to bachelor qualifications should be accredited as equivalent to bachelor qualifications from other universities, thus opening up access

to Master's courses. Equivalence criteria were implemented based on teaching staff and the scope of the theory and practice-based training elements.

2.2 Overview of Italian Legislation

The most relevant legislative document related to Universities in Italy is Law no. 240/2010 concerning the reorganisation of universities. In December 2010, a comprehensive reform (Law 240/2010, or 'Gelmini reform') changed the institutional governance and internal organization of Italian state. The law proclaims autonomy and accountability as its basic principles (Article 1) and provides for changes in three key areas of university administration: governing bodies; recruitment; funding and salaries. Such changes are deeply concerned with the widespread demand for a (new) legal framework regulating partnerships between academia and industry or – better say – society as a whole. As a fact, starting from the change approach proposed by the Lisbon Strategy, by the Bologna Process and by the European Universities Charter on Lifelong Learning, the modernisation and innovation in the Italian University system depends on the response that can be given to social, economic and cultural challenges. This assumption generated the need to identify a third innovative mission for Universities, besides the two traditional missions of research and higher education. In Italy, the public awareness of the importance of the so-called third mission has grown over time. Within the research assessment exercise 2004-2010, the National agency for the evaluation of the university and research system, introduced eight indicators aimed at assessing third mission activities of three types of institutions, including universities.

The Italian version is available at: http://www.camera.it/parlam/leggi/10240l.htm

More recently, the Agency published a 'Handbook for the evaluation of universities third mission', which includes a wider set of activities and indicators. As a fact, each university is called to define its own set of strategies and plans in this field. Continuing education and social engagement alongside technology transfer & innovation are therefore envisaged to play a growing role in reducing the gap between education and employment, to relate "science and society", by encouraging dialogue between the parties, through territorial valorisation and consolidation of the "network" of subjects operating in that area.

A second relevant legislative document is the Italian Legislative Decree No. 104/2013. A core element of the so-called third missions is continuing education. In this regard, it is important to consider the wider scenario concerning the labour market reform process aimed at reducing the high unemployment rate and, in particular, the youth unemployment rate, through a structural revision of public employment services and a simplification of the types of labour contracts. A growing formal role is acknowledged also to universities in the field of education and employment, in line with occupational demands of both students and adult learners and employers. To this end,

Legislative Decree No. 104/2013 has introduced new instruments to strengthen career guidance in secondary schools and a pilot programme (through apprenticeship contracts) for students in the last two years of secondary school.

Another relevant legislative document is the Italian Legislative Decree No. 13/2013. More importantly here, Legislative Decree no. 13/2013, (which follows Law no. 92/2012 entitled "A growth-oriented reform of the labour market") aims at guaranteeing the fundamental and universal right to lifelong learning, defining the basis for a more systematic and strategic approach to lifelong and lifewide learning opportunities and needs, in accordance with the European directives on the recognition of non-formal and informal learning and on non-formal education network systems.

Universities are challenged to play a relevant role in implementing legislative decree n. 13 of 2013, which provides for the general outline of the National System for the Certification of Skills. The cornerstone of the system is the establishment of the National Framework of Regional Qualifications, which serves to organize, aggregate and accord nationwide recognition to over 2,600 regional vocational qualifications. This system is based on the expansion of statistical classifications (economic activity and job classifications) involving a mapping of the labour market and of occupations.

The Italian version is available at: http://www.gazzettaufficiale.it/eli/id/2013/02/15/13G00043/sg

2.2.1 Post-secondary VET

The post-secondary VET programmes were reorganised in 2008 (DPCM 25.1.2008) and mainly aim at developing professional specialisations at postsecondary level to meet the requirements of the labour market in the public and private sectors. There are two different options: • higher technical education and training programmes (istruzione e formazione tecnica superiore, IFTS); • programmes at the higher technical institutes (istituti tecnici superiori, ITS). They are organised by four educational and vocational stakeholders: schools, vocational institutions, universities and companies) The specific course planning is coordinated by the regions and autonomous provinces in the context of the territorial plans adopted every three years and their provision varies across the regions. The IFTS and ITS programmes provide all qualifications available at national and EU level. The Higher Technical pathways (IFTS) IFTS, established in 1999 and then revised to the current configuration defined by the Interministerial Decree of 2013, are higher technical training courses, regulated as follows: 800-1000 hours of courses (of which at least 30% to be spent in the form of internship at a company), at the end of which one obtains a higher technical specialisation certificate - the IFTS with national validity and equal to EQF level 4. IFTS Programming is defined by regions and the autonomous provinces terms of provision, curricula, internship and job placement, within specific planning documents called Three-Year Plans. Three-Year Plans are the instrument through which regions and Public Administration

define their strategy in terms of post-secondary training, therefore they do not relate exclusively to technical training but also ITS and training centres. Local governments are therefore asked to have a full knowledge of their territory and, through an integrated approach, to incorporate both local firm requests and training needs expressed by the territory. Regional programs are defined by the IFTS National Repertory, which is a catalogue of 20 technical specialisations, related to specific professional areas (mechanics, IT, tourism). People can access to these courses holding or not a diploma but the latter ones can do it only following a specific assessment of candidate's skills done by its teachers. IFTS are to be provided by various subjects, among which they have to be necessarily present a school, a university, an accredited training institution and a company that aggregate into ATI or ATS 28 (11) . The presence of the companies and the high number of internship hours are the precondition key to an education closely related to local production system dynamics. The Higher Technical Training Institutes Pathways (ITS) Higher Technical Education is the post-secondary training offer parallel to academic paths. The chain was established by the Prime Ministerial Decree of 25 January 2008 and, as for the IFTS, revised through the aforementioned Inter-Ministerial Decree of 2013. The Higher Technical Institutes (ITS) are classified as 'high technological specialisation schools' that, similar to IFTS, promote a high specialised education in order to offer students attractive technical skills for the labour market. In line with this, ITS programming approach is defined by regional administrations according to their productive and economic characteristics. As it regards course characteristics, they last 4 semesters, in other words 1800/2000 hours of which at least 30% have to be spent in a company as a form of training and 50% of teachers must come from business and profession world. Successful completion of the course leads to a Higher Technical Diploma with an indication of the technological area and the national reference figure, related to EQF level 5. Technological areas identified for ITS, are: • Energy efficiency • Sustainable mobility • New technologies of life • New technologies for Made in Italy (mechanical systems, fashion, food, home, business services) • Innovative technologies for art and cultural activities • ICT. A strong element of distinctiveness compared to IFTS is given by the nature of the party issuing the paths: although IFTS vet providers are a partnership between several entities (schools, training institutions, enterprises, universities, research centres and local authorities), for ITS this partnership must be structured according to Foundation participation model. The motivation of such a governance model is the fact that Foundation ensures greater stability and recognition of the subject by the institutions and territorial actors, as well as by potential students. The two channels share the same cultural approach based on the centrality of technical and technological culture; the connection with the economy and productivity context of the area and the ability to combine in-classroom classical training with direct experience in companies. However, there are even (11) Temporary Association of Companies (ATI); Temporary Purpose Association (ATS) 29 some differentiation elements: the Ministry of reference (Education for ITS, Labour and Social Policy for IFTS) and the governance model adopted (Foundation for ITS, ATI or ATS for IFTS). The recent government regulatory

interventions on labour market and education - Apprenticeship Reform within the Jobs Act (Legislative Decree 81/2015) and the School Reform (Law 107/2015 'Good School') - have on the one hand confirmed the importance and specificity of the technical training and on the other given impetus to the development of the so-called 'long chain of vocational training', in other words an integrated training system that makes the IeFP (education and professional training) be coherent with IFTS and ITS and allows a young IeFP graduate to continue its path of specialisation up to obtaining a Higher Technical diploma. With regard to the school reform, the law allows young IeFP graduates, through the attendance of a higher technical training course, to access to ITS courses. According to legislature intentions, IFTS becomes a fifth year that helps those young people who want to continue their studies and access to higher technical education, which represents the top of the long chain of vocational training. In parallel, the new discipline of apprenticeship identifies one of the possible cases for the apprenticeship qualification and the professional degree in high school and higher technical specialisation certificate. Specifically, the reform allows the employer to sign a three/four-year apprenticeship contract with 15-25 year old people, which is useful to obtain the qualification / professional degree. Moreover, it provides the possibility both for the employer and the apprentice to extend by one year the contract of apprenticeship and thus enabling the young person to acquire a higher technical specialisation certificate. If at central level, it has been worked on defining the legislative framework, it is good to remind the central role of Regions in the definition of both kinds of training through the approval of specific planning documents defined 'Triennial Regional Plant'. So far, with different timing and modalities, IFTS courses have been planned and implemented by a small number of regions: Abruzzo, Emilia Romagna, Lombardy, Liguria, Marche, Tuscany, Puglia, Friuli Venezia Giulia, and Campania. On the contrary, the higher technical education sector, , has had a greater spread though out the country, so much that almost all regions have at least one ITS Foundation(12) . Even though there was a great interest in the qualitative and content aspects of these chains, there is still need to increase the number of participants. In fact so far IFTS and ITS participant number has been low, considering that in last ISFOL IFTS monitoring in 2015 1 500 qualified students were (12) Higher technical education monitoring is entrusted to INDIRE, search public authority controlled by the Ministry of Education. ISFOL takes part in ITS monitoring and evaluation body. 30 registered in 75 programmed courses(13) . In regards to ITS, INDIRE (Istituto Nazionale per la Documentazione, Innovazione e Ricerca educativa- .National Institution for the documentation the innovation and educational research) recorded data, show that there is still a low number of participants, not in line neither with chain potential nor with institution expectations. Since 2010 the total number of students enrolled in ITS courses that have completed their studies is 5 702, of which 4 166 obtained their diploma (14) . To summarise, the work done by institutions creating a system where different training chains could interact, both between them and with school world, represents an essential element that however constitutes a starting point. Improving these aspects is even more necessary if we consider the importance of IFTS and ITS performances in the

occupation field. On this theme ISFOL and INDIRE, as MIUR and MLPS scientific assistants have deepen the analysis on the occupational outcomes of these two chains (in particular ISFOL has analysed IFTS(15) and INDIRE ITS(16)). The analysis underlined the high possibilities for the students graduated from these two chains to enter the labour market and demonstrated how programming high specialised training courses are a useful option for young people as well as an added value for local productive systems.

2.3 Overview of Austrian Legislation on Dual Education

Highest legislative document governing Universities in Austria is Universities Act of 2002 (Leistungsvereinbarungen mit den Universitäten). Due to the autonomy of the universities in Austria the institutions have wide autonomy regarding their activities (e.g study programmes). Also in terms of third mission or any additional activities the universities are rather independent entities. The Universities Act of 2002, which is the leading document to define and describe the universities' missions refers to continuing education especially for the alumni at universities (§ 3, paragraph 5) and to cooperation and use of knowledge (§ 3, paragraphs 7 and 8).

However, in Austria performance agreements have been implemented to govern universities. This is defined in § 13 of the Universities Act of 2002 and continuing education is mentioned under § 13, paragraph 2.1.c and social goals are mentioned is and under § 13, paragraph 2.1.g.

These performance agreements are the most relevant governance instruments to force university activities. This is the only legislative document regarding universities which may have an impact on third mission policies and practices at Austrian universities. The Ministry therefore seeks individual contracts with each university, and among many other issues "third mission".

Parliament Correspondence no. 230 from 16.03.2015 defines that the agreed plans and objectives of performance agreements 2010-2012 were successfully implemented by the universities. The enhanced service level agreements should, in the future and in addition to the core areas of research and teaching benefits, make the universities in the field of social activities ("Third Mission") more visible. The use of indicators for accountability and transparency has become increasingly important to the organization of cooperation between universities and the government. Financing and control are increasingly based on evidence-based data to reflect the performance of universities.

The Universities Act of 2002 (English version) is available at:

http://wissenschaft.bmwfw.gv.at/fileadmin/user_upload/wissenschaft/naric/E_UG.pdf

Example of cooperation and interconnection of those documents is given University of Vienna (German version), including information about the Universities Act of 2002, is available at:

http://wissenschaft.bmwfw.gv.at/fileadmin/user_upload/Studien_und_Berichte/Lurf_2015-JahrderLeistungsvereinbarungs-Verhandlungen.pdf

2.3.1 Dual Education system in Austria

The dual education system, which combines theoretical and practical teaching, is applied in preparing for careers requiring apprentice training as well as in higher vocational schools. Curriculum and training courses are tailored to the requirements of the business world. Apprentices are professionally trained in companies or gain on-the-job experience within the context of internships.

In Austrian education, joint projects are often carried out by schools working together with the business community, such as diploma projects focusing, for example, on the practical implementation of research and development findings.

This two-pronged approach is considered to be exemplary throughout Europe and is a key factor underlying the success of Austria as a business location. Foreign investors highly value the specialized skills and the sound, fundamental know-how of Austrian employees.

In order to further build upon these high standards, Austria invests 5.8% of its gross domestic product on education.

In addition to focusing on gaining practical experience, the Austrian educational system attaches considerable importance to specialization. This not only takes place at universities or during a person's studies, but beforehand at school. Students always have the opportunity to specialize, whether at higher secondary technical, polytechnic or business schools. For example, the Polytechnic Secondary School for Mechanical Engineering offers more than ten different courses of study. Three quarters of all Austrians take advantage of this offering in the school system and successfully complete a secondary school education.

2.3.2 VET analysis

High youth unemployment rates, skilled labour shortage, skills mismatches, and difficulties in the transition from education to the labour market have all raised interest in dual VET programmes (**[1]**), both at European and Member State levels.

([1]) Dual training is characterised by alternating school-based and company-based training stages.

As a result of demographic changes, the heterogeneity of apprenticeship beginners, competition from school-based VET programmes, and image problems, apprenticeship training has come under increasing pressure in recent years. However, statistical analyses and a survey among Austrian apprenticeship diploma holders about two years after graduation ([1]) reveal the many advantages of apprenticeship training: high satisfaction among apprentices with their

training, smooth labour market integration, and comparatively (with the rest of Europe) low youth unemployment.

Apprenticeship training not only makes it considerably easier to enter the labour market but also has positive effects on employment satisfaction. Some 85% of apprenticeship graduates are employed at skilled worker level – in line with their qualification – two years after being awarded their diploma. Another 11% are already employed in an executive position. It follows that 96% assess integration in their company as positive, while 95% also enjoy their occupation. Most apprenticeship graduates rate their training in the company and at part-time vocational school as positive, and consider the content of training as highly usable. Around 85% would choose apprenticeship training again as their initial VET pathway.

Apprenticeship training boosts its graduates' professional careers and reduces their risk of becoming unemployed, particularly in comparison with dropouts. While 80% of apprenticeship graduates are employed three years after successful graduation, only 38% of dropouts are still employed three years after their training. The likelihood of finding a place of work also increases with training success: the more successful graduates are in the exam to finish apprenticeship, the higher their share among the self-employed and people in dependent employment, and the lower their share among the unemployed. Although there is often criticism that career decisions need to be taken at a young age in Austria (choosing one of several education and training pathways at the age of 14), the collected data supports this early entry into apprenticeship. The older apprenticeship beginners are when taking up training, the more likely it is that they will drop out: 7.4% of apprenticeship beginners who were 15 years old when taking up their training dropped out in the survey period, while the share of dropouts among 25-year-olds was as high as 36.5%.

The fact that youth unemployment is comparatively low in Austria is attributable to the success of dual VET together, with a differentiated range of school-based VET programmes. At 10.6% (based on Eurostat), youth unemployment in 2015 was in the second most favourable position (behind Germany) and well behind the European average (EU-28) of 20.3%.

2.3.3 Structure of the education system and VET in general

The nine-year compulsory schooling period in Austria starts with attendance of the four-year primary school (cf. Fig. 8). At the lower secondary level, pupils have the choice between two four year school forms: the lower level of academic secondary school and new secondary school (into which the previous general secondary school was integrated). After lower secondary school, learners need to complete another school year to complete their nine years of compulsory schooling. This can be completed, for example, by attending the one-year pre-professional training at pre-vocational school, which focuses on familiarising pupils with the world of work and deepening their general education. Pre-vocational school is mainly attended by those who want to continue in a dual VET pathway.

Dual VET is one of four options open to students at upper secondary level. Whereas dual VET can only be started upon completion of the nine-year compulsory schooling period, the other pathways can be started immediately after the lower level of academic secondary school or new secondary school. One of these options is the upper level of academic secondary school. This level is completed after four years with the upper secondary school-leaving exam and the matriculation certificate, which gives access to all tertiary establishments. The other two options are the VET tracks school for intermediate vocational education and college for higher vocational education (the latter of which is completed with the matriculation and diploma exam). This means that, together with dual VET (apprenticeship training), learners have the choice between three VET pathways at the upper secondary level (for more details, cf. the text below).

Learners also find a large number of VET programmes in the post-secondary, non-tertiary sector (cf. Fig. 8). These mainly serve to provide further and higher qualifications for holders of initial VET qualifications. The "classic" tertiary sector with universities, universities of applied sciences and university colleges of teacher education focuses on providing academic/knowledge-based education, with vocational elements being increasingly integrated in recent years in order to enhance the employability of its graduates.

2.4 Overview of policies and legislation in UK

Higher Education Act 2004 is the highest legislative act governing higher educaton. Higher Education in the UK was for many years government funded for a small number (around 10%) of high achieving school leavers. At the beginning of the 21st century, the Labour Government aimed to increase higher education take up to around 50% of school leavers, with an increased level of funding directly from students, and an increasing legislative provision for lower income students and applicants from diverse social backgrounds (a policy of Widening participation). The recent Higher Education Act from the conservative government raised the level of student payments (approximately threefold) whilst reducing government subsidies.

The Higher Education Act 2004 is available at:

http://www.legislation.gov.uk/ukpga/2004/8/contents

Access top Higher Education Policy: Following the move towards self-financing for institutions, in the HE Act 2004, this policy has sought to increase the level of competition between institutions through for example, creating a wider base for awarding degree programmes, and revising the student repayment mechanisms. Further support was made for widening participation.

Access top Higher Education Policy is available at:

https://www.gov.uk/government/publications/2010-to-2015-government-policy-access-to-higher-education/2010-to-2015-government-policy-access-to-higher-education

BIS committee response: Further policy and reports from the UK government have identified the need for closer collaboration between Universities and Business organisations, particularly around issues of skills, access to higher education, and Science and technology innovation.

BIS committee response is available at:

https://www.gov.uk/government/publications/business-university-collaboration-government-response-to-bis-select-committee

2.4.1 Initial Vocational Education and Training (IVET)

Further education institutions include sixth-form colleges, tertiary colleges and further education colleges (both general and specialist). Colleges of further education provide both IVET and CVET, catering to young people and adults. Most offer academic and general courses (such as A-levels) and vocational ones, and some also offer degree courses; Scotland offers highers and advanced highers. According to the UCAS (Universities and Colleges Admissions Service) annual datasets, in 2004, FE institutions in the UK supplied 42 % of students for higher education. In higher education, universities and other institutions provide initial vocational education. In addition to three- or four-year first degrees, masters and doctorates universities offer a wide range of shorter courses including two-year higher national certificates and diplomas (HNCs and HNDs) and foundation degrees.

Vocational education and training at tertiary level After gaining A-level qualifications with three good grades, students can go on to universities and other higher education institutions. Universities set out their own admission policy. In the UK there is no separate identification of vocational higher education. Most institutions offer both vocational and general courses, although in differing proportions. There is a wide choice, with some 50 000 degree and non-degree courses available through the common application body (Universities and Colleges Admissions Service, UCAS). The sector includes 91 universities, as well as colleges of higher education (HE), and specialist institutions, e.g. for art and agriculture. Higher education courses are also increasingly offered in further education colleges, particularly in Scotland where higher national certificate/diploma (HNC/D) courses have attracted socio-economic groups underrepresented in traditional HE. Widening participation is a key aspect of UK policy. It is based on social and economic priorities. Universities assess the merit of applicants and take decisions on that basis. A-levels (normally, three with grades A-C) are the traditional route to higher education for young people.

However, many alternatives are often accepted, including vocational qualifications at a suitable level. Some HE institutions provide foundation and access courses for students who do not possess the relevant entry qualifications for their chosen degree course. Performance at interview, work

experience or other factor may also be taken into account in assessing merit. In the UK, academic qualifications are not national awards but granted by individual institutions. Qualifications below the level of honours degree include higher education certificates and diplomas (HNCs/HNDs) and foundation degrees (FD). Sub-degree qualifications Until the introduction of foundation degrees in 2001 (not Scotland), the most usual sub-degree HE qualifications were the higher national certificates and diplomas (HNCs and HNDs) in a huge number of subjects, which are vocational qualifications in their own right. HNDs are normally offered as full time, two year courses or through a part-time route, with HNCs 35 normally two years part time. HNC/D students can progress to degree courses. Of part-time students, 45.6 % were studying at sub-degree level in 2003/04 (19). A wide range of HND courses are on offer, particularly in Scotland, with some involving a combination of college and workplace learning. The highest uptake for these qualifications in 2003/04 were in agriculture and related subjects, architecture, building and planning and creative arts and design (20). Foundation degrees (FDs) Introduced in 2001 in England and Wales, foundation degrees are a part of the government's strategy for increasing participation in higher education. Nearly 38 000 students are studying for FD in 2004/05. FDs are designed in partnership with employers at associate professional or higher technician level. The range of part-time and full-time courses, distance learning, learning in the workplace and learning through the Internet makes FDs more accessible to people. Many FE colleges are involved in the delivery of these courses. If studied full-time, the average time taken to complete a FD is two years. All FD courses can contribute towards attaining an honours degree, which can be completed in a further 15 months (full-time study or equivalent part-time). The highest uptake for these qualifications in 2003/04 were in education, business and administrative studies, social and computer studies, and engineering and technology (21). Honours and post-graduate degrees Bachelor of arts (BA), Bachelor of education (BEd) and Bachelor of science (BSc) are modular with a compulsory common core. Courses usually last three years. Some courses last four years, involving placements in industry or periods abroad. Courses usually include a project or dissertation based on independent research. In Scotland it is normal for students to achieve an Ordinary Degree after three years and a more specialist Honours Degree after four years. Master's degrees (Master of arts, Master of science, etc.) are post-graduate courses and may take one year full time or two years part time (see Glossary). They are usually self-funded; entry is dependent on results at bachelor level. Some post-graduate courses (e.g. Post-Graduate Certificate in Education) are below Masters level and are intended to provide preparation for a specific occupation, following completion of a general degree. Entry to a Doctorate (PhD) is dependent on results at either Masters or Bachelor level. Students must gain funding for PhD. They take at least three years to complete.

2.5 Background and governance of VET in Portugal

In 2000, a set of policies were framed to tackle the traditional underperformance of learners and the low level of educational attainment by: (a) creating a system of recognition of prior learning (RVCC); (b) developing measures to combat the high dropout rates at lower secondary level; (c) elaborating adult education policies. The process for bridging the traditional gap between education and professional training then begun. In 2007, the National System of Qualifications (19) (Sistema Nacional de Qualificações - SNQ) launched the current qualifications system in an attempt to get aligned with the EU policies. Its objectives are listed below (see Box 1). The SNQ framework is based on a balanced relationship between VET within the educational system and VET in the labour market. It establishes common objectives and instruments, developed over the years and complementary tools to sustain the implementation of the policies, including the National Qualifications Framework (QNQ) (see Section 3.2). Under the SNQ, successful completion of VET programmes grants a double certification, i.e., an education diploma and a vocational qualification level within the QNQ. The QNQ (20) is in line with the European Qualifications Framework (EQF). Double certification allows: (a) promotion of the parity of esteem between general education and VET; (b) open educational and training pathways, thus; (c) increased VET attractiveness.

https://dre.pt/web/guest/legislacao-consolidada/-/lc/34556675/view?q=Decreto-Lei+n.%C2%BA%20396%2F2007 (link to the consolidated legislation).

2.5.1 Post-secondary non tertiary education VET

Technological specialisation programmes (cursos de especialização tecnológica - CET) These programmes are characterised by a combination of general, scientific and technological components in school with work-based learning and are composed by 60 ECTS. Usually they last approximately one year (1 200 to 1 560 hours) and award a QNQ level 5 and a technological specialisation diploma (DET). These programmes are developed in collaboration with the training institution and the enterprise, other employment organisations, associations of enterprises or socio-professional associations, amongst others, and can adopt different types/methodologies of training, including traineeships. The CET diploma allows learners to apply to higher education through a separate entrance/admission procedure determined by a broader regulatory framework, and following the requirements for entry set by each academic institution. Training held at the CET will be credited in the higher education programme. (b) Higher professional technical programmes (cursos técnicos superiores profissionais - CTSP) Launched in 2014, these programmes comprise the following components: general and scientific, technical, and on-the-job training, which takes place through an internship (lasting at least one semester and granting 30 ECTS). They run for four academic semesters, with 120 ECTS and award a diploma of higher professional technicians. These programmes are provided only by polytechnic institutions. Each institution provides

programmes in the areas that should meet the region's needs. Holders of these diplomas can access the 1 st cycle of higher education programmes or integrated master programmes through specific application procedures, leading to a high education degree. In 2016, these programmes integrated the higher education legislation (25).

2.5.2 Higher education: universities and polytechnics

Higher education is structured according to the Bologna principles and is divided into university and polytechnic education. Pre-conditions to enter higher education include successful completion of a secondary level programme or a similar qualification level, admission exams and specific requirements concerning the area of study. Candidates over 23 years of age who do not comply with the above conditions may be submitted to specific entrance exams to show evidence they have the competences to enrol in the selected field of study. Universities and polytechnic institutions grant 1st cycle degree (licenciatura, QNQ level 6) and 2nd cycle degree (mestrado, QNQ level 7), and integrated master programmes which comprehend the 1st and 2nd cycles (mestrado, QNQ level 7), whereas PhD degrees (25) Decreto-Lei (Decree-Law) n.º 63/2016, de 13 de setembro. 21 (doutoramento, QNQ level 8) are granted by universities alone. This level of education is both funded by the state and by the payment of tuition fees.

2.5.3 VET for adults

Education and training programmes/courses for adults (cursos de educação e formação para adultos - EFA) Launched in 2000, these courses/programmes (either of certain modules or for a full qualification, according to need) are available for people over 18 who wish to complete the 3 rd cycle of basic education or secondary education and/or obtain a professional qualification (QNQ levels 2-4). EFA are organised in a lifelong learning perspective; in training paths, defined through an initial diagnostic assessment, carried out by the training provider or through a process of recognition and validation of the competences acquired throughout life. Training programmes are developed in an integrated way, comprising basic training and technological training or only one of these; and are offered in the form of modular training, based on a training standard/referential under the CNQ. Training is centred on reflective processes and on skills acquisition through a module entitled ‘learning with autonomy’ (aprender com autonomia leading to a basic level of education diploma and/or professional qualification) or a reflective learning portfolio (portfólio reflexivo de aprendizagens, leading to a secondary diploma and/or professional qualification). Adults who hold the 3 rd cycle of basic education diploma of an EFA programme and who want to pursue their studies can attend an EFA programme at secondary level or enter into a process of recognition, validation and certification of competences to obtain the secondary education diploma. Adults who hold a secondary diploma of an EFA programme can continue their studies in a technological specialisation programme (CET) or in a higher level programme, under the

conditions defined by the higher education legislation. (b) Certified modular training (formações modulares certificadas) Certified modular training is included in the CNQ and is available since 2008 for people older than 18, who do not have the adequate qualification to access or progress in the labour market or have not completed basic or secondary education. The modular training enables learners to create or to follow flexible learning paths with variable length, according to their own needs. The curricula organisation of modular training is based on training units of short duration (unidades de formação de curta duração - UFCD) available in the CNQ. Modular training composed of UFCDs integrated in a training standard/referential associated with QNQ level 2 is intended primarily for adults who have not completed 3rd cycle of basic education. Similarly, UFCDs associated with QNQ level 4 are intended only for adults with equal or higher than the 3rd cycle of basic education. The duration of a modular training course may range from 25 to 600 hours. Whenever a course exceeds the duration of 300 hours, one third the UFCDs are required to include the basic training component. 22 (c) Prior learning process (processo de reconhecimento, validação e certificação de competências - RVCC) The RVCC process comprises the identification of formal, non-formal and informal competences developed throughout life; through the development of specific activities and the application of a set of appropriate evaluation tools (see Annex 13). There are two different paths (educational and professional) to recognise competences acquired by adults through lifelong learning. One of the tools used in the RVCC process to evaluate the candidates is the reflective learning portfolio (portefólio reflexivo). It is a written record of the candidate's competences acquired throughout life presenting a critical appraisal of his/her knowledge and competence development, as well as explaining and organising prior experience and education. It includes relevant supporting documentation in relation to the different areas of the portfolio. Validation of these competences is done under the referential framework of key competences elaborated by ANEQP. The certification of educational competences is awarded after a jury decides that the candidate has demonstrated a self-directed review of their knowledge, skills, and competences in the different areas of key competences of the related referential. The educational RVCC process aims at obtaining a QNQ level 1, 2 and 3. This reflective record also includes supporting documents and other supporting evidence that demonstrate the competences and the professional achievements of the candidate. Implying a self-evaluative and critical view, this tool greatly depends on the profile of the candidate. The certification consists in a practical demonstration before a jury that allows for the assessment of proficiency held within the framework of professional competencies. The professional RVCC process aims at obtaining a professional qualification at QNQ level 2 and 4. These processes are under the responsibility the Qualifica Centres, managed by ANQEP. Currently there are around 260 centres spread all over the country that provide adults this service.

2.6 Dual Education Governance and Example in Poland

The law on higher education in Poland distinguishes two types of higher education institutions: academic and vocational (uczelnie akademickie i zawodowe). The second type offers first (Licentiate degree) and second (Master's degree) cycle study programmes as well as uniform master's studies, but not doctoral programmes. The 'higher education vocational schools' are also not obliged to conduct scientific research and educate academic staff. Apart from higher education institutions, colleges of social work (kolegia pracowników służb spoecznych) offer three-year programmes at ISCED 5 level (11) for the occupation of social worker. In 2014/15, there were seven colleges of social work with 463 students (85% of whom were women).

2.6.1 Examples of Implemented Dual Edu System on WSB University

We will analyse three different approaches implemented on WSB. First is so called „3 days of study, 2 days of work".

In this system we have **Full time mode classes** from Wednesday to Friday, Stages of practical preparation in this approach are:

1)Meetings with are cruiter (representative of an agency, recruitment, personal consulting or job placement)–presentation of the work specific character in different industries;

2)Training that enables gaining interpersonal competences and at the same time activates students on the labor market (career planning, active job search methods,modern recruitment methods, interpersonal communication and in a team, self-presentation);

3) vocational training (business ethics, business and academic correspondence, computer software support);

4) meetings with experts,

5) study visits,

6) career coaching

7) apprenticeships

Second model is based on approach were courses and specializations are conducted in cooperation with the representatives of enterprises from agiven sector (IT, Logistics, Transport):

Study curriculum designed by employers

Workshops with entrepreneurs,

PBL(Problem-Based Learning) method, case study,

Thesis as apractical project commissioned to the student by the company,

The enterprise is the student's workplace.

Third model is based on specialization conducted in cooperation with Torlogistics company. Every semester of study includes lectures (taking place at university),classes and workshops (taking place in the company), after the first,second and third year of study, the student takes a three-month internship in the company, the internship program is suited to the content in the course in a given academic year.

„Dual studies –strategy, quality, models –case study of WSB University“ dr hab. Katarzyna Szczepańska-Woszczyna, prof. AWSB

2.7 Dual Edu Education in Slovakia

There is the law that regulates dual education on high schools or secondary schools (typically 15-19 years old students). It was adopted in 2015 (Act no. 61/2015 Coll.) and it is focused on vocational schools. The Slovak Republic, specifically the State institute for vocational education, even has EU project on dual education and support of the attractivity of the vocational education. The project is funded within the operational programme Human Resources and its budget is cca. 33 500 000 €. The period of the project is 2016-2020.[1] The goal of the project is to implement the system of the dual education into the suitable fields of education.

However, the situation is a little bit more complicated with universities and higher education institutions. The law no. 131/2002 Coll. does not use the notion “dual education” but it speaks about “practical education” and “vocational practice”. Practical education is the part of education that may be performed by the school itself, by the legal person established by the institution or it may be conducted by the private institution etc. based on the contract with the respective school or university. The same with less strict delimitation applies to vocation practice. The law frequently speaks about the clinical practice or clinical experience for students of medicine. This means that the law provides the space even for more genuine dual education which is on the rise. There is currently only one study programme accredited by the competent committee as explicitly dual education programme. One of the top universities in Slovakia, Slovak University of Technology in Bratislava, Faculty of Mechanical Engineering opened the 4 years long bachelor’s degree (3 years is the typical length in Slovakia). The degree is called vocational bachelor’s degree. It is run with the cooperation with car producers mainly Volkswagen Slovakia. The programme

was open for applications firstly in 2017.[2] The organisation of studies differs from the regular bachelor's degree in such a way that the third year of studies is spent in the company and the fourth year is dedicated to thesis where the experience gained previously shall be used[3]. Based on work results the students may also be given the position in the company as soon as they graduate. The programme provided by the Slovak University of Technology is the pioneer in the field of the dual education on level of universities and higher education institutions.

[1] http://www.dualnysystem.sk/Oprojekte.aspx

[2]https://www.sjf.stuba.sk/buxus/generate_page.php?page_id=6026;http://vedanadosah.cvtisr.sk/dualne-bakalarske-vzdelavanie-vautomobilovom-priemysle

[3] http://www.teraz.sk/ekonomika/sr-studium-projekt-duelne-vzdelavanie/279047-clanok.html. For example, general information about the dual education at the level of high schools is here: http://potrebyovp.sk/dv_v-praxi

Here is the official website of the professional bachelor's degree at SUT: https://www.sjf.stuba.sk/buxus/generate_page.php?page_id=6026

Here is data about the number of student and couple of words from the dean and some students: https://www.sjf.stuba.sk/buxus/generate_page.php?page_id=6026

2.8 Higher education system in France

As part of the process of harmonising higher education curricula in Europe, the national framework for higher education degrees is structured around three levels: Bachelor degree, Master degree and PhD (Licence-Master-Doctorat - LMD in French). Alongside, there are also two-year technology degrees: the DUT and the BTS. DUT: (Diplôme universitaire technologique - Undergraduate certificate of technology) (62) (EQF level 5) is a two-year vocational degree open to people with a baccalaureate or equivalent. It offers training in 24 specialities .Preparation for a DUT is provided by IUTs (university technology institutes) attached to universities. These qualifications prepare people for technical and professional management roles in certain sectors of production, applied research and the service sector. It is also possible for students to pursue their education, for example towards a Bachelor degree.

BTS: (Brevet de technicien supérieur – advanced technician certificate) (EQF level 5) (63). Study for the BTS takes place in the advanced technician section of a so-called vocational lycée. This course, open to people with a baccalaureate orequivalent, provides specialist education and

training. It includes one or more internships. It gives access to a two-year professional qualification. It offers training in 88 BTS specialities, across all fields. While the purpose of the BTS is immediate entry into work, it is nevertheless possible to continue studying, in particular towards a vocational Bachelor's degree.

The Bachelor degree (Licence) -EQF level 6 is a national higher education qualification awarded after six semesters (3 years) at university, following the baccalaureate or via the accreditation of work experience (VAE). It is available in virtually all disciplines and sectors of activity. The academic and vocational programmes begin with a common multidisciplinary core subjects. The curriculum then becomes gradually more specialised. Students have the option to make final choice on their educational direction at several stages in the course. Once they have obtained their degree, students can then apply to enter the Master programme.

The vocational Bachelor degree (Licence Professionnelle) (64) is a national qualification issued by a university. It is open to people with a baccalaureate, but also those who have obtained post-baccalaureate qualifications, such as a BTSor a DUT. It requires two semesters of study (one year), and combines theoretical and practical learning, learning about methods and tools, a 12-16 week work placement and the completion of a supervised project. The vocational Bachelor degree was designed to allow people to move directly into a profession. It relates to European undertakings on the provision ofa degree course that reflects the demands of the labour market in Europe and to the need for new qualifications between advanced technician level and advanced executive-engineer level.It enables students who wish to acquire quickly a professional qualification corresponding to clearly identified needs and jobs.

http://www.education.gouv.fr/cid2573/la-voie-professionnelle.html

L'apprentissage (Apprenticeships). Report by the French Education Ministry [in French] http://www.education.gouv.fr/pid37/apprentissage.html

https://franceintheus.org/IMG/pdf/education_system.pdf

2.8.1 Apprenticeship in region Hauts-de France

This region is established by merge of two regions since January, 1st 2016. Region have population of 6 millions and budget of the Region of 1,8 billions €

Main skills in need are in fields of: Economic development, Transport. High schools, Professional training, Apprenticeship

The apprenticeship plan set up in 2016 by Région Hauts-de-France taking in account that: Companies resort too sparsely on apprenticeship (less than 4% of them); An important youth unemployment rate and a number of apprentices still too low for the youngest region of France; Some professions are in lack of candidates; Available places in CFA; Fight the bad image in families and young people minds; An orientation still often by default; A necessary adaptation to changes in the professions and the needs of employers. Implementation of this plan give results in form of 35389 aprenticeshipsin 49 CFA and issuing more then 600 diplomas or certificates. Detailed informations are available on following link.

www.hautsdefrance.fr/apprentissage

APPRENTICESHIP IN REGION HAUTS-DE-FRANCE, Power point presentation

2.9 Spain Education Governing Documents

Education in Spain is regulated by the 2006 Education Act (21) (LOE) and the 2013 education reform Act (LOMCE) which aims to improve student performance and curb early school leaving. LOMCE implementation started in 2014/15 and is expected to be fully implemented by 2017.

Tertiary education includes vocational (ISCED 5) and academic programmes (ISCED 6-8). Higher VET programmes' (ISCED 5) duration is 2 000 hours in two academic years. These studies lead to a Higher Technician diploma giving access to related university studies (ISCED 6-8). University studies (ISCED 6-8) include bachelor, master and PhD programmes. The flexibility of the system not only affects the vertical progression in VET, but also the horizontal flow between different educational programmes: students awarded a basic VET diploma may obtain the ESO diploma. Equally, students awarded Intermediate VET Diplomas may obtain the Bachillerato Diploma by passing the relevant core subjects of Bachillerato. In addition to these, the education system provi

2.9.1 Dual VET or apprenticeship and their role in Spanish Education System

In recent years, a great effort has been made to introduce and develop alternance training models, dual VET, to promote youth employment and 25 acquisition of a vocational qualification. Various regulations have been passed aiming to strengthen the links between companies and VET providers, to bring them to work together and to encourage greater involvement of students in the labour market during their training period. In Spain, dual VET is shaped into two forms: (a) training and apprenticeship contracts, which can be delivered by the education and employment

systems; and (b) dual VET projects offered within the education system and implemented by the regions.

2.9.2 Dual Primary education Bachelor Degree Universitat de Lleida

This system is established in cooperation between regional government and university. Main aspect of the program is that student 60% of time spend on university while 40% in the school. Training time in university is based on analysis, studying, explaining, projecting and planning, while time in school is based on teaching, experimenting, testing, collaborating and observing.

While teaching in university s delivered by university staff, teaching in school is delivered by school mentors. School mentors deliver trainer's skills, practice analysis and accompaniment. Implementation of this system provided insight in future challenges in the form of improving mentoring system and integrating different learning.

Dual Primary education Bachelor Degree, David Aguilar, Academicsecretary; Jordi L.Coiduras,Degree coordinator

2.10 Overview of policies and legislation in Switzerland

Swiss Dual System is a dual based join effort of training companies and vocational trade schools in Switzerland.

An apprentice is employed in a training company (all sorts of industry from small to large size) and once or twice per week he/she goes to vocational shool.

The training company is responsible for apprentices "on the job" training and practical trade related teaching, whereas the vocational school imparts theortecical knowledge (trade specific and general knowledge) to the apprentices.

The apprentice gets a small salary from the training company which is much smaller than that for a full employed worker. More than 200 trades are offered for apprenticeship education in Switzerland.

The Swiss apprentice education system is very old and has its origins at the formation of the first federal union of 5 states in 1291. At that time already, various trades of several Swiss states

started forming guilds, called “Zünfte” (singular: “Zunft”) in German. These guilds were politically involved and very powerful: To name an example, in Zurich, there existed a guild constitution (“Zunftverfassung”) until 1798. The guilds were also regulating the trade apprenticeship system for training and education of trade skills.
Later on, national regulations for vocational education were introduced, and a responsible ministry was formed. Nowadays in Switzerland, both trade associations/businesses and the government (confederation and “cantons”) are responsible for the vocational education according to the latest state of knowledge.

http://www.joshi-foundation.ch/swiss-dual-system.html

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In Switzerland, two-thirds of all students coming out of compulsory education decide to start their careers with vocational education and training (VET). One of the VET programs is doing an apprenticeship, which usually takes three to four years and combines classes at a vocational school with on-the-job training at a host company, where apprentices are employed. Once they have graduated, apprentices receive a federal VET diploma, which is recognized by employers all across Switzerland. During the program, the host company pays the apprentice a salary, which increases with each completed year. The concept of earning money while still getting an education is a big incentive for future apprentices. Salaries vary for each occupational field and are lower than what regular employees would earn. Even so, the amount represents compensation for their performance and allows apprentices to have their own disposable income at a very young age. The Swiss vocational and professional education and training system is managed as a public-private partnership: the professional organizations, the cantons (state governments) and the Swiss Confederation (federal government) have found ways to jointly define curricula, skill sets and standards for occupations throughout the country. The most important partner is the private sector. It is the companies that employ apprentices and provide on-the-job education and training. Trade associations are responsible for defining the industry-wide skill standards and training content. Therefore the VET system is very labor market-driven and based on the needs of the different industries, while the federal government ensures quality control and recognition.

The goal of vocational education and training is to educate apprentices in a broad range of skills they need to be successful in their future careers. Once apprentices have graduated from their program, they are immediately prepared to work, and employers are aware of the abilities they bring with them. A broad skill set combined with a nationally recognized diploma offers young professionals the chance to work for potentially any company. As a talent pool, apprentices are a great benefit to companies, decreasing their recruitment costs. Another important feature of the Swiss educational system is its high degree of permeability. The system provides career prospects for everyone and delivers a basis for lifelong learning. For example, after apprentices graduate,

they can earn a university degree or take additional classes (leading to further certifications) at a professional college. There are plenty of options and pathways to continue one's education or even to change one's professional field.

The costs of the vocational education and training system are borne by: the Swiss Confederation (federal government), the cantons (states) and the professional organizations (companies, social partners, trade associations, and so forth). The professional organizations cover the costs for training and the salaries of the apprentices and pay for intercompany courses. The cantons fund the vocational schools and career guidance services and train apprenticeship trainers. The Swiss Confederation is responsible for quality control, comparability, transparency and further development of the system as a whole.

The Challenges Facing the System Today Swiss vocational education and training is very well organized and a successful part of the Swiss educational system in many respects. However, some challenges still remain. On the one hand, the needs of the labor market change constantly and so does the demand for new skills. On the other hand, there are technological changes and global trends that influence the structure of a market and thereby affect the demand for talented young people. It is a challenge to keep up with the changes in the marketplace and to ensure that the skill standards and curricula are always upto-date. Additionally, societal changes influence the popularity of the VET system. For example, some students might perceive college and a university degree as more prestigious. Other students might not have been born and raised in Switzerland and are therefore less familiar with the concept of vocational education and training. In both situations, clarifications about the functioning of the system and the viability of VET as a career pathway are necessary. Furthermore, there are certain occupations that face more gender and equality biases than others: Switzerland, too, needs more women in IT and other STEM fields. Last but not least, since internationalization and mobility in the labor market are increasing, more and more foreign companies are establishing branches in Switzerland. Some of those companies firApprenticeships in Switzerland generally target young adults who are about to graduate from high school. The timeline to the right shows that students start thinking about their future careers at the young age of 14. With regard to career choice, students can benefit from career counseling and other career guidance services to learn about their options and find out about their professional interests. That is the point when students decide whether they want to continue with general education or whether they would like to pursue the VET pathway. If they choose the latter, one of the options is to start applying for apprenticeship positions with companies, which is a competitive process. Upon graduation from high school—roughly at age 16—the students who have opted for an apprenticeship start their three- or four-year programs. Since apprenticeships are organized in a dual-track approach, apprentices spend one or two days per week at a vocational school, where they learn technical, methodological and social skills, and the remaining days at the host company, acquiring practical knowhow through on-the-job training. At the end of the training period,

apprentices have to take a final exam. If they are successful, they graduate with a federal VET diploma, which is recognized and respected everywhere in Switzerland. It is the “entry ticket” into the job market and allows young professionals to kickstart their careers without any student debt and with hands-on work experience. In addition, the VET diploma is recognized by various institutions of higher education, where young professionals can pursue further education if they want to. VET diploma holders are highly sought after by employers because these young professionals are trained in a large variety of skills and can be tasked with versatile jobs and responsibilities. Moreover, companies have realized that new generations of qualified workers can have a positive impact on their competitiveness and innovation capacityst need to be convinced of the VET system’s advantages.

https://www.eda.admin.ch/dam/countries/countries-content/united-states-of-america/en/Apprenticeship%20Brochure%20160329%20Web.pdf

3 Concluding remarks

As can be seen in this review of several European Union countries, the models of dual education differ from country to country. Comparative analysis of presented models of dual education show, that there is no single European model of dual education, neither when it comes to legislation, nor when it comes to internal competencies for the organization of this model of education.

In some states, the authority to regulate the dual model of education is given to the regions or federal units or regions, while in other states it is the responsibility of the central government.

There are also differences in the level of competence of the universities themselves, which have more or less independence in creating dual models of studies. So for example in Italy, each university is called to define its own set of strategies and plans in this field. In the UK, for example, academic qualifications are not national awards but granted by individual institutions.

It is noticeable that the creation of dual models of studies in European countries depends on the needs of the labor market and industry. Thus, these forms of study appear as a kind of joint activities of the public and private sectors, which provides a number of benefits.

When it comes to the achieved level of organization of dual models of studies, it is noticeable that there are large differences from country to country. It is obvious that every country finds or tries to find an appropriate model that will adequately respond to the needs of the labor market, which is the main impetus for this type of study. In this sense, it is to be expected that the existing models of dual education will continue to adapt to the changing needs of the overall social and economic development. This is one of the reasons why some countries, have left room for higher education institutions for greater or lesser independence in creating dual study programs.

Given that dual models of education are a response to the needs of the labor market, it is important to note once again the fact, that it models varies from region to region or, in some countries, or from one federal unit to another. This means that in the process of creating and introducing a dual model of study, the specifics of certain parts of the country must be taken into account, which are conditioned by different levels of economic development, different development directions, and finally different labor market needs in different parts of the same country.

Taking all these aspects into account is very important. Because, as this analysis indicates, there is no universal model of dual education. Each country must respect its own specific needs and, in accordance with them, approach in the creation and introduction of such a model, which, in the countries to which it is applied, has proven to be extremely successful.

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